



# Non-Motorized Boating in California

March 2009

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The Department of Boating and Waterways would like to recognize and express appreciation to Mike Ammon, DBW Boating Trails Program manager, and Wendy Pratt from NewPoint Group for their tireless work in developing and completing this important study.

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# Executive Summary

# Executive Summary

The California Department of Boating and Waterways (DBW) commissioned this research study of non-motorized boating in California to (1) understand how many, and what types, of non-motorized boats there are in California; (2) understand how economically important non-motorized boating is to California; and (3) potentially plan future facilities to meet the needs of California's non-motorized boaters. This research study of non-motorized boating in California affords a better understanding of who participates in non-motorized boating; the types of boats they use; where and why they boat; and the facilities they need. The information in this report may help DBW, waterway managers throughout the State, and non-motorized boating service providers, to further support and promote non-motorized boating in California.

Non-motorized boating is a growing, dynamic, and diverse element of outdoor recreation in California, which is home to approximately 1.7 million non-motorized boats (2006) – almost twice as many boats as the 963,758 registered (primarily motorized) boats in the State (as of December 31, 2005). Most non-motorized boats are owned by California households, although there are a number of non-motorized boats in commercial and institutional fleets, as well as owned by clubs.

**Table ES.1**, on the next page, provides the estimated number of non-motorized boats in California. There are an estimated 969,707 households in California that own non-motorized boats. Many households own more than one boat, with the average number of non-motorized boats per household estimated at 1.75.

**Table ES.2**, following Table ES.1, provides the estimated total number of non-motorized boats in California, by boat type. Prior to starting this study, it was important to carefully define what was, and what was not, included within the definition of non-motorized boats in California:

For purposes of this study, "non-motorized boat" means any boat not currently registered with a vessel registration (CF) number from the California Department of Motor Vehicles. This non-motorized boat definition includes: (1) boats propelled by paddles or oars (and usually without a motor), such as canoes, kayaks, inflatable boats and rafts, rowing boats including row boats, shells, sculls, dories, and driftboats), and other types of manually propelled boats; (2) small sailboats, 8 feet in length or shorter (and usually without a motor); and (3) sailboards and kiteboards. Non-motorized boats do not include "toy like" blow-up rafts and other non-durable water toys, nor do non-motorized boats include inner tubes or fisherman float tubes (without oars). Finally, non-motorized boats do not include normal surfboards, beach boogie boards, or riverboards.



**Table ES.1**  
**Estimated Number of Non-Motorized Boats in California by Category (2006)**

Category	Number of Boats by Category	Percent of Total
1. Privately Owned	1,696,987	99.0%
2. Commercial and Institutional Owned	15,062	0.9%
3. Club Owned	2,700	0.1%
<b>Total</b>	<b>1,714,749</b>	<b>100.0%</b>

**Table ES.2**  
**Estimated Number of Non-Motorized Boats by Boat Type in California (2006)**

Boat Type	Number of Boats by Boat Type	Percent of Total
1. Inflatable*	711,509	41.5%
2. Kayak	543,251	31.7%
3. Canoe	191,505	11.2%
4. Rowing Boat	160,735	9.4%
5. Sailboard/Kiteboard	55,969	3.2%
6. Small Sailboat**	42,770	2.5%
7. Other	9,010	0.5%
<b>Total</b>	<b>1,714,749</b>	<b>100.0%</b>

\* For purposes of this study, the “inflatable” category includes inflatable rafts, catarafts, and transoms. Inflatable kayaks are included in the “kayak” category.

\*\* Many boaters consider any sailboat that they store at home, and load on their car, as a “small sailboat”, even if the sailboat is longer than 8 feet in length. This estimate of small sailboats includes a significant number of these longer small sailboats.

There are significant ambiguities in the precise definition of non-motorized boats. Carefully defining non-motorized boats served to reduce these ambiguities. However, without legal clarification at the federal and/or state levels, the definition of non-motorized boats will continue to remain ambiguous. Because precisely defining non-motorized boats is so challenging, there likely is (1) some counting of vessels in this study that were not within our definition of non-motorized boats, as well as (2) some undercounting of vessels that should have been within the study definition. Therefore, study counting errors likely could be both positive and negative.

To provide a clearer definition of non-motorized boats in the future, it might be necessary to list specific types, and perhaps even brands, of vessels, particularly in the most ambiguous categories, such as inflatable boats. This would obviously need to be a dynamic list, as manufacturers are continuously entering and exiting the marketplace. For purposes of this study, we accepted that there was considerable ambiguity in the definition of non-motorized boats, and thus some uncertainty in the precise number of non-motorized boats, particularly by boat type. However, this acceptance did not preclude provision of best estimates for the number of non-motorized boats in California, at the level provided in this report.

Table ES.2 illustrates that inflatable rafts and boats were the most common type of non-motorized boat in California, followed by kayaks. There were significantly more inflatable boats and kayaks than the other types of non-motorized boats included in this report: canoes, rowing boats, small sailboats, sailboards (windsurfers), kiteboards, and other non-motorized boats such as paddleboats and dragon boats.

**Table ES.3**, on the next page, provides the estimated total number of kayaks, by five types. There are many types of kayaks, and the relatively new recreational, or sit-on-top kayaks, have recently become very popular, particularly among new boaters. Sea kayaks, whitewater kayaks, inflatable kayaks, and any number of specialty kayaks (fishing, racing, surf, scuba, etc.) made up about one-half of the total number of regularly used kayaks.

**Table ES.3**  
**Estimated Number of Kayaks by**  
**Kayak Type in California (2006)**

Kayak Type	Number of Kayaks by Kayak Type	Percent of Total
1. Recreational Kayak	241,993	44.6%
2. Sea/Touring Kayak	134,070	24.7%
3. Inflatable Kayak*	75,561	13.9%
4. Whitewater Kayak	55,545	10.2%
5. Other Kayak	36,082	6.6%
<b>Total</b>	<b>543,251</b>	<b>100.0%</b>

\* There is some ambiguity within kayak definitions, as inflatable kayaks may be used for recreational paddling, touring, and whitewater paddling.

Table ES.2 and Table ES.3 provide estimates for the total number of non-motorized boats in California, by boat type. However, almost one-third of non-motorized boats in the State were not used regularly. In order to focus on non-motorized boats that Californian’s utilized most frequently on State waterways, **Table ES.4**, below, provides estimates of non-motorized boats, by boat type, for only those boats that were regularly used by California boat owners, or were in commercial, institutional, or club fleets.

Regular non-motorized boat use for boat owners was defined, for purposes of this study, as boats owned by boat owners that utilized their non-motorized boat(s) five (5) or more days per year. The study defined two additional categories of non-motorized boat owners, “infrequent” boaters, defined as non-motorized boat owners that utilized their non-motorized boats between one and four days per year, and “inactive” non-motorized boat owners, defined as non-motorized boat owners that did not utilize their boat(s) in the last five years. For the latter two boat use categories, Table ES.4 provides only the total number of non-motorized boats.

Because they are based on a smaller number of survey responses, the boat utilization estimates provided in Table ES.4 are less statistically accurate than the overall boat type estimates provided in Table ES.2. However, these estimates of regularly used non-motorized boats provide reasonable measures of the relative number of regularly used boats, by boat type, particularly for kayaks and inflatable boats.

**Table ES.4**  
**Estimated Number of Non-Motorized Boats by Boat Type and Utilization Level in California (2006)**

Boat Type	Number of Boats by Boat Type	Percent of Total
a. Boats Utilized 5 Days, or More, per Year	1,194,113	69.6%
1. Kayak	479,954	28.0%
2. Inflatable*	419,457	24.5%
3. Canoe	125,322	7.3%
4. Rowing Boat	94,553	5.5%
5. Sailboard/Kiteboard	44,939	2.6%
6. Small Sailboat**	20,878	1.2%
7. Other	9,010	0.5%
b. Boats Utilized 1 to 4 Days per Year	300,197	17.5%
c. Boats Not Utilized Within Last 5 Years	220,439	12.9%
<b>Total</b>	<b>1,714,749</b>	<b>100.0%</b>

\* For purposes of this study, the “inflatable” category includes inflatable rafts, catarafts, and transoms. Inflatable kayaks are included in the “kayak” category.

\*\* Many boaters consider any sailboat that they store at home, and load on their car, as a “small sailboat”, even if the sailboat is longer than 8 feet in length. This estimate of small sailboats includes a significant number of these longer small sailboats.

**Table ES.5**  
**Estimated Number of Regularly Used Kayaks**  
**by Kayak Type, Kayaks Utilized 5 Days or More**  
**per Year in California (2006)**

Category of Kayaks	Total Kayaks by Kayak Type	Percent of Total
1. Recreational Kayak	208,940	43.5%
2. Sea/Touring Kayak	123,074	25.7%
3. Inflatable Kayak*	70,047	14.6%
4. Whitewater Kayak	50,055	10.4%
5. Other Kayaks	27,838	5.8%
Total	479,954	100.0%

\* There is some ambiguity within kayak definitions, as inflatable kayaks may be used for recreational paddling, touring, and whitewater paddling.

Among regularly used non-motorized boats, kayaks were the most common type of non-motorized boat in California, followed by inflatable boats. In comparing Table ES.2 and Table ES.4, one can see that 292,052 inflatable boats (711,509 minus 419,457) were not regularly used. By comparison, “only” 63,297 kayaks (543,251 minus 479,954) were not regularly used. These “not regularly used” boats fell within either the “Boats Utilized 1 to 4 Days per Year” or “Boats Not Utilized Within Last 5 Years” categories in Table ES.4.

**Table ES.5**, above, provides the estimated number of kayaks, by five types, for regularly used kayaks. The proportion of kayaks, by type, that were regularly used is very similar to the proportion of kayaks, by type, overall.

This study of non-motorized boating in California focused on boat ownership, congruent with previous DBW studies of motorized boats. However, as the study progressed, it became apparent that for non-motorized boating, participation was another key metric that needed to be assessed. Thus, while the study results primarily focus on non-motorized boat ownership, the study also evaluated the number of participants, and number of days of participation. The participant,

and participation day, results for non-motorized boat owners are less statistically reliable than the statewide number of owned non-motorized boat estimates, but they do provide reasonable estimates at the statewide level, and representative relative allocations between boat types and regions.

An estimated 2.5 million Californians participated in non-motorized boating in 2006, accounting for 8.2 percent of the State’s population, age 12 and over. The vast majority of these participants were from non-motorized boat-owning households, although commercial/institutional and club participants were also significant components of non-motorized boating participation. **Table ES.6**, on the next page, provides the estimated number of non-motorized boating participants by type.

**Table ES.7**, following Table ES.6, provides estimates of total non-motorized boating participation by boat type (for regularly used boats). Total participants for kayaks and inflatable rafts were very close, with each at just over 30 percent of total participants. The participant data by boat type is conservative because it does not take into account that many non-motorized boaters participated with more than one boat type. In Table ES.7, each of the 1.9 million non-motorized boat owning participants was counted only once, and assigned to only one boat type based on the proportion of utilized boats, by type. Thus, the actual number of 2006 boat owning participants for any particular boat type was likely higher than these estimates.

Non-motorized boaters encompass a wide range of participants: (1) those that participate in non-motorized boating through rentals, classes, guided trips, or clubs; (2) those that own, but rarely use, their non-motorized boats; (3) those that participate in non-motorized boating several times a year as a family recreational activity; (4) those for whom non-motorized boating is a regular weekend and vacation avocation; and (5) those that participate in non-motorized boating almost daily as a form of exercise.

**Table ES.6**  
**Estimated Number of Non-Motorized Boating Participants by Participant Type in California (2006)**

Participant Type	Number of Participants by Participant Type	Percent of Total
1. Boat-Owning Participant	1,917,503	77.0%
2. Guided Trip Participant	243,827	9.8%
3. Rental Participant	208,902	8.4%
4. Instruction Participant	87,093	3.5%
5. Club Participant	33,000	1.3%
<b>Total</b>	<b>2,490,325</b>	<b>100.0%</b>

**Table ES.7**  
**Estimated Number of Non-Motorized Boating Participants by Boat Type in California (2006)**

Boat Type	Total Participants*	Percent of Total
a. Boats Utilized 5 Days or More per Year	2,101,072	84.4%
1. Kayak	776,208	31.2%
2. Inflatable	813,501	32.7%
3. Canoe	224,155	9.0%
4. Rowing Boat	131,967	5.3%
5. Sailboard/Kiteboard	71,881	2.9%
6. Small Sailboat	55,137	2.2%
7. Other	28,223	1.1%
b. Boats Utilized 1 to 4 Days per Year	389,253	15.6%
<b>Total</b>	<b>2,490,325</b>	<b>100.0%</b>

\* Total participants by boat type were adjusted to match the total number of participants overall. As a result, these estimates assume that each participant utilized only one boat type. Because some participants used multiple boat types, these are conservative estimates of boat type participation.

For Californians that own a non-motorized boat, the average number of participation days per year was 24. The majority of those that do participate in non-motorized boating expect to either keep participating at the same levels, or increase participation, over the next five years.

The total estimated non-motorized boating participation days in 2006 is provided in **Table ES.8**, on the next page. **Table ES.9**, following Table ES.8, provides estimates for the total number of participation days by boat type (for regularly used boats). For boat owners, these estimates are based on average annual

participation days by most-used boat type, and are representative of the relative split of user days by boat type for regularly used boats. Kayaks represented almost one-half of total non-motorized boating participation days in 2006, followed by inflatable boats.

Non-motorized boaters use many different types of waterways, ranging from the Pacific Ocean to small local ponds. California has numerous harbors, lakes, reservoirs, and rivers that are appropriate for all types of non-motorized boating activities. The top five reasons why non-motorized boaters choose to boat at a particular waterway are: (1) because it

**Table ES.8**  
**Estimated Number of Non-Motorized Boating Participation Days by Participant Type in California (2006)**

Participant Type	Number of Days by Participant Type	Percent of Total
1. Boat-Owning Participant	45,905,022	94.6%
2. Club Participant	1,870,000	3.9%
3. Guided Trip, Rental, and Instruction Participant	726,472	1.5%
<b>Total</b>	<b>48,501,494</b>	<b>100.0%</b>

**Table ES.9**  
**Estimated Number of Non-Motorized Boating Participation Days by Boat Type in California (2006)**

Boat Type	Total Participation Days	Percent of Total
a. Boats Utilized 5 Days or More per Year	47,619,582	98.2%
1. Kayak	21,516,355	44.4%
2. Inflatable	13,757,628	28.3%
3. Canoe	5,093,451	10.5%
4. Rowing Boat	3,873,109	8.0%
5. Sailboard/Kiteboard	586,338	1.2%
6. Small Sailboat	1,975,017	4.1%
7. Other	817,684	1.7%
b. Boats Utilized 1 to 4 Days per Year	881,912	1.8%
<b>Total</b>	<b>48,501,494</b>	<b>100.0%</b>

was close to home or convenient; (2) to gain access to another activity such as fishing; (3) because it was not crowded; (4) because of the facilities at the waterway (parking, restrooms, etc.); and (5) for particular features or destinations at the waterway such as beaches and shoreline.

Non-motorized boaters in California are from all regions of the State, and they participate in many types of boating activities. In general, there are relatively more non-motorized boating participants in rural regions than in urban regions. Certain types of non-motorized boating activities are more predominant in some regions than others, as non-motorized boating is typically limited by waterways.

Whitewater kayaking and rafting, both among boat owners and through guided trips, are popular

on rivers in the Central Valley, Sacramento Basin, and Northern Interior regions. Non-motorized boaters use their inflatable boats, canoes, and recreational kayaks on sheltered harbors, lakes, and calm rivers within all of the State's regions. Canoe rentals are popular in the North Coast region, while a large number of boaters in the Sacramento Basin and Central Valley regions use kayaks and inflatable boats on the region's many lakes. Most sea kayaking, sailing, sailboarding, and kiteboarding takes place in the San Francisco Bay Area, South Coast, and San Diego regions on ocean harbors and bays.

One of the attractions of non-motorized boating is that it does not necessarily require a significant investment in order to participate. Non-motorized boating contributed \$1.7 billion to the California economy in 2006. This contribution came from four

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major categories: (1) non-motorized boat owner annual expenditures on items such as boats, supplies, and apparel; (2) non-motorized boat owner trip expenditures on items such as fuel (to drive to the boating location), food, entrance fees, and lodging; (3) consumer expenditures on non-motorized boat rentals, instruction, and guided trips; and (4) the sales output from non-motorized boat manufacturers located in California. The \$1.7 billion reflected an economic contribution of approximately \$1,000 per non-motorized boat in 2006.

The economic contribution of non-motorized boating does not represent the full value, or benefit, of non-motorized boating to Californians. Participants in non-motorized boating gain significant intrinsic value from the activity.

The time and travel costs that consumers incur to enjoy a recreational outing can be used as a proxy to estimate the “price” or intrinsic value of recreation. Based on a travel cost methodology, the mid-range calculated recreational user value of non-motorized boating in California was \$36.09 per person, per day in 2006.

The \$36.09 per person, per day, recreational user value, applied to the total number of participation days for California non-motorized boating in 2006, results in a statewide recreational user value for non-motorized boating of \$1.75 billion. This \$1.75 billion user value is slightly higher than the economic contribution of non-motorized boating of \$1.7 billion.

The non-motorized boating per person, per day, recreational user value of \$36.09 is larger than the equivalent value for motorized boating at \$17.89 in 2000.<sup>a</sup> Thus, while non-motorized boaters may have less economic impact than motorized boaters, they place a higher intrinsic value on their activity.

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<sup>a</sup> From Volume V of the *California Boating Facilities Needs Assessment (BNA), Boating Economic Assessment and Demand Projections*.

A growing number of Californians recognize the recreational value of non-motorized boating. Over the last four years, an estimated 135,759 California households joined the ranks of non-motorized boating participants. This estimate reflects an average annual compound rate of growth of 3.84 percent for non-motorized boating participation over the last four years (2002 to 2006). Inflatable boats or rafts, and plastic recreational kayaks, are the most common boat types for new participants. Most new non-motorized boating participants take up this activity either as young adults, or in their 40s and 50s.

The number of new non-motorized boaters in California is expected to continue to increase over the next several years. Projecting forward, the number of non-motorized boat-owning households is expected to increase to between 1.044 million to 1.151 million, by 2010. The number of non-motorized boating participants in those households is projected to range from 2.064 million to 2.274 million, by 2010.

This increase in non-motorized boaters will be due, in part, to the continued new participation among Baby Boomers as they near, and enter, retirement. In addition, many individuals in another large age group cohort, children of Baby Boomers, also are starting to participate in non-motorized boating as young adults.

As non-motorized boating continues to grow in popularity, pressure on California’s waterways and facilities also will continue. This demand for non-motorized boating facilities parallels a similar pressure on all of California’s park and recreation facilities.

Facility needs for non-motorized boating are significantly less than for motorized boating. The top five facility needs requested by non-motorized boaters were: (1) improved access to the water; (2) restrooms; (3) parking; (4) maintained water levels or releases; and (5) floats or launch ramps.

Non-motorized boaters generally prefer “low-impact” facilities. Typically, non-motorized boating

participants bring their boats to the water on top of, or in, their automobiles. The most important non-motorized boating requirement is access points to the water. For any given access point, the key facility needs for non-motorized boating include: (1) a place to unload vessels fairly close to the water; (2) a safe place to park; (3) restrooms; (4) a trail or access to the water; and (5) a beach, grassy area, or dock close to the water level from which to launch. **Table ES.10**, on the next page, summarizes the general facility needs and issues for eleven types of non-motorized boats.

As the population of non-motorized boaters has increased, so has the potential for conflicts between various user groups, including non-motorized boaters, motorized boaters, anglers, landowners, and other recreationists. Waterway management for non-motorized boating is often inconsistent, and has not always kept pace with the growth in new non-motorized boating activities.

The growth in popularity of non-motorized boating has highlighted the high degree of ambiguity and confusion in regards to laws and regulations applicable to non-motorized boaters. The recent growth in the non-motorized boating activity has made the need for law and regulation consistency and clarification more prominent. For example, it is difficult to define exactly what is a non-motorized boat, and then even more difficult to determine what boating safety laws

and regulations (for example, life jacket requirements) apply.

There will be growing pressure on California's waterway managers, and DBW, to focus on the diverse needs and issues related to non-motorized boating. This may not be a simple task.

Diversity is the common thread among all aspects of non-motorized boating. There is no universal type of boat, boater, location, or waterway that characterizes non-motorized boating. Furthermore, California's waterways are managed by many different Federal, State, county, and city agencies, as well as water and irrigation districts. Many waterways are managed by more than one government entity, and often land along a waterway is privately owned. Developing a consistent approach to non-motorized boating in California will require a high degree of collaboration among the various government entities; boating organizations; non-motorized boating commercial and institutional entities; and non-motorized boaters.

Improving opportunities for non-motorized boating participation in California is a challenge worth undertaking. With approximately 2.5 million total California participants (includes boat-owning, guided trip, rental, instruction, and club participants), non-motorized boating makes up an important aspect of California's recreation framework and active outdoor lifestyle.

*We would like to thank the many individuals and organizations that provided input to this report. This report would not have been possible without contributions from the literally thousands of individuals and organizations involved in non-motorized boating that completed surveys, provided telephone interviews, and participated in the special interest group meetings. We would also like to thank Quantum Market Research, of Oakland, California, for undertaking the challenging task of the statewide and regional random telephone surveys.*

**Table ES.10**  
**Overview of Key Facility Needs by Non-Motorized Boat Types in California (2006)**

Boat Type	General Facility Needs and Issues
1. Canoes	<ul style="list-style-type: none"> <li>■ Gradual slope or long steps to the water (i.e. not steep)</li> <li>■ Flat place to launch from, close to water level (such as low freeboard dock)</li> <li>■ Parking and restrooms</li> </ul>
2. Outrigger canoes	<ul style="list-style-type: none"> <li>■ Storage for boats near water</li> <li>■ Access for getting on and off a beach</li> <li>■ Communication between boats and shore for emergencies</li> </ul>
3. Sea kayaks	<ul style="list-style-type: none"> <li>■ Gradual slope or long steps to the water (i.e. not steep)</li> <li>■ Flat place to launch from, close to water level (such as low freeboard dock)</li> <li>■ Parking and restrooms</li> <li>■ Security at parking areas</li> <li>■ Overnight parking for longer trips</li> </ul>
4. Whitewater kayaks and rafts	<ul style="list-style-type: none"> <li>■ Adequate water releases and flows</li> <li>■ Security at parking areas</li> <li>■ Access to water</li> <li>■ Parking and restrooms</li> </ul>
5. Recreational kayaks	<ul style="list-style-type: none"> <li>■ Gradual slope or long steps to the water (i.e. not steep)</li> <li>■ Flat place to launch from, close to water level (such as low freeboard dock)</li> <li>■ Parking and restrooms</li> </ul>
6. Inflatable boats (non-whitewater)	<ul style="list-style-type: none"> <li>■ Gradual slope or long steps to the water (i.e. not steep)</li> <li>■ Flat place to launch from, close to water level (such as low freeboard dock)</li> <li>■ Parking and restrooms</li> </ul>
7. Small sailboats	<ul style="list-style-type: none"> <li>■ No significant needs, as many small sailboats use yacht clubs to launch from</li> <li>■ Key need is a place to launch where they can carry, or wheel, boat on a dolly down to the water</li> </ul>
8. Rowing shells or sculls	<ul style="list-style-type: none"> <li>■ Storage for boats near water</li> <li>■ Lighted buoys for early morning rowing</li> <li>■ Shower facilities</li> <li>■ Parking and restrooms</li> </ul>
9. Sailboards	<ul style="list-style-type: none"> <li>■ Grassy or paved area for rigging</li> <li>■ Safe access to water in areas with adequate wind</li> <li>■ Parking and restrooms</li> </ul>
10. Kiteboards	<ul style="list-style-type: none"> <li>■ Adequate space for launching</li> <li>■ Areas with safe beach access</li> <li>■ Signage for kiteboarders and those on-shore regarding safety</li> <li>■ Parking and restrooms</li> </ul>
11. Dragon boats	<ul style="list-style-type: none"> <li>■ Storage for boats near water</li> <li>■ Lighted buoys for early morning rowing</li> <li>■ Shower facilities</li> <li>■ Parking and restrooms</li> </ul>

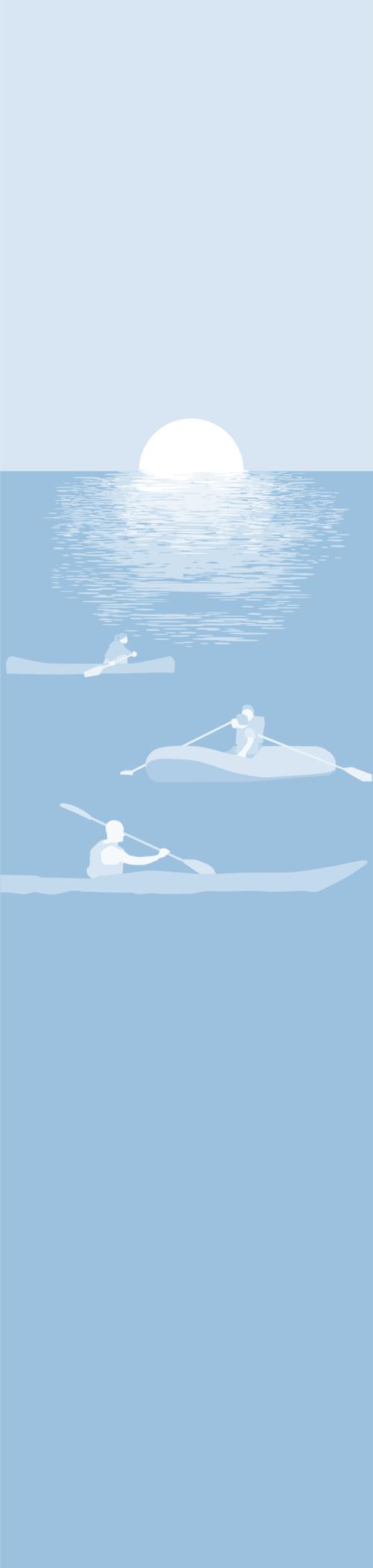
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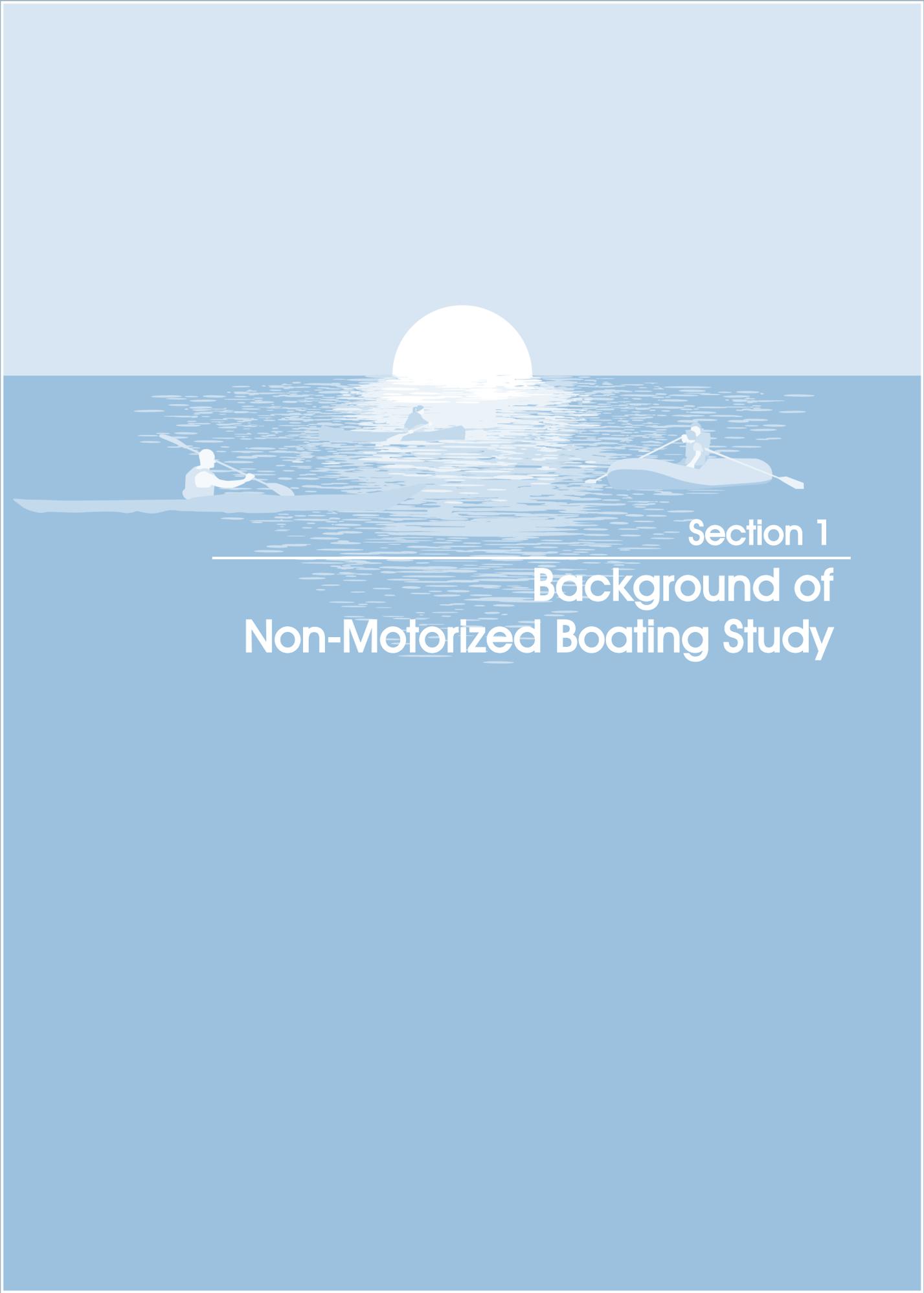


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Section 1

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# Background of Non-Motorized Boating Study

A vertical blue bar on the left side of the page contains a white illustration. At the top, a large white sun is partially obscured by the horizon. Below the sun, the water is depicted with white ripples. Three white silhouettes of people in kayaks are shown in the water, each holding a paddle. The kayakers are positioned at different depths, with the top one being the smallest and the bottom one the largest, creating a sense of perspective.

# 1. Background of Non-Motorized Boating Study

This final report is organized into nine (9) sections and seven (7) appendices. The report sections herein are as follows:

1. *Background of Non-Motorized Boating Study*
2. *Boats and Boaters for Non-Motorized Boating*
3. *Waterways and Facility Needs for Non-Motorized Boating*
4. *Annual Economic Impact of Non-Motorized Boating*
5. *Recreational User-Values of Non-Motorized Boating*
6. *History and Laws of Non-Motorized Boating*
7. *Safety Issues Related to Non-Motorized Boating*
8. *Health Benefits of Non-Motorized Boating*
9. *Trends of Non-Motorized Boating.*

Appendices, at the end of this report, contain the following seven (7) sections:

- A. *Non-Motorized Boat Clubs and Organizations*
- B. *Statewide and Regional Random Surveys*
- C. *Active-User Internet Survey*
- D. *Commercial and Institutional Survey*
- E. *Interest Group Meetings*
- F. *Summary of Existing Studies on Non-Motorized Boating*
- G. *Bibliography.*

\* \* \* \* \*

Section 1 provides (1) a description of the study purpose and scope; (2) a definition of non-motorized boats for purposes of this study; and (3) a description of the study methodology.

The section is organized as follows:

- A. *Study Purpose and Scope*
- B. *Study Definition for Non-Motorized Boats*
- C. *Study Methodology.*

## A. Study Purpose and Scope

The California Department of Boating and Waterways (DBW) was created by the California Legislature in 1957 to provide (1) safe and convenient public access to California's waterways and (2) leadership in promoting the public's right to safe, enjoyable, and environmentally sound recreational boating. DBW has a number of programs to support recreational boating in California, including: grants and loans for boating facilities;

funding for boating law enforcement; boating safety education; a non-motorized boating trails program; and aquatic weed management.

DBW has historically focused their efforts on *motorized* boating (including sailboats greater than eight feet in length). However, non-motorized boating has grown exponentially since DBW was established over fifty (50) years ago. Given this significant growth in non-motorized boating, DBW has considered expanding their scope-of-services for non-motorized boating.

As DBW examined non-motorized boating more closely, it became clear that relatively little was known about the universe of non-motorized boating in California. In 2006, DBW commissioned this research study of non-motorized boating in California to help address the lack of information on the non-motorized boating subject matter.

This research study, conducted over twelve months during 2006 and 2007, examined many aspects of non-motorized boating in California – the number and types of boats; characteristics of boaters, facilities and waterways used by non-motorized boaters; the economic impact of non-motorized boating; the recreational user-value of non-motorized boating; non-motorized boating history, laws, and safety; and health issues related to non-motorized boating. The study examined non-motorized boating at the statewide level, and for each of the ten (10) DBW regions, shown in **Exhibit 2.1**, on page 2-7 in Section 2.

This report provides DBW with a new, and better, understanding of the social and economic benefits, as well as the needs and issues related to non-motorized boating in California. This study will help DBW to (1) understand how many, and what types, of non-motorized boats there are in California; (2) understand how economically important non-motorized boating is to California;

and (3) potentially plan future facilities to meet the needs of California's non-motorized boaters. Information in this report can be used by DBW as a planning tool, allowing DBW to better develop future facility programs, and to potentially allocate future funding for non-motorized boating activities.

## B. Study Definition for Non-Motorized Boats

It is important to carefully define what is, and what is not, included within the definition of non-motorized boats in California. Initially, this definition issue was important to ensure that all survey respondents were clear in their answers as to whether they had a “non-motorized boat”. In addition, it was important to our later analysis to precisely define what non-motorized boats we measured.

For purposes of this study, “non-motorized boat” means any boat not currently registered with a vessel registration (CF) number from the California Department of Motor Vehicles. This non-motorized boat definition includes: (1) boats propelled by paddles or oars (and usually without a motor), such as canoes, kayaks, inflatable boats and rafts, rowing boats (including row boats, shells, sculls, dories, and driftboats), and other types of manually propelled boats; (2) small sailboats, 8 feet in length or shorter (and usually without a motor); and (3) sailboards and kiteboards. Non-motorized boats do not include “toy like” blow-up rafts and other non-durable water toys, nor do non-motorized boats include inner tubes or fisherman float tubes (without oars). Finally, non-motorized boats do not include normal surfboards, beach boogie boards, or riverboards.

**Exhibit 1.1**, starting on page 1-3, describes seven (7) general categories of non-motorized boats. **Exhibit 1.2**, on page 1-6 illustrates some potential non-motorized boats that were *not* included in this study.

**Exhibit 1.1**  
**Descriptions and Examples of Non-Motorized Boats**

Boat	Description	Examples <sup>1</sup>
1. Canoe	<p>A relatively small, narrow boat, typically human powered, and typically pointed at both ends and open (although the back may be flat, and the canoe may be covered). Canoes are typically designed for one or two paddlers, and may hold additional passengers and/or gear. Paddlers sit, or kneel, facing forward, and usually use a single-blade paddle. Canoes can be made of a variety of materials, including wood, aluminum, and composites. There are a range of specialty canoes, including fishing and hunting canoes; outrigger canoes; whitewater canoes (often with a closed deck); and inflatable canoes.</p>	  
2. Kayak	<p>A small, human-powered boat, typically with a closed deck, and a cockpit covered by a spray skirt. Kayaks are propelled by a double-blade paddle, and are usually designed for one or two people, who sit facing forward. Kayaks are made from a wide range of materials (wood, cloth, fiberglass, and plastic). There are a number of specialized types of kayaks with varying shapes, sizes, and structures. Kayak types include whitewater, surf, sea, inflatable, fishing, crabbing, surfski, playboat, and scuba diving.</p>	  
3. Inflatable Boat and Raft	<p>A group of inflatable vessels, originally made of rubber, and now typically made of layers of rubber and/or plastic composites. Inflatable boats consist of flexible tubes, typically with a flat floor. Cataracts consist of two or more pontoons, held together by a frame for seating and storage. Transoms typically have a solid stern, sometimes used to attach a motor. Rafts typically are oblong, with flexible tubing around the entire circumference.</p>	

Exhibit 1.1  
 Descriptions and Examples of Non-Motorized Boats (continued)

Boat	Description	Examples <sup>1</sup>
4. Small Sailboat	These vessels must be eight feet in length, or shorter. There are three “one-design” models that are raced; the El Toro, the Optimist, and the Sabot (including the Naples Sabot). There are specific design specifications for each of these three boats. For example, the El Toro is 7 feet, 11 inches in length, has a beam of 3 feet, 10 inches, has a sail area of 49 square feet, and a hull-only weight of 60 pounds. The Optimist is 7 feet, 7 inches in length. The Naples Sabot has similar unique design specifications.	
5. Row Boat, Dory, or Driftboat	A relatively wide, flat-bottomed boat, typically propelled by two oars resting in pivots. Most row boats are propelled facing backwards, although river dories are propelled facing forwards. These boats were originally made from wood, although they are now also made of fiberglass and aluminum.	
5. Rowing Shell or Scull	A specialized type of rowing boat, used for competition and recreation. A rowing shell is long, and narrow, propelled using oars, attached at oarlocks. Boats are designed for one, two, four, or eight rowers. When the rower uses two oars, it is referred to as a scull, and when a rower uses one oar, it is referred to as a sweep. Boats are typically directed by a coxswain, who sits in the stern, steers the boat, and motivates the rowers. These boats were originally made of wood, and are now made of composites.	
6. Sailboard or Windsurfer	A hand-held sail and rig attached to a board with a universal joint, operated by standing on the board. Technically, defined as a sail propelled vessel with no freeboard and equipped with a swivel mounted mast not secured to a hull by guys or stays.	

Boat	Description	Examples <sup>1</sup>
6. Kiteboard or Kitesurfer	<p>A power kite connected to a harness and control bar. The harness is worn by the rider, who stands on a small surfboard, wakeboard, or kiteboard (with footstraps). Kite sizes and shapes vary depending on wind conditions, and skill of the kiteboarder.</p>	
7. Dragon Boat	<p>A wood and fiberglass canoe-like boat, wide enough for two people and typically about 45 feet long. Usually holds 20 paddlers, a steersman, and a drummer. Paddlers face forward, and paddle in unison. The boat has a dragon's head at the bow, and dragon's tail at the stern.</p>	
7. Paddleboat or Pedal Boat	<p>A small rectangular plastic boat, propelled by bicycle-style pedals attached to a paddle wheel. Usually designed for two pedalers plus passengers. Typically used on small lakes and ponds for recreation.</p>	
7. Stand Up Paddle Surfing	<p>A form of surfing, using a specialized long surfboard (typically 12 feet in length) and a carbon fiber paddle eight to ten inches longer than the person paddling. The paddler stands on the surfboard and propels themselves with the paddle and in some cases also riding waves. This activity originated centuries ago among Hawaiians and Polynesians, and has recently begun to gain popularity in the United States, primarily in Hawaii and California. Stand-up paddle surfing can take place in surf, or in calm bodies of water.</p>	

# 1. Background of Non-Motorized Boating Study

## Exhibit 1.2

### Examples of "Boats" NOT included in the Non-Motorized Boating Study<sup>2</sup>

		
Surfboards	Riverboards	
		
Inner Tubes	Toy Rafts	Float Tubes

---

There are significant ambiguities in the precise definition of non-motorized boats. Carefully defining non-motorized boats served to reduce these ambiguities. However, without legal clarification at the federal and/or state levels, the definition of non-motorized boats will continue to remain ambiguous. Because precisely defining non-motorized boats is so challenging, there likely is (1) some counting of vessels in this study that were not within our definition of non-motorized boats, as well as (2) some undercounting of vessels that should have been within the study definition. Therefore, study counting errors likely could be both positive and negative.

To provide a clearer definition of non-motorized boats in the future, it might be necessary to list specific types, and perhaps even brands, of vessels, particularly in the most ambiguous categories, such as inflatable boats. This would obviously need to be a dynamic list, as manufacturers are continuously entering and exiting the marketplace. For purposes of this study, we accepted that there was considerable ambiguity in the definition of non-motorized boats, and thus some uncertainty in the precise number of non-motorized boats, particularly by boat type. However, this acceptance did not preclude provision of best estimates of the number of non-motorized boats in California, at the level provided in this report.

### C. Study Methodology

This study was the first of its kind in the United States. While prior United States studies have reviewed a particular aspect of non-motorized boating, such as national boating participation rates, or boating safety, there had been no other broad assessment of non-motorized boating in California, at the national level, or in any other state. As a result, this research study included a significant amount of

primary data-gathering, as well as reviewing numerous studies and reports that were completed on individual aspects of non-motorized boating.

This study methodology was designed to address several unique challenges. First, the study had to include all types of non-motorized boats, as defined above. While some non-motorized boat types may at first appear to be nominal, in a state the size of California, a subset of non-motorized boats may still represent a significant number of boats and boaters.

For the second study challenge, the various types of non-motorized boats were diverse, resulting in a wide range of boater characteristics, opinions, and facility needs. For example, the study could not simply identify the needs of whitewater kayakers, and then apply that to the other boating sectors – the study needed to identify the specific needs of different types of non-motorized boats.

The third study challenge was that within any particular type of non-motorized boat owners, there were at least two classes of users: casual and active. Casual users and active users had distinctly different attributes, interests, and needs. Casual users may own one or more non-motorized boats, but they use them only rarely, usually for recreational purposes. Active users may own many non-motorized boats, and they use their boats regularly.

A fourth, and final, study challenge was that the study needed to consider the myriad of ways in which Californians participate in non-motorized boating. These alternative means of participation included guided trips, rentals, institutional programs, and non-motorized boating classes.

To help address these many study challenges, and to meet information requests of DBW, the research study included three (3) primary data

surveys, thirteen (13) special interest group meetings, over forty (40) telephone interviews with experts, and a review of over one hundred (100) secondary references. Below, we briefly describe each of these approaches.

1. *Statewide and Regional Random Surveys* – A random telephone survey of 474 non-motorized boat owners included a random sample of 351 boat owners statewide, and between 25 and 87 random boat owners in each of the ten DBW regions. These random surveys included questions about non-motorized boat numbers and types; boating waterways; boating facilities; reasons for boating; boating safety; annual and trip boating expenditures; and boat user demographics. These random telephone surveys were conducted between November 2006 and April 2007, by Quantum Market Research, Inc. (Oakland, California).
2. *Active-User Internet Survey* – This non-random survey used essentially the same survey instrument as the random survey; however, this survey was placed on DBW web page. Respondents completed the survey online and submitted results directly to NewPoint Group. Non-motorized boating organizations throughout the State were informed of the survey, and asked to encourage their members to participate. This survey was conducted between December 2006 and February 2007, with 1,518 completed surveys.
3. *Commercial Business Survey* – This was an attempted census of commercial outfitters, rental companies, and retailers. A total of 112 commercial entities completed the survey. The purpose of this survey was to identify the number and types of non-motorized boats in California within the “commercial fleet”, to gather information on commercial activities for the economic impact analyses, and to identify facility needs and trends from a business operator’s perspective.
4. *Special Interest Group Meetings* – In order to obtain direct input from a variety of non-motorized boaters throughout the

State, the study included thirteen (13) special interest group meetings, which were held between May 2007 and July 2007. For the most part, these meetings were held during regularly scheduled non-motorized boating organization meetings. At each meeting, the research study team made a PowerPoint presentation summarizing (1) the scope and purpose of this study, (2) preliminary study results, and (3) questions for non-motorized boaters. A significant portion of each special interest group meeting was spent obtaining input from participants on non-motorized boating issues. At least one meeting was attempted to be held in each of the ten regions, as well as for each of the non-motorized boat types.

5. *Expert Interviews* – During the course of this study, the study team conducted interviews with over forty (40) experts on various non-motorized boating topics. These experts provided invaluable information on topics such as non-motorized boating accidents and safety; history of non-motorized boating; health impacts of non-motorized boating; river management; commercial boating permit participation data; and boating facility needs on specific waterways.
6. *Economic Impact Analysis* – The study included an economic modeling component in order to determine the economic impact of non-motorized boating in California, including the non-motorized boating contribution to Gross State Product (GSP), jobs, and tax revenues. The study utilized IMPLAN modeling from the Minnesota IMPLAN Group (MIG) to calculate the various economic impact components. Base data were obtained through the primary data surveys, and these data included consumer spending on (1) non-motorized boating trips, (2) guided trips, (3) rentals, (4) classes, (5) durable goods, and (6) services. The economic impact modeling determined direct, indirect, and induced impacts of non-motorized boating in the State.

7. *Secondary Research and Literature Reviews –*

The final component of the survey methodology included an extensive review of existing literature on non-motorized boating in the United States. A number of studies have assessed specific aspects of non-motorized boating, such as participation in recreational paddling

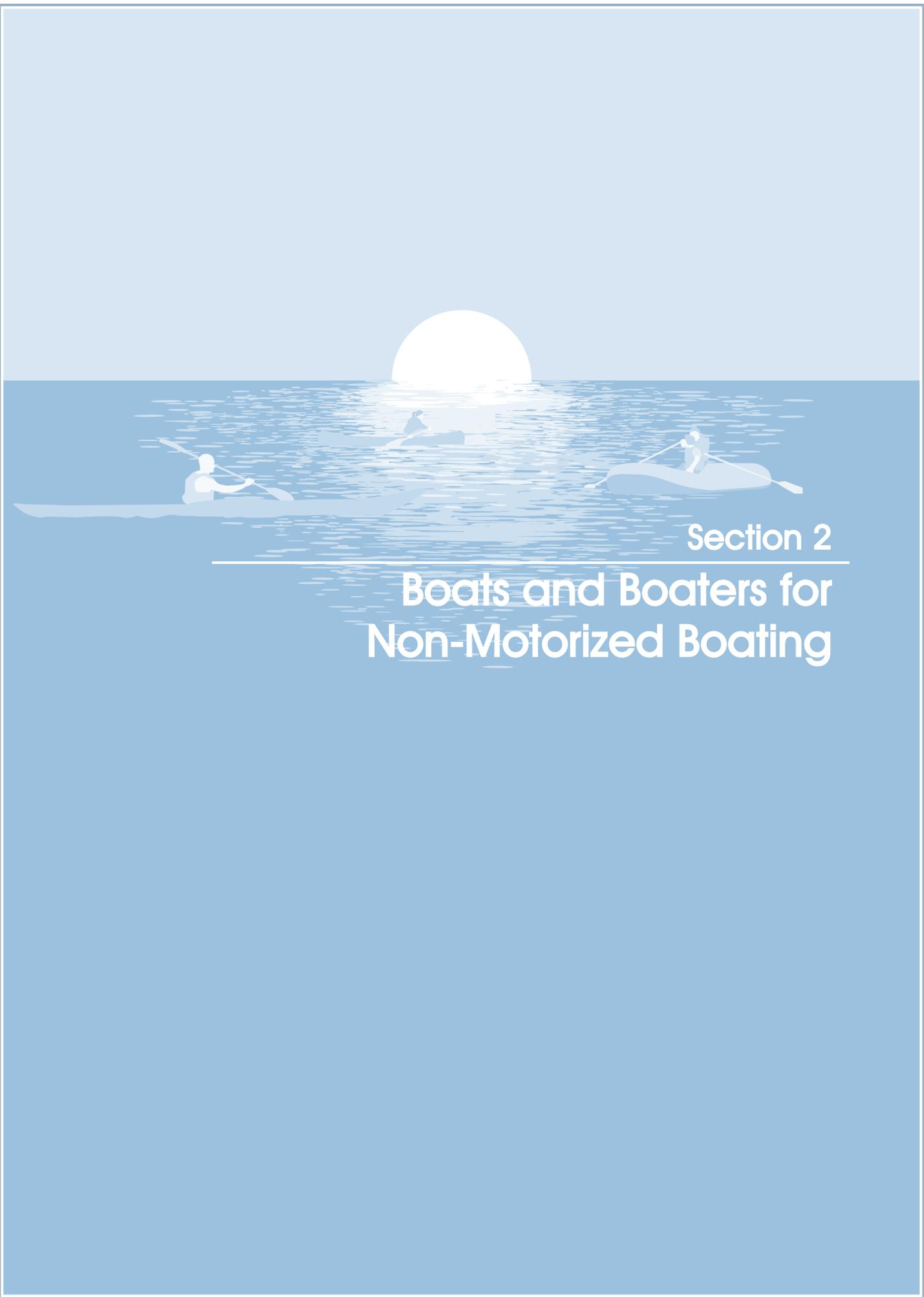
activities; safety of non-motorized boating; non-motorized boating accident data; non-motorized boating laws and regulations; and health impacts of boating recreational activities. The study team reviewed over one hundred (100) secondary literature documents and incorporated their relevant findings into this study report.



### Section 1 Endnotes

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- <sup>1</sup> The outrigger canoe picture is courtesy of Pale Kai Outrigger Club; the kiteboarding picture is from The San Francisco Bay Area Water Trail Plan, Bay Conservation and Development Commission, July 6, 2007; the small sailboat picture is courtesy of the Mission Bay Aquatic Center.
- <sup>2</sup> The riverboard picture is courtesy of El Dorado County; the float tube picture is courtesy of Fly Fishers of Davis.



Section 2

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# Boats and Boaters for Non-Motorized Boating

## 2. Boats and Boaters for Non-Motorized Boating

This section of the report examines the number of non-motorized boats in California, the number of non-motorized boating participants in California, and trends in non-motorized boating participation. The data and discussions herein draw on survey results from this study. Appendix B, Appendix C, and Appendix D, respectively, provide summaries of the statewide and regional random surveys, active-user survey, and commercial/institutional survey. Where there are sufficient reliable data, the report examines results by non-motorized boat type and region. There are three key sets of data on non-motorized boating: (1) number of non-motorized boats, (2) number of non-motorized boating participants, and (3) number of non-motorized boating participation days.

This section is organized as follows:

- A. *Number of Non-Motorized Boats in California*
- B. *Number of Non-Motorized Boating Participants in California*
- C. *Number of Non-Motorized Boating Participation Days in California.*

### A. Number of Non-Motorized Boats in California

The statewide, and regional, random telephone surveys provided statistically valid incidence rates of non-motorized boat-owning households at the 95 percent confidence level.<sup>a</sup> **Table 2.1**, on the next page, provides our 2006 estimate for the total number of non-motorized boats in California (1.71 million). This estimate is based on a statewide incidence rate of 7.84 percent of California households owning non-motorized boats, or 969,707 non-motorized boat-owning households, with an average of 1.75 boats per household. In addition to non-motorized boats owned by individuals, there are non-motorized boats owned by commercial and institutional entities that rent, provide instruction, or conduct guided trips, as well as club-owned non-motorized boats. As Table 2.1 illustrates, the vast majority of non-motorized boats in California are owned by individuals.

The estimated number of non-motorized boats in California is significantly higher than the number of registered, primarily motorized, boats in California. The California Department of Motor Vehicles (DMV) reports that as of December 31, 2005, there were 963,758 registered boats in California. This figure includes sailboats over eight feet in length, and some non-motorized boats; however, the vast majority of these boats are motorized.

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<sup>a</sup> The incidence rate is the percent of California households that own one, or more, non-motorized boats. The margin of error at the 95 percent confidence level for overall boat-owning households and subcategories vary, depending on the subcategory number of households surveyed. The overall statewide estimates are accurate at a margin of error of +/- 10 percent; however, regional estimates and boat-specific estimates have higher error rates. Appendix B provides a discussion of margins of error for the State, boat types, and for each region.



## 2. Boats and Boaters for Non-Motorized Boating

**Table 2.1**  
**Estimated Number of Non-Motorized Boats in California (2006)**

Category	Number of Boats	Percent of Total
1. Privately Owned	1,696,987	99.0%
2. Commercial and Institutional Owned	15,062	0.9%
3. Club Owned	2,700	0.1%
<b>Total</b>	<b>1,714,749</b>	<b>100.0%</b>

**Table 2.2**  
**Estimated Number of Non-Motorized Boats by Boat Type in California (2006)**

Boat Type	Privately Owned	Commercial/ Institutional Owned	Club Owned	Total Boats by Boat Type	Percent of Total
1. Inflatable*	707,983	3,526	–	711,509	41.5%
2. Kayak	534,381	8,870	–	543,251	31.7%
3. Canoe	190,063	942	500	191,505	11.2%
4. Rowing Boat	159,856	279	600	160,735	9.4%
5. Sailboard/Kiteboard	55,152	817	–	55,969	3.2%
6. Small Sailboat**	41,237	433	1,100	42,770	2.5%
7. Other	8,315	195	500	9,010	0.5%
<b>Total</b>	<b>1,696,987</b>	<b>15,062</b>	<b>2,700</b>	<b>1,714,749</b>	<b>100.0%</b>

\* For purposes of this study, the “inflatable” category includes inflatable rafts, catarafts, and transoms. Inflatable kayaks are included in the “kayak” category.

\*\* Many boaters consider any sailboat that they store at home, and load on their car, as a “small sailboat”, even if the sailboat is longer than 8 feet in length. This estimate of small sailboats includes a significant number of these longer small sailboats.

### Number of Boats by Boat Type

**Table 2.2**, above, illustrates the estimated number of non-motorized boats by boat type. These figures are based on the statewide random telephone survey results, by boat type for boat owners, as well as the commercial and institutional survey and information from boating clubs.

The largest category of non-motorized boats is inflatable boats and rafts, at 711,509. The inflatable boat category is very broad, and includes everything from small inflatable rafts (but not a toy raft), to a technically sophisticated whitewater raft, to a “Zodiac” tender used with, or without, a motor. Based on the survey responses, inflatable boats owned by respondents cover the full range of this spectrum.

Kayaks make up the second largest category of non-motorized boat, with an estimated 543,251 kayaks in California. **Table 2.3**, on the next page, illustrates the approximate number of kayaks, by the five major subcategories of kayaks. The single largest category of kayaks owned in California are recreational kayaks.

Canoes and rowing boats make up the next two largest categories of non-motorized boats in California. There are an estimated 191,505 canoes, and 160,735 rowing boats in California.

There are an estimated 55,969 sailboards and kiteboards in California. The vast majority of these are sailboards.

There are an estimated 42,770 small sailboats in California. This estimate may be high due to people responding that they had a “small” sailboat, even if it was over 8 feet in length. The distinction between

**Table 2.3**  
**Estimated Number of Kayaks by Kayak Type in California (2006)**

Category of Kayaks	Privately Owned Kayaks	Commercial/Institutional Owned Kayaks	Total Kayaks by Kayak Type	Percent of Total
1. Recreational Kayak	236,891	5,102	241,993	44.6%
2. Sea/Touring Kayak	132,206	1,864	134,070	24.7%
3. Inflatable Kayak*	74,386	1,175	75,561	13.9%
4. Whitewater Kayak	55,095	450	55,545	10.2%
5. Other Kayaks	35,803	279	36,082	6.6%
<b>Total</b>	<b>534,381</b>	<b>8,870</b>	<b>543,251</b>	<b>100.0%</b>

\* There is some ambiguity within kayak definitions, as inflatable kayaks may be used for recreational paddling, touring, and whitewater paddling.

**Table 2.4**  
**Estimated Number of Non-Motorized Boats by Boat Type and Utilization Level in California (2006)**

Boat Type	Privately Owned	Commercial/Institutional Owned	Club Owned	Total Boats by Boat Type	Percent of Total
a. Boats Utilized 5 Days or More per Year	1,176,351			1,194,113	69.6%
1. Kayak	471,084	8,870		479,954	28.0%
2. Inflatable*	415,931	3,526		419,457	24.5%
3. Canoe	123,880	942	500	125,322	7.3%
4. Rowing Boat	93,674	279	600	94,553	5.5%
5. Sailboard/Kiteboard	44,122	817		44,939	2.6%
6. Small Sailboat**	19,345	433	1,100	20,878	1.2%
7. Other	8,315	195	500	9,010	0.5%
b. Boats Utilized 1 to 4 Days per Year	300,197			300,197	17.5%
c. Boats Not Utilized Within Last 5 Years	220,439			220,439	12.9%
<b>Total</b>	<b>1,696,987</b>	<b>15,062</b>	<b>2,700</b>	<b>1,714,749</b>	<b>100.0%</b>

\* For purposes of this study, the "inflatable" category includes inflatable rafts, catarafts, and transoms. Inflatable kayaks are included in the "kayak" category.

\*\* Many boaters consider any sailboat that they store at home, and load on their car, as a "small sailboat", even if the sailboat is longer than 8 feet in length. This estimate of small sailboats includes a significant number of these longer small sailboats.

a small sailboat for survey purposes and what the sailing public views as a small sailboat (i.e. any sailboat up to about 11 or 12 feet in length) is not clear to the average person.

Table 2.2 and Table 2.3 provide estimates for the total number of non-motorized boats in California, by boat type. However, almost one-third of non-motorized boats in the State were not used regularly. In order to focus on non-motorized boats that Californian's utilized most frequently on State waterways, **Table 2.4**, above, provides estimates of

non-motorized boats, by boat type, for only those boats that were regularly used by California boat owners, or were in commercial, institutional, or club fleets. "Regular" non-motorized boat use for boat owners was defined, for purposes of this study, as boats owned by boat owners that utilized their non-motorized boat(s) five (5) or more days per year.

The study defined two additional categories of non-motorized boat owners: (1) "infrequent" boaters, defined as non-motorized boat owners that utilized their non-motorized boat(s) between

**Table 2.5**  
**Estimated Number of Kayaks Utilized Five Days or More per Year, by Kayak Type in California (2006)**

Category of Kayaks	Privately Owned Kayaks	Commercial/Institutional Owned Kayaks	Total Kayaks by Kayak Type	Percent of Total
1. Recreational Kayak	203,838	5,102	208,940	43.5%
2. Sea/Touring Kayak	121,210	1,864	123,074	25.7%
3. Inflatable Kayak*	68,872	1,175	70,047	14.6%
4. Whitewater Kayak	49,605	450	50,055	10.4%
5. Other Kayaks	27,559	279	27,838	5.8%
<b>Total</b>	<b>471,084</b>	<b>8,870</b>	<b>479,954</b>	<b>100.0%</b>

\* There is some ambiguity within kayak definitions, as inflatable kayaks may be used for recreational paddling, touring, and whitewater paddling.

one and four days per year, and (2) “inactive” non-motorized boat owners, defined as non-motorized boat owners that did not utilize their boat(s) in the last five years. For the latter two boat owner categories, Table 2.4 provides only the total number of non-motorized boats.

Because they are based on a smaller number of survey responses, the boat type estimates provided in Table 2.4 are less statistically accurate than the overall boat type estimates provided in Table 2.2. However, these estimates of regularly used boats provide reasonable estimates of the relative number of boats, by boat type, particularly for kayaks and inflatable boats.

The largest category of non-motorized boats among regularly used boats was kayaks, with an estimated 479,954 regularly used total kayaks in California. **Table 2.5**, above, illustrates the approximate number of kayaks, by the five major subcategories of kayaks. The single largest category of kayaks owned in California was recreational kayaks. Similar to Table 2.4, Table 2.5 only provides kayak type estimates for those kayaks that were regularly utilized on California waterways.

There were an estimated 300,197 infrequently used non-motorized boats, owned by Californian’s that only utilized their non-motorized boat(s) between one and four days per

year. There were an additional estimated 220,439 inactive non-motorized boats, which were not utilized by boat owners during the last five years.

**Table 2.6**, on the next page, provides a comparison of the number of boats, by boat type, between all boats and regularly used boats. The “Number of Boats Utilized Four Days or Less Per Year” category in Table 2.6 includes the 300,197 infrequently used boats that were utilized one to four days per year, and the 220,439 boats that were not utilized within the last five years, for a total of 520,636 boats.

Table 2.6 illustrates the significant variation in utilization levels between boat types. For example, there were an estimated 292,052 inflatable boats that were either infrequently used (1 to 4 days per year), or inactive (not used within the last five years). This represents over one-half (56.1 percent, or 292,052/520,636) of the total estimated 520,636 infrequently used and inactive boats. The last column in Table 2.6 illustrates that 41 percent of inflatable boats (292,052/419,457) were infrequently used or inactive inflatable boats. The same analysis for kayaks shows very different results. Kayaks represent only 12.2 percent (63,297/520,636) of infrequently used and inactive boats, and only 11.7 percent of kayaks (63,297/479,954) were infrequently used or inactive kayaks.

**Table 2.6**  
**Comparison of Estimated Number of Boats by Boat Type and Utilization Level in California (2006)**

Boat Type	Total Boats	Boats by Utilization Level	Number of Infrequently Used Boats and Inactive Boats, by Type	Percent of Total Infrequently Used Boats and Inactive Boats	Percent of Infrequently Used Boats and Inactive Boats, by Boat Type
		<b>Regularly Used Boats</b>			
1. Kayak	543,251	479,954	63,297	12.2%	11.7%
2. Inflatable	711,509	419,457	292,052	56.1%	41.0%
3. Canoe	191,505	125,322	66,183	12.7%	34.6%
4. Rowing Boat	160,735	94,553	66,182	12.7%	41.2%
5. Sailboard/Kiteboard	55,969	44,939	11,030	2.1%	19.7%
6. Small Sailboat	42,770	20,878	21,892	4.2%	51.2%
7. Other	9,010	9,010	–	0.0%	0.0%
		<b>Infrequently Used Boats</b>			
8. Boats Utilized 1 to 4 Days per Year (Infrequently Used)		300,197			
		<b>Inactive Boats</b>			
9. Boats Not Utilized Within Last 5 Years (Inactive)		220,439			
<b>Total</b>	<b>1,714,749</b>	<b>1,714,749</b>	<b>520,636</b>	<b>100.0%</b>	

## Number of Boats by Region

**Table 2.7**, on the next page, provides the estimated number of privately owned non-motorized boats by ten California regions. As Table 2.7 shows, the incidence rate, i.e. percent of households in a given region owning one or more non-motorized boats, varies significantly by region. In general, the less-populated, more rural, regions of the State have higher rates of non-motorized boat ownership, and the urban regions of the State have lower rates of non-motorized boat ownership. Even with a low incidence rate of 4.9 percent, the South Coast region, which is the most populated region of the State, has the greatest number of non-motorized boats. The Sacramento Basin region, with numerous lakes and rivers, has the next largest number of non-motorized boats, with almost 16 percent of households owning one, or more, non-motorized boats. The San Francisco Bay Area is the region with the third greatest number of non-motorized boats. At the

other end of the spectrum, the Eastern Sierra and Northern Interior regions have a relatively small number of non-motorized boats, even though these two regions have high incidence rates. The Southern Interior region has the lowest incidence rate. This low rate is not surprising, given that there are relatively few waterways in the region.

**Exhibit 2.1**, on page 2-7, illustrates the ten State regions, counties, populations, and number of households, by region.

## B. Number of Non-Motorized Boating Participants in California

There are many types of non-motorized boating participants in California:

- Participants that own non-motorized boats
- Participants that rent non-motorized boats

**Table 2.7**  
**Estimated Number of Privately Owned Non-Motorized Boats (NMB) by Region in California (2006)**

Region	Incidence Rate (Percent of Households Owning NMBs)	Number of Households Owning NMBs	Number of NMBs Owned by Households	Percent of Total
1. North Coast (NC)	19.25%	59,391	105,349	6.2%
2. San Francisco Bay Area (SF)	6.56%	173,760	297,465	17.5%
3. Central Coast (CC)	13.87%	49,434	98,903	5.8%
4. South Coast (SC)	4.87%	246,332	398,837	23.5%
5. San Diego (SD)	7.54%	88,429	154,119	9.1%
6. Northern Interior (NI)	23.79%	8,892	17,608	1.0%
7. Sacramento Basin (SB)	15.79%	191,639	365,619	21.6%
8. Central Valley (CV)	7.68%	105,230	175,805	10.4%
9. Eastern Sierra (ES)	20.11%	3,174	6,252	0.4%
10. Southern Interior (SI)	3.15%	43,426	77,030	4.5%
<b>Total</b>	<b>7.84%</b>	<b>969,707</b>	<b>1,696,987</b>	<b>100.0%</b>

- Participants that attend non-motorized boat classes
- Participants that attend guided trips in non-motorized boats
- Participants that boat with non-motorized boating clubs.

The majority of non-motorized boating participation takes place among those that own their own boats; however, the other components of non-motorized boating are still significant and important aspects of the activity.

**Table 2.8**, right, provides an overview of California non-motorized boating participation by category. This table reflects the total number of boat-owning and other participants, and adjusts for overlapping participation by boat owners. For example, a boat owner that participates in both canoeing and kayaking would only be counted once in this table. The 1.9 million figure for boat-owning participants reflects only the 82 percent of boat owners that participated in the last five years. The total 2.5 million participants results in a participation rate of 8.2 percent of Californians, ages twelve and older.

Behind boat-owner participation, guided trip participation is the second largest category. Most guided trip participation takes place either as whitewater rafting or sea kayaking.

Non-motorized boat participation through rentals is also high. Kayaks, canoes, and inflatable boats make up the three most common rental categories.

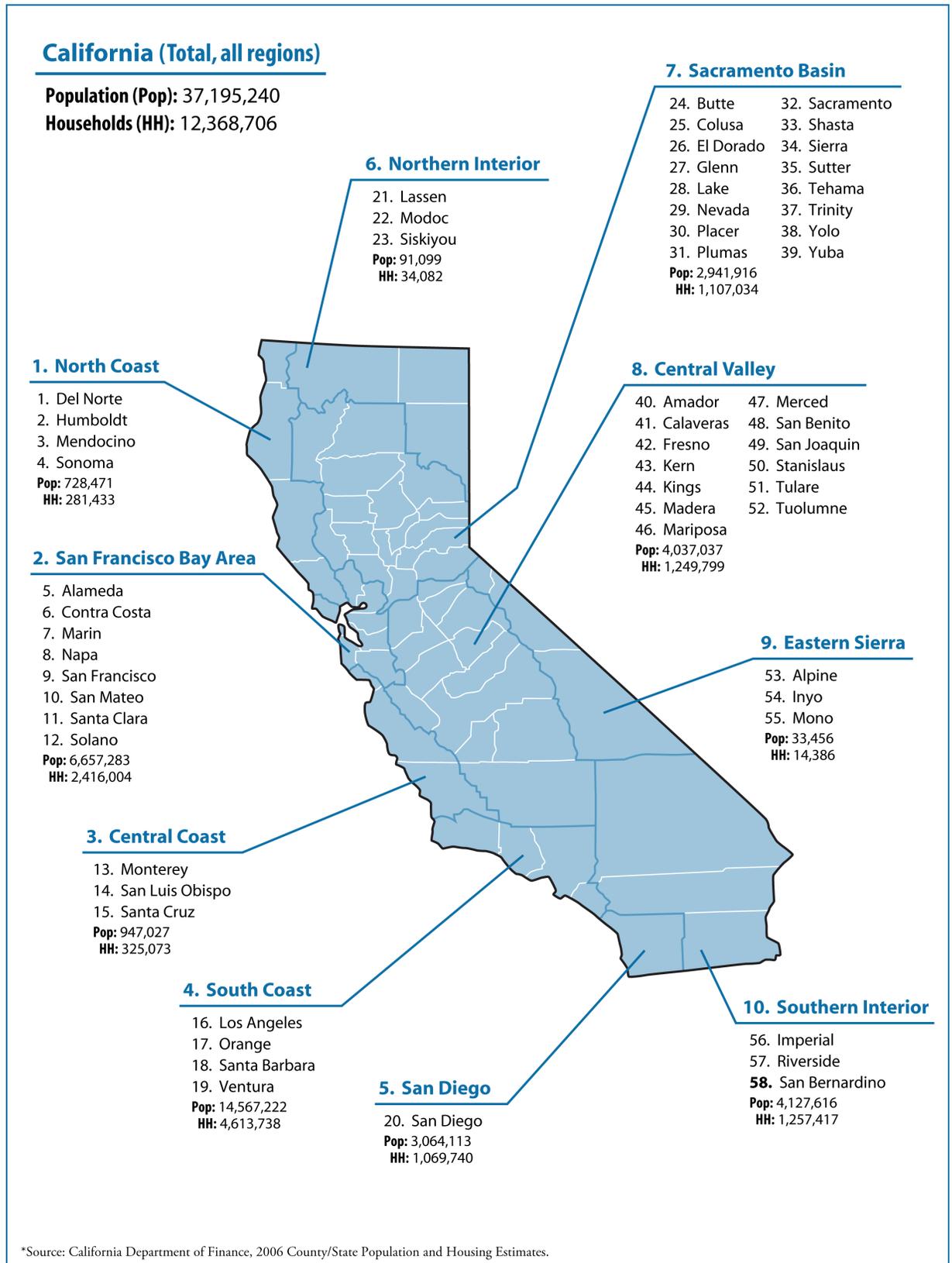
Participation in instruction is relatively low, based on our commercial and institutional survey. There may be a limited amount of double-counting in rental, instruction, and guided trip participation, as some individuals participate in more than one activity in a year. Commercial survey respondents

**Table 2.8**  
**Estimated Number of Non-Motorized Boating Participants in California (2006)**

Participant Type	Number of Participants	Percent of Total
1. Boat-Owning Participants	1,917,503	77.0%
2. Guided Trip Participants	243,827	9.8%
3. Rental Participants	208,902	8.4%
4. Instruction Participants	87,093	3.5%
5. Club Participants	33,000	1.3%
<b>Total</b>	<b>2,490,325</b>	<b>100.0%</b>

**Exhibit 2.1**

**DBW Regions by County, with Regional Population and Number of Households (2006)\***



## 2. Boats and Boaters for Non-Motorized Boating

indicated that the majority of customers participated with them only once, but this does not exclude participating with more than one vendor.

The estimate of 33,000 for club participation in non-motorized boating is conservative, in that it only includes rowing clubs, dragon boat clubs, outrigger canoe clubs, and yacht club small sailboat programs. These data do not include individuals that come to California for non-motorized boating events (races) or vacations. Events such as rowing regattas, dragon boat festivals and outrigger canoe races can bring hundreds of teams and thousands of additional boaters to California. In addition, a smaller number of individuals travel to California specifically for non-motorized boating activities, such as whitewater kayaking, sea kayaking, and windsurfing.

### Number of Participants by Boat Type

**Table 2.9**, below, provides estimated non-motorized boating participants by boat type, for regular non-motorized boaters, as well as commercial, institutional, and club participants.

These estimates are conservative because they do not take into account that a participant may utilize more than one boat type. For boat owners, the boat type participant estimates in Table 2.6 were based on the estimated total number of non-motorized boat participants (1,917,503), multiplied by the percent of regularly and infrequently utilized boats, by boat type. For example, kayaks represented 31.9 percent of regularly and infrequently utilized boats, and thus 31.9 percent of boat participants, or 611,683 kayak participants (1,917,503 x 31.9 percent).

As Table 2.9 illustrates, the number of boat-owning participants was highest for kayaks. However, the total estimated number of non-motorized boating participants was highest for inflatable boats, due to the high number of guided trip, rental, and instruction inflatable boat participants. Kayak and inflatable boat participants combined made up almost two-thirds of 2006 non-motorized boating participants in California.

**Exhibit 2.2**, starting on the next page, provides a summary matrix of boater participants by boat type. This exhibit summarizes characteristics and boating

**Table 2.9**  
**Estimated Non-Motorized Boating Participants by Boat Type in California (2006)**

Boat Type	Boat Owning Participants*	Guided Trip, Rental, and Instruction Participants	Club Participants	Total Participants	Percent of Total
a. Boats Utilized 5 Days or More per Year	1,528,250			2,101,072	84.4%
1. Kayak	611,683	164,525	–	776,208	31.2%
2. Inflatable	540,736	272,765	–	813,501	32.7%
3. Canoe	161,070	60,085	3,000	224,155	9.0%
4. Rowing Boat	120,803	6,164	5,000	131,967	5.3%
5. Sailboard/Kiteboard	57,525	14,356	–	71,881	2.9%
6. Small Sailboat	24,928	8,209	22,000	55,137	2.2%
7. Other	11,505	13,718	3,000	28,223	1.1%
b. Boats Utilized 1 to 4 Days per Year	389,253	–	–	389,253	15.6%
<b>Total</b>	<b>1,917,503</b>	<b>539,822</b>	<b>33,000</b>	<b>2,490,325</b>	<b>100.0%</b>

\* Total participants by boat type were adjusted to match the total number of participants overall. As a result, these estimates assume that each participant utilized only one boat type. Because some participants used multiple boat types, these are conservative estimates of boat type participation.

**Exhibit 2.2**

**Description of Non-Motorized Boating by Boat Type in California (2006)**

Boat Type	Typical Boat Owner Participants (Most-used boat)	Typical Commercial Participants	Typical Active-User Participants
1. Inflatable Boats	Only 38 percent of respondents participated in boating more than 20 years. More respondents participated less than five years (17 percent) and 5 to 9 years (14 percent) than other boat types. Relatively low 78 percent used their boats in the last five years. Participate less than many other boat types, an average of 18, and median of 7, days per year. More than half of respondents use inflatables on various lakes, but also used on mix of rivers and ocean harbors and bays. Respondents in all regions, especially SB, SC, SF, and CV.	Most inflatable rentals in the CV and SB regions, on rivers. Very little inflatable instruction, primarily for guide training. Large majority of commercial non-motorized activity in California is whitewater river rafting, with guides, on various California rivers, mostly in the SB and CV regions, with some additional trips in the NC and NI regions.	Only 8 percent of respondents used inflatable boats as their most-used boat, typically using an inflatable whitewater raft on the South Fork of the American River, or other whitewater rivers. Very few respondents used their inflatable boat on lakes or bays.
2A. Recreational Kayaks	Fewer respondents have boated more than 20 years than for other boat types (45 percent). Relatively large number boating less than 5 years (13 percent) and 5 to 9 years (21 percent). Average years owned for most-used recreational kayak is 4 years. Ninety-four percent of respondents used their kayaks in the last five years. Those respondents participate an average of 35, and median of 16, days per year. Respondents use kayaks on mix of lakes, rivers, and ocean bays and harbors. Respondents in all regions, especially SC, SF, and NC.	Most commercial kayak participation (all types) are rentals and instruction. Most rentals are recreational or sit-on-tops, while instruction is typically sea/touring or whitewater. Most guided trips are for sea/touring kayaks. Almost one-half of guided trips are in the SC region, with large numbers also in CC, SD, and SF.	Just under 10 percent of respondents use recreational kayaks, many on lakes and SC/SD harbors and bays.  (Note: another 13 percent of active-user survey respondents used some other type of kayak, such as racing, flatwater, surf, surfski, fishing, etc.).
2B. Sea/Touring Kayaks	More than one-half respondents have boated more than 20 years, but 13 percent have boated less than five years. All respondents had used their sea or touring kayaks in the last five years. Participate an average of 35, and median of 24, days per year, significantly higher than statewide average. Respondents used their kayaks on a wide variety of ocean areas, lakes, and rivers. More respondents in SB, SD, and SC regions.	See Recreational Kayaks	One-half of respondents use a kayak as the most-used boat. Of these kayakers, 38 percent use sea/touring kayaks, mostly on San Francisco Bay, as well as other ocean locations and lakes.
2C. Inflatable Kayaks	All respondents participated in boating 10 or more years, and all participated within the last five years. Participate an average of 24, and median of 16, days per year. Majority of respondents use their kayaks on lakes. Respondents spread across all regions except CC and SI.	See Recreational Kayaks	A low percentage of respondents used inflatable kayaks. Majority of respondents use their inflatable kayaks on rivers, especially the South Fork of the American, as well as Kern River. Less than one-half use kayaks on lakes.
2D. Whitewater Kayaks	Very few respondents used a whitewater kayak most often. Most have boated more than 20 years. All respondents used their kayaks within the last five years. Participate an average of 40, and median of 25, days per year. Respondents typically use rivers (American, Truckee, others). Respondents in mix of regions.	See Recreational Kayaks	Over one-third of respondents, 35 percent, use whitewater kayaks. The vast majority do so on the Forks of the American River, as well as other whitewater rivers.

## 2. Boats and Boaters for Non-Motorized Boating

### Exhibit 2.2

#### Description of Non-Motorized Boating by Boat Type in California (2006) (continued)

Page 2 of 2

Boat Type	Typical Boat Owner Participants (Most-used boat)	Typical Commercial Participants	Typical Active-User Participants
3. Canoes	More than one-half of respondents have boated more than 20 years. Just under 80 percent used their boat in the last five years. Those that did use their canoes participate an average of 25, and median of 10, days per year. Large majority of respondents canoe on lakes, with a few in harbors and rivers. Respondents spread across all regions, with more in SF, SB, and SC regions.	One-half of commercial canoe participation is rentals in the NC region (especially the Russian River). About 25 percent is due to rentals in the SC region, with significant numbers in SD also. Most instruction in SC, most guided trips in SF.	Ten percent of respondents use some type of canoe as most-used boat. Over one-half were outrigger canoeists, boating from harbors into open ocean. About one-third use standard canoes, in mix of lakes, rivers, and some bays. Just over 10 percent used whitewater canoes, mostly on Forks of the American River and other whitewater rivers.
4. Rowing Boats	Most respondents used rowing boats (not rowing shells). Very few new boater respondents, with 65 percent boating more than 20 years, and 19 percent between 15 and 20 years. Only 6 percent boating less than five years. A total of 87 percent of respondents used their boats in the last five years. Participate an average of 29, and median of 20, days per year. Most respondents were in the SB and NI regions, also SF and NC – very few rowing boats in Southern California. Boats used on mix of lakes and rivers (not whitewater rivers).	Very little commercial activity with rowing boats, primarily teaching rowing using shells or sculls in the SC, SF, SB, and SD regions.  Commercial survey did not capture guided fishing in drift boats, which often do not have motors. This would increase guided trips with rowing boats, but is likely small compared to inflatables and kayaks.	Twelve percent of respondents used rowing boats as their most used boat, almost all of these using rowing shells or sculls. Most respondents used rowing shells or sculls with clubs in Mission Bay, Marina Del Rey, San Francisco Bay (especially near Redwood City), Lexington Reservoir, Sacramento Deep Water Port, and others. Most respondents in SD, SC, SF, and SB regions.
5. Sailboards/ Kiteboards	Very few respondents with sailboards and kiteboards. Two-thirds of respondents participated in boating more than 15 years. Kiteboard respondents used boards in last five years. Those that did use their boards participate a relatively low average of 11, and median of 10, days per year. Half of respondents in SF region, also SC, SD, SB.	Most rental and instruction in the SF region, also significant amount of instruction in the SC region, and limited amounts in SD and SB. Little to no sailboard/kiteboard commercial activity in interior regions, except SB. Limited guided trips, all in SF region.	Majority of survey respondents in SF region, also responses in SC and SD regions. Most use specific locations in SF bay. Relatively few kiteboarders as compared to sailboarders, although many respondents owned both.
6. Small Sailboats	Few respondents specified small sailboat as their most-used boat. One-half have participated in boating more than 20 years, 25 percent for 15 to 20 years, and 17 percent for 5 to 9 years. Two-thirds participated in boating in the last five years. Participate an average of 39, and median of 35, days per year. Most respondents in SF region, use sailboats on SF bay, others use on lakes.	Most participation is for sailing instruction. Small sailboats are typically used for junior sailing programs, although many programs use sailboats that are greater than 8 feet in length.	Very few respondents specified small sailboat as most-used boat. Mix of newly purchased boats and old boats. Most used for racing, in coastal regions.
7. Other Boats	Very few respondents with “other” type of most-used boat, including pedal boat and dragon boat, all used within last five years. One-half respondents participated in boating more than 20 years, and one-half participated between 5 and 9 years. Participate a very high average of 61, and median of 65, days per year. Use on SF bay, rivers, and lakes.	Majority of rental participation in NC region, for pedal boats. Most instruction in SF, SD, and SC regions, for dragon boats, stand-up paddle surfing. Limited guided trips.	Most active-user survey other boat respondents used dragon boats as their most-used boat, accounting for 4 percent of all respondents. Most located in SC region, also some in SF and SD. Many use Long Beach/Naples area, also Mission Bay, and San Francisco Bay.

**Table 2.10**  
**Estimated Non-Motorized Boating Participants by Region in California (2006)**

Region	Boat Owning Participants	Guided Trip, Rental, and Instruction Participants	Club Participants	Total Participants	Percent of Total
1. North Coast	116,947	70,523	–	187,470	7.5%
2. San Francisco Bay Area	318,111	45,122	9,000	372,233	15.0%
3. Central Coast	120,223	26,404	1,400	148,027	5.9%
4. South Coast	516,644	108,317	12,800	637,761	25.6%
5. San Diego	166,157	52,979	9,600	228,736	9.2%
6. Northern Interior	18,375	13,953	–	32,328	1.3%
7. Sacramento Basin	339,881	122,627	200	462,708	18.6%
8. Central Valley	238,857	96,622	–	335,479	13.5%
9. Eastern Sierra	5,451	725	–	6,176	0.2%
10. Southern Interior	76,857	2,550	–	79,407	3.2%
<b>Total</b>	<b>1,917,503</b>	<b>539,822</b>	<b>33,000</b>	<b>2,490,325</b>	<b>100.0%</b>

**Table 2.11**  
**Estimated Non-Motorized Boating Participation Days in California (2006)**

Participant Type	Number of Days	Percent of Total
1. Boat-Owning Participants	45,905,022	94.6%
2. Club Participants	1,870,000	3.9%
3. Guided Trip, Rental, and Instruction Participants	726,472	1.5%
<b>Total</b>	<b>48,501,494</b>	<b>100.0%</b>

patterns for boat owners, commercial/institutional participants, and active-user participants. The latter category is based on results of the active-user Internet survey of 1,518 non-motorized boaters.

### Number of Participants by Region

**Table 2.10**, above, provides estimated non-motorized boating participants for each of the ten regions. The South Coast, Sacramento Basin, San Francisco Bay Area, and Central Valley regions had the largest number of non-motorized boating participants.

**Exhibit 2.3**, starting on the next page, provides a summary matrix of boater participant characteristics by region. The exhibit summarizes boat owning participants, commercial/institutional participants, and active-user participants. Note that non-motorized boaters may frequent waterways out of the region they reside in.

### C. Number of Non-Motorized Boating Participation Days in California

Number of participation days reflects the total number of non-motorized boaters, multiplied by the average number of days of participation, and the percent of boat owners that participated in non-motorized boating over the last five years. The total number of participation days, by activity, is provided in **Table 2.11**, left. The 48.5 million participation day figure is based on the statewide average number of days per year for boat owners of 24.0. This 48.5 million participation day figure also was adjusted to reflect the fact that 18 percent of respondents did not use their boat in the last five years.

## 2. Boats and Boaters for Non-Motorized Boating

### Exhibit 2.3

#### Description of Non-Motorized Boating by Region in California (2006)

Page 1 of 2

Region	Typical Owned Boat Type (Most-used boat)	Typical Boat Owning Participants	Typical Guided Trip, Rental, and Instruction Participants	Typical Active-User Participants
1. North Coast	Mix of most-used boat types, including canoes, inflatable rafts, recreational kayaks, rowing boats, sea/touring kayaks.	More than one-half of respondents have boated more than 20 years. Participate an average of 23, and median of 11, days per year. Mix of most-used waterways, including Russian River, Lake Mendocino, Lake Sonoma, Eel River, various harbors, and others.	Generally high numbers of rentals and guided trips. Relatively large number of canoe rentals, mix of local and out-of-town; mostly novice boaters; mix of rivers and sea kayaking for guided trips.	Mostly sea kayakers, most using Russian and Petaluma Rivers, as well as ocean and harbors.
2. San Francisco Bay Area	About one-third of most-used boats are inflatable rafts, also relatively high numbers of canoes and recreational kayaks. A few small sailboats and sailboards.	More respondents boating between 10 to 20 years than statewide averages. Participate an average of 21, and median of 7, days per year. Less than half of respondents use waterways in the SF region as most-used waterways. Many use SB lakes (Tahoe, Shasta), and NC rivers and lakes.	Generally high number of instruction participants. Most rental and instruction are local participants, beginners; more out-of-town participants for guided trips; primarily canoe and sea kayak for all three activities in SF Bay and local lakes.	Large number of sea kayakers and windsurfers/ kiteboarders. Several active and organized non-motorized boating clubs in the region. Also significant number of whitewater boaters that travel to the Forks of the American River.
3. Central Coast	Mix of most-used boat types, including about equal numbers of canoes, inflatable rafts, recreational kayaks, and rowing boats. Also a few small sailboats and inflatable transom boats.	More than 60 percent of respondents boating more than 20 years, relatively few new participants. Participate an average of 20, and median of 8 days per year. Most used waterway for about one-third of respondents was Monterey Bay area, another one-third at regional lakes, remaining one-third out-of-region.	Modest number of all three categories. Mix of locals and out-of-area participants, more out-of-towners for guided trips. Primarily sea kayaking in Monterey Bay area; primarily beginners.	Mix of many boat types. Several respondents using outrigger canoes, fishing kayaks, and sea/touring kayaks on local ocean and bays. Also many whitewater boaters traveling to SB and CV rivers.
4. South Coast	Over one-third of respondents use inflatable rafts as most-used boat. Also relatively high number of recreational kayaks, followed by canoes and sea/touring kayaks.	Years involved in boating similar to statewide averages. Participate an average of 23, and median of 10, days per year. About one-half of respondents use SC ocean locations as most used waterways. A few use SC lakes and the Colorado River; remaining go out of the region to participate.	Generally more out-of-town participants, especially for guided trips. Relatively high participation on all categories, especially instruction. Most activities take place in ocean locations.	Large number of respondents utilizing rowing shells, outrigger canoes, dragon boats, and sea/touring kayaks. Most using oceans, harbors, especially Marina del Rey and Long Beach area. Several whitewater boaters traveling to Kern River (CV).
5. San Diego	Relatively even mix of most-used boat types between inflatable rafts, inflatable kayaks, recreational kayaks, and sea/touring kayaks.	Almost 20 percent of respondents boating less than five years. Participate an average of 27, and median of 10, days per year. Most-used waterways include San Diego Harbor, Colorado River, and Mission Bay. Also a few local lakes and some out-of-region waterways.	Large number of instruction participants, relatively few guided trips. Many participants from out-of-state, but also locals, college students; mostly novice. Most activities in ocean, Mission Bay.	Large number of respondents using rowing shells/sculls and sailboards; fishing kayaks and sea/touring kayaks also popular. Most use boats on Mission Bay, San Diego Bay, and Lake Hodges.

Exhibit 2.3

Description of Non-Motorized Boating by Region in California (2006) (continued)

Region	Typical Owned Boat Type (Most-used boat)	Typical Boat Owning Participants	Typical Guided Trip, Rental, and Instruction Participants	Typical Active-User Participants
6. Northern Interior	About one-quarter each canoes, rowing boats, and inflatable rafts as most-used boats. Remaining respondents used a mix of kayak types (recreational, sea/touring, and inflatable).	More than one-half of respondents boating more than 20 years. Relatively more respondents in the 5 to 9 year category, and fewer participating less than 5 years than statewide. Participate an average of 21, and median of 10, days per year. Most-used waterways include Lake Siskiyou, Klamath River, Eagle Lake, and Kangaroo Lake. Also mix of other regional lakes and rivers.	Relatively large number of guided trips for whitewater river rafting. Most participants are families from out-of-town, but also some local participation.	Very few survey respondents, although many whitewater boaters in other regions utilized NI rivers (Klamath, Salmon, Pit).
7. Sacramento Basin	More than one-half of respondents use inflatable rafts as most-used boat. Other respondents use a mix of all other boat types. Relatively large number of respondents with inflatable rafts did not use in last five years.	Years involved in non-motorized boating similar to state average, except slightly more in the 15 to 20 year range. Participate an average of 25, and median of 12, days per year. Most used waterways include Sacramento and American Rivers, Lake Natoma, Folsom Lake, and other regional lakes and rivers.	Significant numbers of guided trip participation, primarily whitewater rafting on the South Fork of the American River. Mix of local and out-of-town participants, many groups, all ages and ability levels.	Large number of whitewater kayakers and rafters boating on the Forks of the American River. Also many sea/touring kayakers that use Lake Natoma and local/mountain lakes. Several rowing club members also completed surveys.
8. Central Valley	Just over one-half of respondents use inflatable rafts as their most-used boat. Other respondents use a mix of boats, primarily recreational, sea/touring, and inflatable kayaks.	Greater percentage of new boaters in this region, based on respondents. Over 20 percent boating less than five years, and almost 20 percent boating 5 to 9 years. Still about one-half boating over 20 years. Participate an average of 30, and median of 10, days per year. Respondents use a wide range of regional lakes and rivers as most-used waterways, including Kern River, Bass Lake, and many others.	Significant numbers of guided trip participation on region whitewater rivers (Kern, Kings, Tuolumne, etc.). Relatively more out-of-town, families, and groups. Mix of ability levels, depending on rivers.	Large number of whitewater kayakers and rafters boating on the Kern and King Rivers. Also a mix of sea/touring kayakers, canoes, recreational kayaks on local lakes, some traveling to the ocean.
9. Eastern Sierra	Mix of most-used boat types, including: inflatable rafts, recreational kayaks, canoes, inflatable kayaks, and rowing boats.	More respondents with 10 to 20 years of boating participation, fewer new boaters with less than 10 years participation. Participate an average of 23, and median of 11, days per year. Respondents use a mix of mostly regional lakes and rivers, including: Owens River, Mammoth Lake, Klondike Lake, Crowley Lake, Diaz Lake, and others.	Mix of locals and out-of-town; kayaking on local lakes. Likely also small canoe and kayak rentals on area lakes that were not captured in survey.	Very few survey respondents from this region. Some respondents from other regions traveling to ES lakes for recreational kayaking, canoeing.
10. Southern Interior	One-half of respondents use inflatable raft as most-used boat. Other respondents use mix of other inflatable boats, canoes, others.	Fewer respondents with more than 20 years participation and more in the 5 to 14 year range than statewide. Approximately 40 percent did not boat in last five years. Those that did participate an average of 9, and median of 4, days per year. Few respondents use regional waterways, including Colorado River, Silverwood Lake, Lake Elsinore, Big Bear Lake. Many respondents use mountain lakes in other regions.	No guided trips in this region, relatively little rental and instruction. Mix of local and out-of-town participants.	Mostly sea/touring kayakers using Lake Perris, ocean, and area lakes. Also several whitewater boaters that travel to the Kern River (CV).

**Table 2.12**  
**Estimated Non-Motorized Boating Participation Days by Boat Type in California (2006)**

Boat Type	Boat Owner Annual Participation Days	Club Participation Days	Guided Trip, Rental, and Instruction Participation Days	Total Participation Days	Percent of Total
a. Boats Utilized 5 Days or More per Year	45,023,110			47,619,582	98.2%
1. Kayak	21,284,610	–	231,745	21,516,355	44.4%
2. Inflatable	13,420,545	–	337,083	13,757,628	28.3%
3. Canoe	4,691,745	300,000	101,706	5,093,451	10.5%
4. Rowing Boat	3,365,844	500,000	7,265	3,873,109	8.0%
5. Sailboard/Kiteboard	567,450	–	18,888	586,338	1.2%
6. Small Sailboat*	1,194,846	770,000	10,171	1,975,017	4.1%
7. Other	498,070	300,000	19,614	817,684	1.7%
b. Boats Utilized 1 to 4 Days per Year	881,912	–	–	881,912	1.8%
Total	45,905,022	1,870,000	726,472	48,501,494	100.0%

The majority (94.6 percent) of non-motorized boating participation days is due to boat-owning participants activity. One-time guided trip, rental, and instruction participation makes up only 1.5 percent of participation days. Rowing, outrigger, sailing, and dragon boat club participants make up a somewhat larger number of participation days (3.9 percent).

**Table 2.12**, above, provides total estimated non-motorized participation days by boat type, and use levels. Boat-specific use estimates were only provided for regularly used non-motorized boats. These data reflect boat-specific average participation days per regular boat owner participant, multiplied by the number of boat-specific participants, and adjusted to the statewide 2006 total boat-owner participation days estimate of 45,905,022.

There were an estimated 21.5 million kayak participation days in California in 2006, reflecting over 44 percent of all non-motorized boating

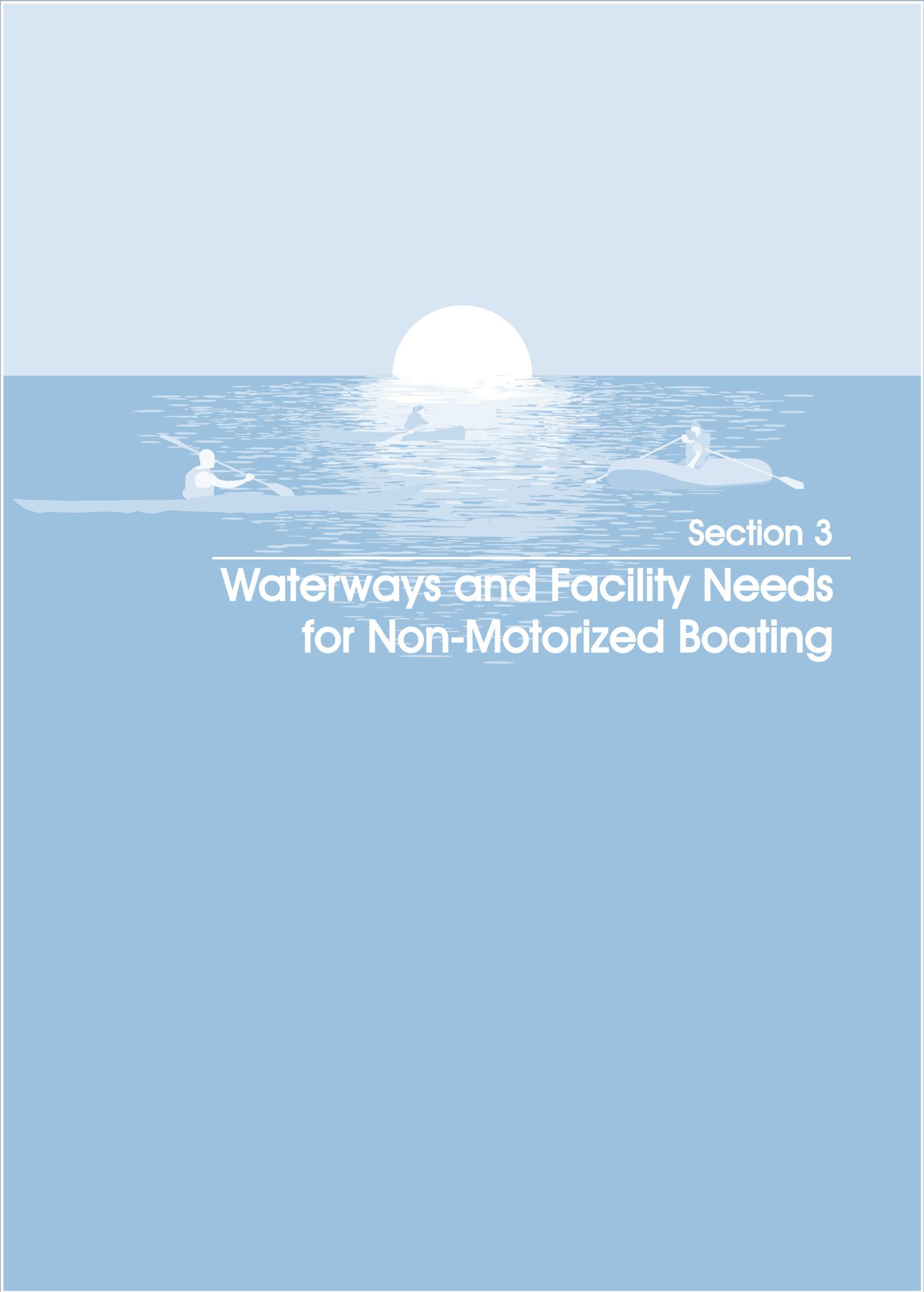
participation days. Inflatable boat participation days were the next highest, accounting for 28 percent of all non-motorized boating participation days. Infrequent boat owner participants accounted for less than 2 percent of total non-motorized boating participation days in 2006.

**Table 2.13**, on the next page, provides total estimated non-motorized boating participation days by region. These data reflect region-specific average participation days, and region-specific percentages for participation in the last five years.

The most populated region in the State, the South Coast, has the greatest number of participation days. This number reflects the high regional population, not a high percentage of non-motorized boat participants. The Sacramento Basin region, with only about 20 percent as many people as the South Coast region, has almost as many non-motorized boating participation days. The Sacramento Basin figure reflects the high percentage of non-motorized boat owners in the region.

**Table 2.13**  
**Estimated Non-Motorized Boating Participation Days By Region in California (2006)**

Region	Boat Owner Annual Participation Days	Club Participation Days	Commercial/ Institutional Participation Days	Total Participation Days	Percent Total
1. North Coast	2,767,040	–	86,377	2,853,417	5.9%
2. San Francisco Bay Area	6,792,986	542,500	54,838	7,390,324	15.2%
3. Central Coast	2,459,585	68,500	33,485	2,561,570	5.3%
4. South Coast	12,165,456	708,000	126,817	13,000,273	26.8%
5. San Diego	4,552,385	531,000	57,476	5,140,861	10.6%
6. Northern Interior	398,278	–	23,415	421,693	0.9%
7. Sacramento Basin	8,584,126	20,000	193,312	8,797,438	18.1%
8. Central Valley	7,313,888	–	147,324	7,461,212	15.4%
9. Eastern Sierra	131,413	–	878	132,291	0.3%
10. Southern Interior	739,865	–	2,550	742,415	1.5%
<b>Total</b>	<b>45,905,022</b>	<b>1,870,000</b>	<b>726,472</b>	<b>48,501,494</b>	<b>100.0%</b>



Section 3

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# Waterways and Facility Needs for Non-Motorized Boating

# 3. Waterways and Facility Needs for Non-Motorized Boating

This section of the report summarizes findings on waterways and facility needs for non-motorized boating in general, and for the ten (10) State regions. The discussion summarizes findings from several sources, including: the statewide and regional random telephone surveys; the active-user Internet survey; the commercial/institutional survey; the interest group meetings; interviews with waterway managers;<sup>1</sup> follow-up telephone calls with commercial and active-user survey respondents;<sup>2</sup> interviews with non-motorized boating organization representatives and experts;<sup>3</sup> and comments on the draft report.<sup>4</sup>

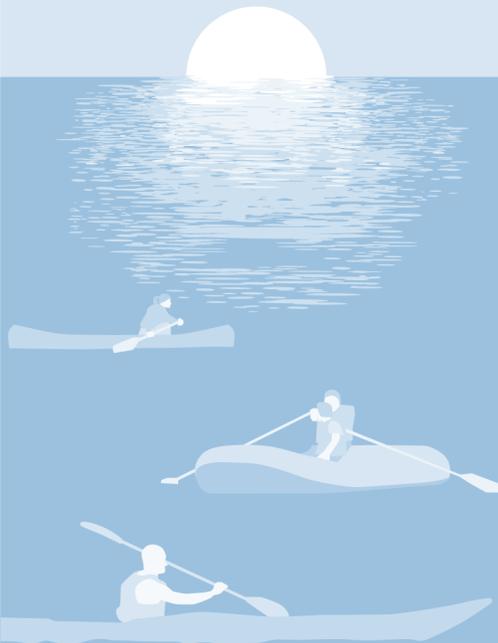
This section is organized as follows:

- A. *Overview of Waterways and Facility Needs for Non-Motorized Boating*
- B. *North Coast Region*
- C. *San Francisco Bay Area Region*
- D. *Central Coast Region*
- E. *South Coast Region*
- F. *San Diego Region*
- G. *Northern Interior Region*
- H. *Sacramento Basin Region*
- I. *Central Valley Region*
- J. *Eastern Sierra Region*
- K. *Southern Interior Region.*

## A. Overview of Waterways and Facility Needs for Non-Motorized Boating

Non-motorized boaters use many different types of waterways specific to the type of boating activity they are participating in. Whitewater rafters and kayakers frequent any of California's dozen-plus whitewater rivers. Sea kayakers frequent harbors, estuaries, the Pacific Ocean, and many lakes. Recreational kayakers and inflatable boaters typically use calmer waters such as certain rivers, small lakes, and harbors. Canoeists also typically favor calm lakes and rivers (unless they are whitewater or outrigger canoeists). Windsurfers and kiteboarders utilize specific locations on waterways that meet their wind and launch requirements.

In general, facility needs for non-motorized boating are significantly less than for motorized boating. Non-motorized boaters generally prefer "low-impact" facilities. Typically, non-motorized boating participants bring their boats to the water on top of, or in, their automobiles. The most important requirement is access points to the water. For any given access point, the key facility needs for non-motorized boating include: (1) a place



to unload vessels fairly close to the water; (2) a safe place to park; (3) restrooms; (4) a trail or access to the water; and (5) a beach, grassy area, or low freeboard dock close to water level from which to launch.

A facility need for non-motorized boats that is not shared by most motorized boats is a launching area that is close to the water level, such as a low freeboard dock. A standard motorized boat dock, which is 14 to 20 inches above the water level, does not provide convenient entry for non-motorized boats. Beyond the five basic needs identified above, there are many additional features that can improve the non-motorized boating experience. Such features include: signage, a freshwater boat wash, boating trails, overnight parking, camping, motor-boat free zones, and adequate water flow and/or water levels. **Table 3.1**, on the next page, summarizes the general facility needs and issues for eleven types of non-motorized boats.

The statewide and regional random telephone surveys and the active-user Internet survey asked respondents to identify why they chose to boat at the two waterways respondents use the most. **Table 3.2**, on page 3-4, summarizes the top five reasons why boaters chose a waterway for both the statewide random survey and the active-user Internet survey. For both groups of non-motorized boaters, “close to home” or “convenient” was the most frequent reason to boat at a favorite waterway.

The statewide and regional random telephone surveys and the active-user Internet survey also asked respondents about facility needs or issues at the two waterways they used most. **Table 3.3**, on page 3-4, summarizes the top five facility needs for the same surveys in Table 3.2. For both groups of non-motorized boaters, improved water access was the most frequently identified facility need.

The remainder of this subsection summarizes six (6) general issues related to non-motorized boating facilities and facility management.

## 1. DBW’s Boating Trails Programs

DBW’s Boating Trails Program is authorized to “pursue activities which will increase opportunities for recreational boating on designated waterways through the study and identification of recreational resources and potential boating trails routes.”<sup>5</sup> Since 1994, the program has funded over sixty-five (65) access projects, primarily on rivers, ranging in amount from \$30,000, to over \$250,000. The boating trails program works with river managers to publish boating trail guides, and has twelve such guides available on DBW’s website. In addition, the Boating Trails Program is involved in a review of proposed hydropower and other projects that might impact recreational boating, as well as hydropower relicensing meetings. The Program has been actively involved in the San Francisco Bay Area Water Trail Plan.

DBW has also constructed four (4) aquatic centers located on waterways throughout the State (Crown Cove Aquatic Center, Coronado; Northridge Aquatic Center, Castaic Lake; Humboldt State University Aquatic Center, Humboldt Bay; and California State University Sacramento Aquatic Center, Lake Natoma). These aquatic centers, operated by universities, provide classroom and on-the-water boating safety education for all ages. Most aquatic centers provide training for both motorized and non-motorized boating, including canoeing, kayaking, sailing, and windsurfing. DBW also annually supports dozens of public and private non-profit organizations offering boating instruction and safety classes to the public by providing grants to purchase instructional equipment and class scholarships to underserved populations.

## 2. Water Trails

The concept of water trails is not new; however, development and promotion of water trails has recently gathered nationwide momentum. A water trail is essentially a network of non-motorized boating access locations along a waterway. Each access point is generally within at least a half-day’s paddle from one another.

**Table 3.1**  
**Overview of Key Facility Needs by Non-Motorized Boat Types in California (2006)**

Boat Type	General Facility Needs and Issues
1. Canoes	<ul style="list-style-type: none"> <li>■ Gradual slope or long steps to the water (i.e. not steep)</li> <li>■ Flat place to launch from, close to water level (such as low freeboard dock)</li> <li>■ Parking and restrooms</li> </ul>
2. Outrigger canoes	<ul style="list-style-type: none"> <li>■ Storage for boats near water</li> <li>■ Access for getting on and off a beach</li> <li>■ Communication between boats and shore for emergencies</li> </ul>
3. Sea kayaks	<ul style="list-style-type: none"> <li>■ Gradual slope or long steps to the water (i.e. not steep)</li> <li>■ Flat place to launch from, close to water level (such as low freeboard dock)</li> <li>■ Parking and restrooms</li> <li>■ Security at parking areas</li> <li>■ Overnight parking for longer trips</li> </ul>
4. Whitewater kayaks and rafts	<ul style="list-style-type: none"> <li>■ Adequate water releases and flows</li> <li>■ Security at parking areas</li> <li>■ Access to water</li> <li>■ Parking and restrooms</li> </ul>
5. Recreational kayaks	<ul style="list-style-type: none"> <li>■ Gradual slope or long steps to the water (i.e. not steep)</li> <li>■ Flat place to launch from, close to water level (such as low freeboard dock)</li> <li>■ Parking and restrooms</li> </ul>
6. Inflatable boats (non-whitewater)	<ul style="list-style-type: none"> <li>■ Gradual slope or long steps to the water (i.e. not steep)</li> <li>■ Flat place to launch from, close to water level (such as low freeboard dock)</li> <li>■ Parking and restrooms</li> </ul>
7. Small sailboats	<ul style="list-style-type: none"> <li>■ No significant needs, as many small sailboats use yacht clubs to launch from</li> <li>■ Key need is a place to launch where they can carry, or wheel, boat on a dolly down to the water</li> </ul>
8. Rowing shells or sculls	<ul style="list-style-type: none"> <li>■ Storage for boats near water</li> <li>■ Lighted buoys for early morning rowing</li> <li>■ Shower facilities</li> <li>■ Parking and restrooms</li> </ul>
9. Sailboards	<ul style="list-style-type: none"> <li>■ Grassy or paved area for rigging</li> <li>■ Safe access to water in areas with adequate wind</li> <li>■ Parking and restrooms</li> </ul>
10. Kiteboards	<ul style="list-style-type: none"> <li>■ Adequate space for launching</li> <li>■ Areas with safe beach access</li> <li>■ Signage for kiteboarders and those on-shore regarding safety</li> <li>■ Parking and restrooms</li> </ul>
11. Dragon boats	<ul style="list-style-type: none"> <li>■ Storage for boats near water</li> <li>■ Lighted buoys for early morning rowing</li> <li>■ Shower facilities</li> <li>■ Parking and restrooms</li> </ul>

### 3. Waterways and Facility Needs for Non-Motorized Boating

**Table 3.2**  
**Top Five Reasons to Boat at a Favorite Waterway in California (2006)**

Statewide Random Survey	Active-User Internet Survey
1. Close to home or convenient	1. Close to home or convenient
2. Access to another activity (fishing, hunting, scuba/snorkeling, bird watching, etc.)	2. Water and/or flow conditions
3. Not crowded	3. Facilities (parking, restrooms, launch areas, etc.)
4. Facilities (parking, restrooms, launch areas, etc.)	4. Not crowded
5. Features or destinations (beach, shoreline amenities, etc.)	5. Features or destinations (beach, shoreline amenities, etc.)

**Table 3.3**  
**Top Five Facility Needs at a Favorite Waterway in California (2006)**

Statewide Random Survey	Active-User Internet Survey
1. Improved access to the water	1. Improved access to the water
2. Restrooms	2. Parking
3. Parking	3. Improved water conditions (water quality, hazards)
4. Maintain water levels or releases	4. Reckless boaters
5. Floats or launch ramps	5. Overcrowding

Typically a management agency or organization will develop maps, signage and education materials for a water trail. Water trails can help water managers guide non-motorized boaters to particular locations, and can provide a more organized management structure for a waterway.

The American Canoe Association promotes the development of water trails throughout the country, and has developed a database of designated water trails, including two in California: Humboldt Bay Water Trail, and Lake Tahoe Water Trail.<sup>6</sup> There are a number of less formal water trails in California, for example, those described in the boating trail guides published by DBW.

The San Francisco Bay Area Water Trail Act, signed into law by the Governor in 2005, established a formal planning structure for a San Francisco Bay Area Water Trail.

Formal legislation is not required in order to develop a water trail. However, in some cases, such as the San Francisco Bay Area, the formal

structure created by legislation may be necessary to move the water trail concept forward. Legislation was beneficial in the San Francisco Bay Area because there are many diverse groups and landowners with a stake in access points. Many survey respondents and special interest group meeting participants expressed interest in new boating water trails for California’s waterways.

### 3. Non-Motorized Boat Launches

There are a number of different types of launches that are appropriate for non-motorized boating. These types of launches include: beach access, stairways, floating launches, and concrete ramps. In 2004, the National Park Service (NPS), in coordination with American Whitewater and over one dozen state and local agencies, developed a design guidance manual for canoe and kayak launches.<sup>7</sup> This NPS document provides a reference guide for various types of launches, case studies, and plans for canoe and kayak launch ramps for different types of waterways and situations. The manual includes design considerations

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for launches in environmentally sensitive areas and launches that meet American with Disabilities Act accessibility guidelines.

#### 4. Waterway Management Approaches

A key issue related to waterways and facilities is management of California's diverse waterways to meet the needs of different types of recreational activities, while protecting the water and land environment. As non-motorized boating has grown over the last decade, conflicts, and potential conflicts, particularly between motorized boaters, non-motorized boaters, and fishermen, have grown. In addition, at many locations, there are concerns about the impacts of motorized and non-motorized boating activities on wildlife and sensitive natural habitats.

There are many management approaches that can be implemented on waterways. These management tools can enhance recreational experiences by reducing the potential for conflict between different types of waterway users. Management tools that have been implemented at some waterways across the country include: location zoning for certain waterway activities; time or day zoning for certain waterway activities; speed limits; noise regulations; watercraft horsepower limitations; boat permits and permit systems; rotational watercraft traffic patterns; speed lanes; commercial traffic lanes; and distribution of launch ramps and access points.<sup>8</sup>

One reason for the regulatory inconsistency is that California's waterways are managed by a number of different Federal, State, local, and regional public and private entities, including: Bureau of Land Management; National Park Service; National Forest; California State Parks; various counties and cities; water districts; and electric utility companies. Each management entity may have their own unique regulatory practices for a given waterway, and can regulate what types of boaters and activities are allowed on "their" waterway. Also, many

waterways are managed by more than one entity. Joint waterway management requires clear communication between agencies on management practices, education, and enforcement.

Launch ramps present a common waterway management problem. Several waterway managers commented on the challenges at launch ramps that are used by both motorized and non-motorized boaters. For launch ramps that are used by both motorized and non-motorized boaters, several waterway managers recommended providing signage to describe procedurally how non-motorized boats and power boats can safely and amicably launch from the same location.

#### 5. Whitewater Parks

Whitewater parks are the most costly, and technically sophisticated, type of facility for non-motorized boating. They typically involve creating an artificial river, or enhancing an existing river, to create a whitewater boating course that includes specific hydraulic features. Whitewater parks are used for recreational boating; instruction; boating festivals and events; and competitive whitewater boating. The closest whitewater park to California is the Truckee River Whitewater Park at Wingfield, in Reno, Nevada.<sup>9</sup>

This city-owned, \$1.5 million Reno facility was completed in 2004, and funded by Nevada state bonds, with start-up loans from the City of Reno and area casinos.<sup>10</sup> The project involved redevelopment of a stretch of the Truckee River that runs through the middle of the City of Reno into a 2,600 foot Class II and III whitewater course with boulders, pools, and drops.<sup>11</sup> The Reno whitewater park was part of an effort to attract tourists to the area for more than just gambling. One of the selling points of the project was the promise of a three-year payback due to economic contributions from visitors and event spectators, with the total economic impact of the

facility estimated at between \$1.9 million and \$4.1 million annually.<sup>12</sup>

There is considerable interest among California whitewater boaters to develop a whitewater park in the State. Such a development would require a significant amount of funding, and likely would need to be part of a broader redevelopment or recreational planning effort. As no one public entity is likely to be in the position to fund such a project alone, it would also require a coordinated effort, including private donors, and different levels of government entities.

## 6. Hydropower Relicensing

The hydropower relicensing process provides an opportunity for improving non-motorized boating alternatives for both flatwater and whitewater paddling. State and utility-owned dams typically have 30 to 50-year federal operating licenses from the Federal Energy Regulatory Commission.<sup>13</sup> Between 2005 and 2020, 150 dams, controlled by 25 separate hydropower projects, will be due for relicensing.<sup>14</sup>

During the five-year relicensing process, the utility must examine and consider environmental and recreational water requirements of the project, as well as water requirements for agriculture and energy generation. Utilities conduct extensive studies of the recreational impacts of their projects.<sup>15</sup> In final relicensing agreements, utilities may be required to remove dams, provide mandatory flow and reservoir levels, and/or develop facilities that support both motorized and non-motorized boating.

\* \* \* \* \*

The remainder of this section summarizes waterways and facility needs for non-motorized boating in each of the State's ten (10) regions. Most regional subsections include an exhibit and two tables. The maps in Exhibits 3.1 through 3.10

identify many of the key waterways in each region that are discussed in this section. However, these maps are not inclusive of *all* of the major and minor lakes, rivers, streams, harbors, and bays in California.

The first table in each subsection identifies frequently used waterways and facility needs for those waterways. These region-specific tables combine responses from the statewide and regional random surveys, the active-user Internet survey,<sup>a</sup> and the commercial/institutional survey. In addition, the tables incorporate comments from interest group meeting participants, as well as interviews with river managers; boating organization representatives; and telephone conversations with interested respondents from the commercial/institutional and active-user surveys.

In each table, the waterways were identified in priority order, with those waterways used most often and with the most facility needs, listed first in each table. When there were adequate data for a particular waterway, facility needs were ranked in numerical order. When there were not enough responses to provide a ranking, facility needs identified by the various respondents were indicated.

Specific locations for facility needs were identified whenever possible, but in most cases, responses were general in nature; for example, "improve access on the Russian River." These tables may be used for initial ranking and prioritization of potential future facility projects. However, the specific locations and designs of any particular project should best be developed collaboratively by local government agencies, local boaters, and DBW.

The second table in each subsection identifies waterways that survey respondents (statewide and regional random and active-user Internet)

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<sup>a</sup> Due to survey time constraints, we were limited to asking respondents about only their two most used waterways in the statewide and regional, and active-user, random surveys. Thus, usage data for specific waterways were conservative. As a result, we provided relative ranking of waterways in Section 3, combining data from random and active-user surveys, commercial surveys, and interest group meetings.

avoided using because of facility needs or other problems. Many of these waterways were the same waterways that other boaters identified as their most-used waterway. This result illustrates boaters' various levels of tolerance for a particular problem. For example, many boaters identified the Russian River as their most used waterway, but cited lack of access as a key facility need. Other boaters simply avoided using the Russian River because of lack of access.

For each region, these two tables, combined, can help identify those waterways with the greatest facility needs and problems. Similar to the first table in each subsection, the avoided waterways are listed in order, with those mentioned by the greatest number of respondents listed first. When there were adequate data, the problems were ranked numerically; otherwise problems were just indicated.

## B. North Coast Region

The North Coast region is predominantly rural, with a population of just over 700,000. The region was historically devoted to forestry, fisheries, and agriculture. There are no large cities in the region, although Sonoma County contains the expanding northernmost suburbs of San Francisco. Medium-sized cities in the region include Santa Rosa, Petaluma, and Eureka.

**Exhibit 3.1**, on the next page, illustrates major waterways in the North Coast region.

**Table 3.4**, below, identifies frequently used waterways and facility needs identified for those waterways.

The Russian River is one of the most commonly used waterways for non-motorized boaters in the North Coast region. It is popular

**Table 3.4**  
North Coast Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)

Frequently Used Waterway	Improved access	Maintain water level	Parking	Restrooms	Freshwater boat wash	Low-impact facilities	Boating trails	Docks	Floats/launch ramps	Beach area	Storage	Signage	Showers	Improved water quality	Picnic areas	Camping	Motor-boat free zones
1. Russian River	1	4	2	3	9		6			5		10				7	8
2. Petaluma River	1		3	2		7		5			6	9	4	8	10	11	
3. Humboldt Bay				✓	✓	✓	✓	✓	✓				✓		✓	✓	
4. Bodega Bay	✓		✓	✓		✓			✓	✓							
5. Lake Sonoma	1		3	2						✓	✓		✓				✓
6. Gualala River	✓		✓	✓		✓	✓		✓	✓		✓			✓	✓	
7. Stone Lagoon (North launch site)			✓	✓													
8. Eel River	1		2							✓				✓		✓	✓
9. Estero Americano	2		1	3													
10. Big Lagoon				✓			✓					✓					
11. Trinity River	✓											✓					
12. Sonoma Creek, Hudeman Slough, and adjacent waterways	✓		✓	✓				✓				✓			✓	✓	

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

### 3. Waterways and Facility Needs for Non-Motorized Boating

**Exhibit 3.1**  
**North Coast Region Waterway Map**



**Table 3.5**  
**North Coast Region Avoided Waterways and Reasons Identified by Non-Motorized Boaters (2006)**

Avoided Waterway	Lack of access	Overcrowding	Inconsistent water flows	Inadequate parking	Inadequate restrooms	Water conditions	Need for better signage	Poor water quality
1. Russian River	1		2	4	3			
2. Petaluma River	1				4		2	3
3. Humboldt Bay	✓				✓	✓		
4. Estero Americano				✓		✓		
5. Eel River	✓	✓	✓		✓	✓		
6. Rancheria Creek (Navarro River)	✓			✓	✓			

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

with sea and recreational kayakers, as well as with rafters and canoeists. One of the key issues raised by non-motorized boaters for this river was the need for additional access points. For example, on the 30 mile stretch between Cloverdale and Healdsburg, there are no access points to get on and off the river, and no camping along the way. This is an extremely long stretch for a day’s paddle. Other locations with access needs were Duncan Mills (between Monte Rio and Jenner) and Anderson Valley. Inadequate water flow levels on the Russian River were also a concern among many boaters. Finally, park managers identified a need for additional signage on the river for portage locations, and to identify publicly available launch sites.

The Petaluma River feeds into San Pablo Bay, and will have an increased need for camping areas as the San Francisco Bay Area Water Trail is developed. Current needs on the Petaluma River include picnic areas, and improved signage, particularly in adjacent navigable sloughs.

The Gualala River has over 20 miles of navigable waterway, and may be underutilized due to lack of access and publicity. Facility needs on the Gualala River include improved access along the main stem and South Fork, parking, restrooms, low-impact facilities, boating trails, beach areas, signage, picnic areas, and camping.

Sonoma County Regional Parks has operated the Hudeman Slough Boat Launch facility, owned by the State Wildlife Conservation Board, for several decades. There are several dozen miles of interconnected navigable tidal waterways between Sonoma Creek, Hudeman Slough, and the Napa River. Non-motorized boating in these areas has increased, and will likely continue to do so. Hudeman Slough is recognized in the San Francisco Bay Area Water Trail Plan.

**Table 3.5**, above, identifies waterways that survey respondents (statewide and regional random, and active-user Internet) avoided using because of facility needs or other problems.

## C. San Francisco Bay Area Region

The San Francisco Bay Area region is predominantly urban, with a population of 6.6 million. Historically devoted to trade, it has grown most in the manufacturing and service sectors. The large cities in the region include San Francisco, Oakland, and San Jose. San Francisco Bay provides numerous sheltered harbors adjacent to population centers. Inland waterways include the extensive Sacramento San-Joaquin Delta and many lakes. **Exhibit 3.2**, on the next page, illustrates major waterways in the San Francisco Bay Area region.

The focal point for non-motorized boating in the San Francisco Bay Area region is San Francisco Bay. The San Francisco Bay Area Water Trail Act, signed by the Governor in 2005, required the San Francisco Bay Conservation and Development Commission (BCDC) to develop a San Francisco Bay Area Water Trail Plan. The draft plan was published on July 6, 2007,<sup>16</sup> and was presented to the BCDC Commission and State Coastal Conservancy, in July 2007. The draft plan is a detailed document describing policies, guidelines, and procedures for implementing the San Francisco Bay Area Water Trail.

As described in the draft plan, “the vision for the San Francisco Bay Area Water Trail is a network of launch and landing sites that allows people in human-powered boats and beachable sail craft to enjoy the historic, scenic, and environmental riches of San Francisco Bay through continuous, multiple-day and single-day trips on the bay. The trail will promote safe and responsible use of the Bay, while protecting and increasing appreciation of its environmental resources through education and coordinated, strategic access to the Bay. Water trail managers will work with trail users and other stakeholders, and partner with shoreline managers and businesses to design, develop, and manage trail

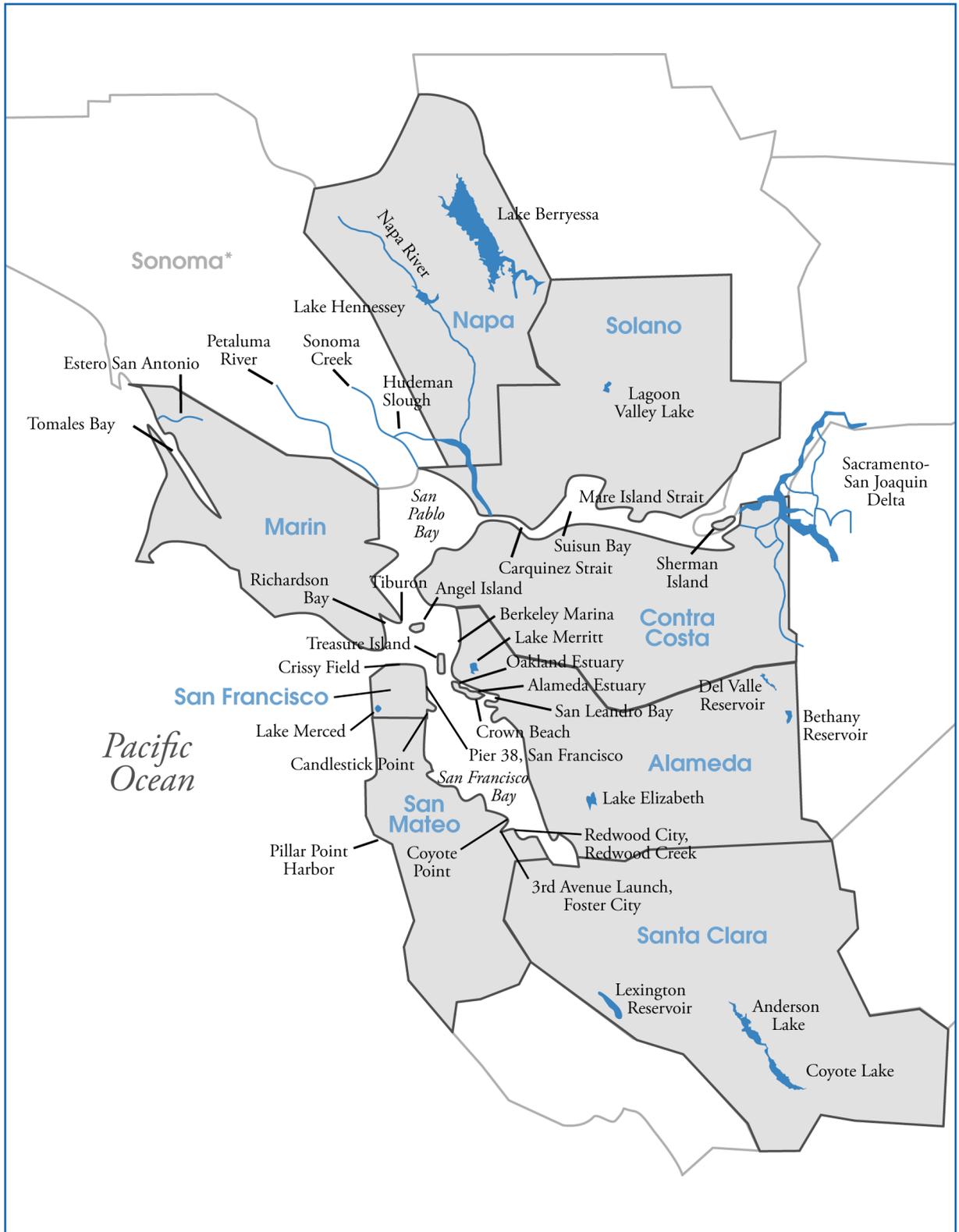
access that increases enjoyment of San Francisco Bay for generations to come.”<sup>17</sup>

The BCDC is the lead agency in developing the Water Trail Plan, while the State Coastal Conservancy will be the lead agency in implementing the plan. DBW is a managing partner in the development of the San Francisco Bay Area Water Trail. DBW has been integrally involved in the planning process, and will continue to work with these two agencies in implementing and funding aspects of the plan. The draft plan identifies eighty-nine (89) existing launch sites, seven (7) existing destinations, twelve (12) planned launch sites, and six (6) planned destinations.<sup>18</sup> Upgrades to increase capacity or provide access for new types of users are proposed at many of the existing sites. There are fifty-seven (57) high opportunity sites, defined as sites that “require minimal assessment, planning, management changes and improvements (i.e. signage only) on which initial implementation should be focused.”<sup>19</sup> Future non-motorized boating facilities within San Francisco Bay should be developed within the framework of the Water Trail Plan.

In addition to the Bay, there are other waterways within the San Francisco Bay Area region for which survey respondents and interest group participants identified facility needs. **Table 3.6**, on page 3-12, identifies these waterways and facility needs, including those in San Francisco Bay. Many survey respondents identified generic waterways, such as “Pacific Ocean” and “San Francisco Bay”.

Table 3-6 is divided into two sections. The top section of the table summarizes responses from kayakers and other paddling non-motorized vessels. The lower section of the table summarizes responses from sailboarders and kiteboarders. Sailboarding and kiteboarding are separated because they have unique facility needs and locations as compared to other types of non-motorized boating.

**Exhibit 3.2**  
**San Francisco Bay Area Region Waterway Map**



\* Sonoma County is within the North Coast Region; however, Sonoma County waterways on and around San Pablo Bay are included in the San Francisco Bay Area Water Trail Plan.

### 3. Waterways and Facility Needs for Non-Motorized Boating

**Table 3.6**  
**San Francisco Bay Area Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)**

Frequently Used Waterway	Improved access	Maintain water level	Parking	Restrooms	Freshwater boat wash	Low-impact facilities	Docks	Floats/launch ramps	Beach area	Storage	Signage	Showers	Improved water quality	Camping	Motor-boat free launch
Responses for Canoes, Kayaks, Inflatable Boats, Small Sailboats, Rowing Boats, and Other Boats															
1. San Francisco Bay	1		2	3	4		8	6	5			10	9	7	
2. Redwood City Area	4		1	3	7		9	8		5		2	6		
3. Lexington Reservoir		1	4	2	5							3			
4. Pacific Ocean	1		2	3											
5. Carquinez Strait	✓		✓	✓	✓			✓	✓						
6. Oakland Estuary	✓		✓	✓	✓			✓				✓	✓		✓
7. Lake Merced	✓		✓	✓			✓			✓					
8. Berkeley Marina	✓		✓	✓		✓	✓	✓		✓	✓				✓
9. Sacramento – San Joaquin Delta	✓		✓	✓				✓	✓				✓		
10. Redwood Creek			✓	✓	✓			✓		✓			✓		
11. Tiburon	✓														
12. Tomales Bay	✓		✓	✓	✓		✓	✓							
Responses for Sailboards and Kiteboards															
1. San Francisco Bay	1		2	3				6				4	5		
2. 3 <sup>rd</sup> Avenue Launch, Foster City	3		1	2					5			4			
3. Treasure Island	1		6	2	7			4	5		3				
4. Sherman Island	1		3	2					4						
5. Coyote Point	3		2	4				1	5						
6. Crissy Field	✓		✓	✓						✓		✓			

Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.

Of the 100-plus launch locations identified in the San Francisco Bay Area Water Trail Plan, there are only about sixteen locations that provide suitable wind and launch conditions for sailboarders (windsurfers) and kiteboarders. One of the most popular locations, Treasure Island, is no longer available to windsurfers and kiteboarders during its major redevelopment project. Regaining and improving access on Treasure Island is a high priority for this group of non-motorized boaters.

One concern was that the existing launch is dangerous, particularly for kiteboarders.

Parking was a key concern of sea kayakers in the San Francisco Bay Area region. There were two issues raised. The first was the need for overnight parking at launch facilities to facilitate multi-day boating trips. Many facilities do not allow overnight parking. A second issue was parking security, as it is reported by respondents that cars have been vandalized and burglarized while the owner is boating.

**Table 3.7**  
**San Francisco Bay Area Region Avoided Waterways and Reasons Identified by Non-Motorized Boaters (2006)**

Avoided Waterway	Lack of access	Overcrowding	Need for water break	Inadequate parking	Inadequate restrooms	Water conditions	Reckless boaters	Need for sand, beach area	Security/safety	Lack of camping
Responses for Canoes, Kayaks, Inflatable Boats, Small Sailboats, Rowing Boats, and Other Boats										
1. San Francisco Bay Area	1			3	2					4
2. Sacramento – San Joaquin Delta		2					1			
3. Alameda Estuary	1				2		3			
4. Lake Berryessa		2					1			
5. Berkeley Marina				1	2		3		4	
6. Estero San Antonio	2			1						
7. Tiburon	1									
8. Angel Island	1									
9. Pier 38, San Francisco			1							
Responses for Sailboards and Kiteboards										
1. Treasure Island	1			3	2					
2. 3 <sup>rd</sup> Avenue Launch, Foster City		2		1		3				
3. Candlestick Point	2					1			3	
4. Palo Alto Harbor	2			3		1				
5. Coyote Point	2					1		3		
6. Crown Beach, Alameda		1		2				3		
7. Point Emery	2				1					

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

Crissy Field, in San Francisco, was identified as an example of a location that satisfactorily meets the needs of a number of diverse user groups, including land-based and water-based activities. According to many area boaters, this location demonstrates the value of planning and designing to accommodate the needs of multiple user-groups, while minimizing conflicts between them.

**Table 3.7**, above, identifies waterways in the San Francisco Bay Area region that non-motorized boater respondents avoided using due to facility needs or other issues. In addition to these avoided waterways, there are some areas in the San Francisco Bay that require dredging, even to support non-motorized boating activities. For example, some boaters reported that the South Basin in Berkeley is silting in, as is the area around San Leandro Marina.

**Table 3.8**  
**Central Coast Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)**

Frequently Used Waterway	Improved access	Parking	Restrooms	Freshwater boat wash	Low-impact facilities	Boating trails	Docks	Floats/launch ramps	Beach area	Storage	Signage	Showers	Improved water quality	Picnic areas	Camping	Motor-boat free zone	Boater/kayaker safety rules
1. Pacific Ocean	✓	✓	✓			✓			✓	✓		✓	✓	✓	✓		
2. Monterey Bay		✓	✓				✓	✓		✓	✓		✓				
3. Morro Bay		✓	✓	✓				✓		1						✓	
4. Lake San Antonio		✓	✓				✓	✓							✓		
5. Santa Margarita Lake	✓	✓	✓				✓	✓	✓				✓			✓	
6. Carmel/Big Sur	✓	✓	✓			✓					✓	✓					
7. Avila Bay/Port San Luis		✓	✓	✓						✓	✓	✓		✓	✓		
8. Point Lobos	✓																
9. Moss Landing		✓				✓		✓			✓						
10. Pismo Beach	✓										✓						✓
11. Pacific Grove	✓		✓		✓			✓									
12. San Lorenzo River	✓										✓						

Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.

### D. Central Coast Region

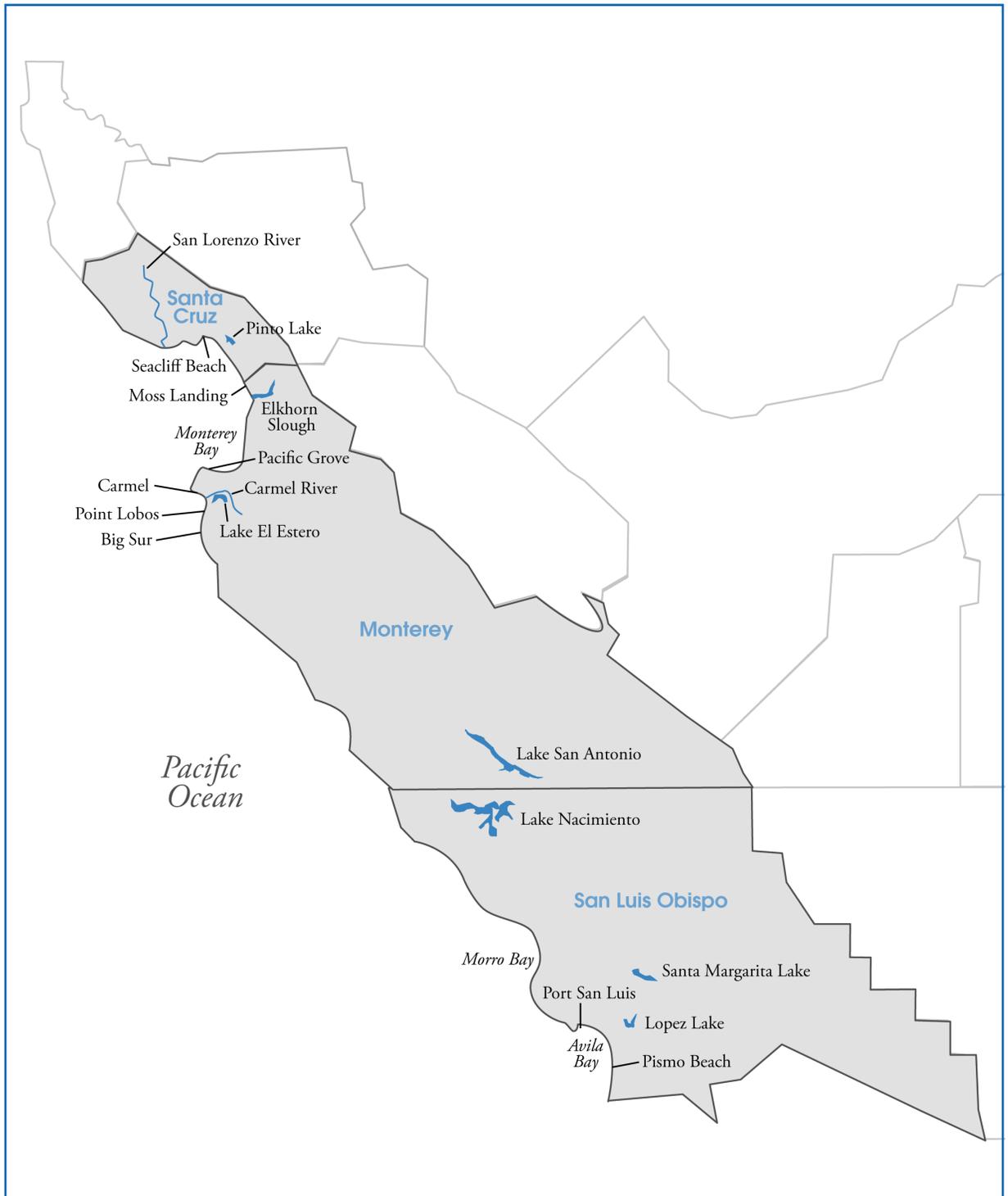
The Central Coast region, with a population of almost 950,000, is predominantly rural. It was historically devoted to agriculture, fisheries, and defense, but recently has seen strong growth in the tourism and service sectors. The medium-sized cities in the region are Santa Cruz, Salinas, Monterey, and San Luis Obispo. Its navigable waterways include two large inland lakes, a few smaller lakes, Monterey Bay, and Morro Bay.

**Exhibit 3.3**, on the next page, illustrates major waterways in the Central Coast region. **Table 3.8**, above, identifies frequently used waterways and facility needs in the Central Coast region.

One of the most frequently identified facility needs in this region was improved signage to clarify access and safety issues. There was also interest in a boating trails system to link Santa Cruz, Monterey, Pacific Grove, Carmel, and Moss Landing.

**Table 3.9**, on page 3-16, identifies Central Coast waterways that active-user and random survey respondents avoided using. Unlike many regions, none of the avoided waterways were identified by a large number of respondents. Most waterways listed in Table 3-7 were identified by only a few respondents, perhaps indicating that there are not significant problems on Central Coast region waterways.

**Exhibit 3.3**  
**Central Coast Region Waterway Map**



**Table 3.9**  
**Central Coast Region Avoided Waterways and Reasons Identified by Non-Motorized Boaters (2006)**

Avoided Waterway	Lack of access	Overcrowding	Inconsistent water flows	Inadequate parking	Inadequate restrooms	Reckless boaters	Security/safety	Need non-motorized zone
1. Big Sur	✓			✓	✓			
2. Lopez Lake	✓							
3. Carmel River	✓		✓	✓	✓			
4. Seacliff Beach	✓			✓	✓			
5. Elkhorn Slough					✓		✓	
6. Lake Nacimiento		✓		✓		✓		✓
7. San Lorenzo River	✓							

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

### E. South Coast Region

The South Coast region is predominantly urban, with 14.6 million people and a diverse metropolitan economy. The large cities in the region include Santa Barbara, Oxnard-Ventura, Los Angeles and Anaheim metropolitan areas. Coastal waters are warm and sheltered by the orientation of the coast and the presence of offshore islands, but there are no natural harbors. Artificial harbors, such as the Los Angeles-Long Beach Harbor, which is largely pre-empted by shipping, are few and small. There are few lakes in the region.

**Exhibit 3.4**, on the next page, illustrates major waterways in the South Coast region.

Much of the non-motorized boating in Southern California takes place from beaches. Beaches are typically managed by cities, counties, and State Parks. Rules regarding launching non-motorized boats vary for each particular beach. Clear policies and signage would benefit both non-motorized boaters and other beachgoers. Conflicts between surfers (using surfboards) and surf kayakers were a concern on several South

Coast beaches. As surf kayaking is increasing in popularity, so are the number of conflicts between surfers and surf kayakers related to who has priority while waiting to catch waves in the surf lineup. This was another area where rules and enforcement were reportedly often unclear and inconsistent. For example, active-user survey respondents and interest group meeting participants noted that at some beaches, surf kayakers were discouraged or not allowed, while surfing with a surfboard was an approved activity.

When non-motorized boating is allowed on a particular beach, it is important to have a safe location for landing non-motorized boats, away from those playing in, or close to, the water. Kiteboarding poses particular hazards to beachgoers, as most people are unaware of the potential for injury when stepping in the path of a taut kite line. Some Southern California beaches have restricted kiteboarding on weekends, or limited the number of locations where kiteboarding is allowed.

**Exhibit 3.4**  
**South Coast Region Waterway Map**



**Table 3.10**  
**South Coast Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)**

Frequently Used Waterway	Improved access	Parking	Restrooms	Freshwater boat wash	Boating trails	Docks	Floats/launch ramps	Beach area	Storage	Signage	Showers	Improved water quality	Picnic areas	Camping	Motor-boat free zone
1. Pacific Ocean (including Catalina Island)	✓	✓	✓	✓	✓	✓		✓	✓			✓	✓	✓	✓
2. Marina del Rey	5	8				4	6		1		3	2			7
3. Mother's Beach			1	5					4		2	3			6
4. Alamitos Bay	8	4	2	5				7			3	1			6
5. Naples/ Long Beach		2	3						4		5	1			
6. Newport Harbor	1	3	2	8				6	7		5	4			
7. Cabrillo Beach		✓		✓				✓			✓				
8. Huntington Harbor		✓	✓					✓							
9. Santa Monica Bay	✓	✓		✓					✓						
10. Dana Point Harbor		✓		✓					✓						
11. Malibu Beach									✓		✓				
12. Channel Islands Harbor			✓	✓	✓				✓	✓		✓			

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

The South Shore Launch Ramp in Long Beach is reportedly an example of a well-designed launch ramp for non-motorized boats. The facility provides a circular drive-up area with ramp access into the sheltered harbor. The area is very popular with fishing kayakers. Seal Beach at First Street has a facility that works well for windsurfers, with a grassy rigging area. About ten years ago, the Southern California Windsailing Association worked with the City of Seal Beach to fund and provide the labor to develop the site.

There is growing interest among sea kayakers in Southern California to develop a Channel Islands Water Trail. Channel Islands is a National Park that consists of a chain of islands about ten miles from Ventura Harbor. While kayakers can land on the islands, camping is limited, and not available

near the water and/or within a normal day's paddle. As part of a long-term planning process, the National Park Service is reportedly considering the creation of a Channel Islands water trail. Many Southern California non-motorized boaters would also like to see better mapping and/or development of a water trail along the Southern California coast, linked with access points and camping.

Two areas of concern that were more prevalent in the South Coast region than any other region were (1) water quality, and (2) overcrowding. These concerns reflect the dense population of the region and the small number of waterways. **Table 3.10**, above, identifies commonly used waterways and facility needs in the region. **Table 3.11**, on the next page, identifies South Coast region waterways that survey respondents avoided using.

**Table 3.11**  
**South Coast Region Avoided Waterways and Reasons Identified by Non-Motorized Boaters (2006)**

Avoided Waterway	Lack of access	Overcrowding	Inconsistent water flows	Inadequate parking	Inadequate restrooms	Poor water quality	Reckless boaters
1. Newport Harbor	✓	1		✓	✓	✓	2
2. Marina del Rey	5	3		4		2	1
3. Mother's Beach/Long Beach	2					1	
4. Piru Creek and Piru Lake	1	4	3	2			5
5. Ballona Creek	✓		✓	✓		1	
6. Malibu Beach	✓	✓	✓	✓		✓	
7. Lake Casitas	✓	✓					✓
8. Pyramid Lake	✓					✓	✓
9. Santa Barbara Harbor and Beaches	✓	✓		✓	✓		

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

## F. San Diego Region

The San Diego region is predominantly urban, with a population of three (3) million and a large rural hinterland. San Diego is the principal large city in the region which, though historically devoted to trade and defense, has recently become somewhat diversified. San Diego Bay and Mission Bay provide extensive protected water near population centers, and there are numerous small lakes in the interior part of the region, although many have use restrictions. **Exhibit 3.5**, on the next page, illustrates major waterways in the San Diego region.

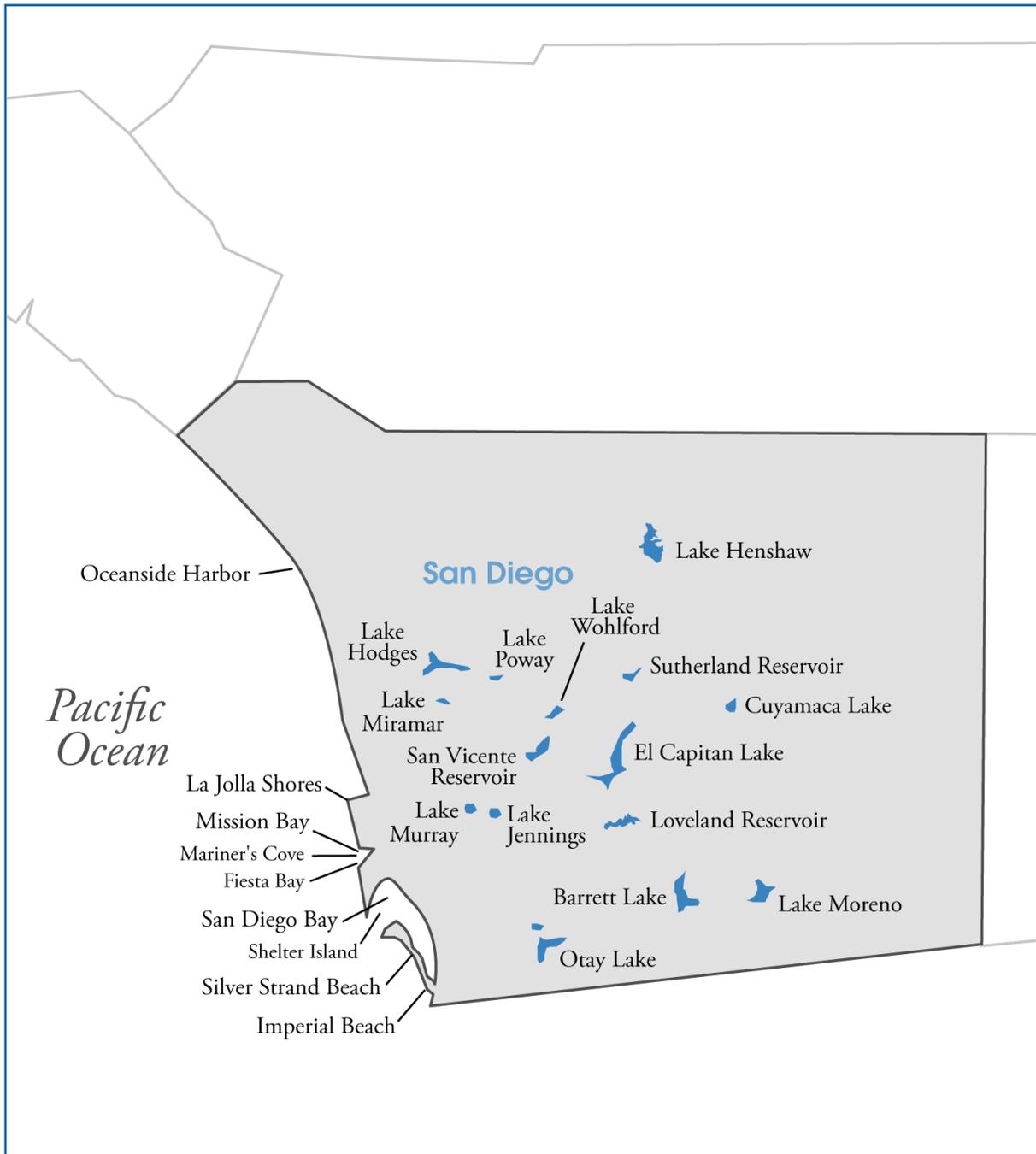
The City of San Diego Water Department operates an extensive system of lakes east of San Diego.<sup>20</sup> These lakes provide water to the City, as well as recreational opportunities. The rules for water contact, particularly for windsurfing, canoeing, and kayaking, vary among the lakes. Some of these lakes do not allow canoeing and kayaking, except on scheduled paddle days.

Most of the non-motorized boating in the San Diego region takes place in Mission Bay, San Diego Bay, and several of the lakes just east of San Diego. **Table 3.12**, on page 3-21, identifies waterways and facility needs in the region. **Table 3.13**, following Table 3.12, summarizes waterways that respondents avoided within the San Diego region.

## G. Northern Interior Region

The Northern Interior region, historically devoted to agriculture and forestry, is predominantly rural, with a population of 91,000. It contains hundreds of small to medium-sized lakes and numerous rivers. Whitewater rivers include the Klamath, Salmon, Scott, and Upper Sacramento. **Exhibit 3.6**, on page 3-22, illustrates the major waterways in the Northern Interior region.

Exhibit 3.5  
San Diego Region Waterway Map



**Table 3.12**  
**San Diego Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)**

Frequently Used Waterway	Improved access	Maintain water level	Parking	Restrooms	Freshwater boat wash	Kiteboarding area	Floats/launch ramps	Beach area	Storage	Signage	Showers	Improved water quality	Picnic areas	Motor-boat free zone	Boater/kayaker safety rules
1. Mission Bay	6		1	4	5			8	7	10	9	3		2	11
2. Pacific Ocean	2		1	6				3	5		4				
3. San Diego Bay	✓		✓	✓	✓			✓	✓			✓		✓	✓
4. Lake Hodges	✓	✓	✓	✓	✓		✓					✓	✓		
5. Oceanside Harbor	✓		✓	✓					✓					✓	
6. La Jolla Shores	✓		✓						✓	✓		✓		✓	
7. Silver Strand Beach						✓									

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

**Table 3.13**  
**San Diego Region Avoided Waterways and Reasons Identified by Non-Motorized Boaters (2006)**

Avoided Waterway	Lack of access	Over-crowding	Inadequate parking	Inadequate restrooms	Poor water quality	Reckless boaters	Launch Fees
1. Mission Bay		2	4		3	1	
2. San Diego Bay	2				1	3	
3. Lake Hodges	1		2	3			
4. Lake Murray							✓

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

Whitewater boating, particularly guided rafting trips, make up a significant portion of non-motorized boating activity in the Northern Interior region. In addition, many residents participate in kayaking and canoeing, typically between the warmer months of May through October.

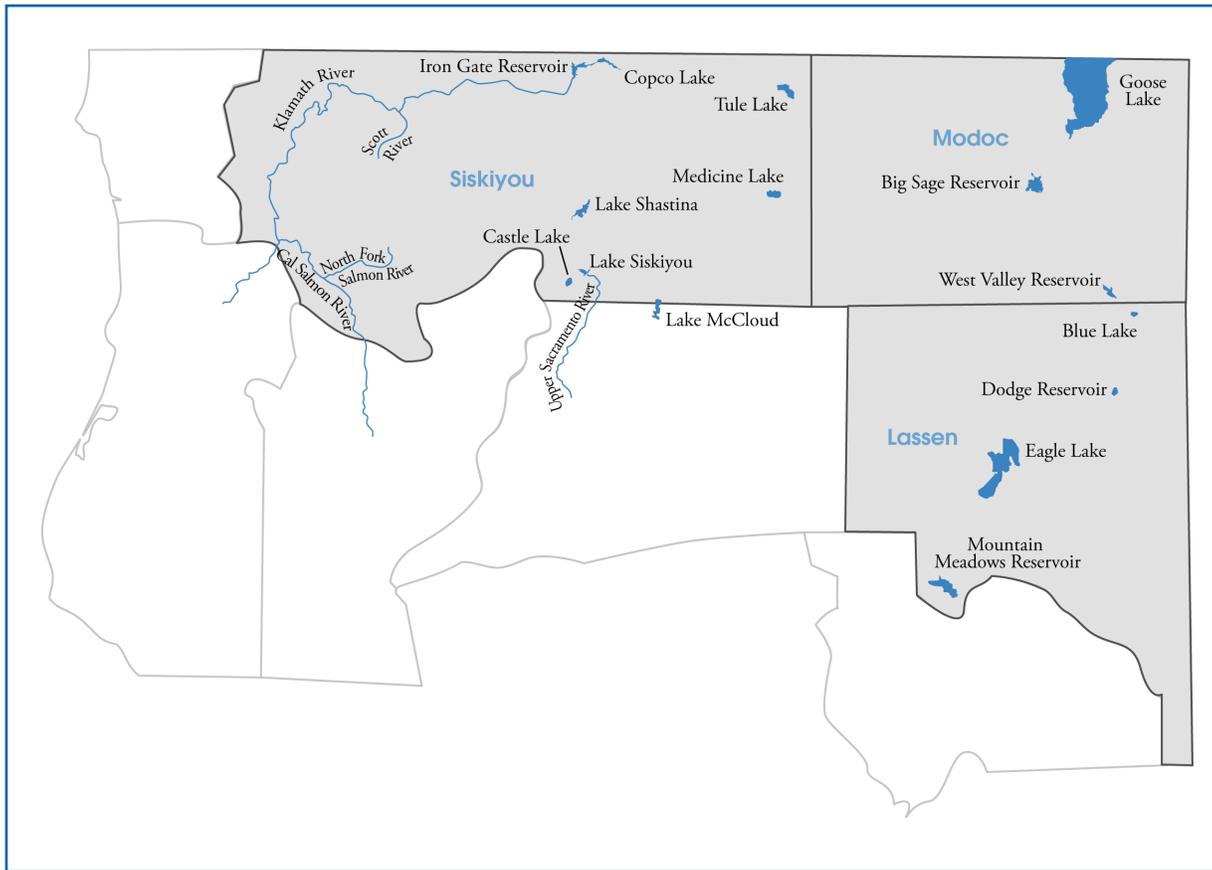
**Table 3.14**, on the next page, identifies waterways and facility needs in the Northern Interior region. Some commercial outfitters noted the need for an improved take-out ramp on the Scott River, up river of Scott Bar. The current take-out ramp is steep and treacherous. Outfitters

also identified the need for a take-out ramp on the Upper Sacramento River at Mosquito Creek, where again the walk-out is steep and rocky.

There was only one Northern Interior waterway that survey respondents avoided, the Klamath River. While this was also one of the most used waterways, there were several problems identified. The most significant problem was poor water quality, due to agricultural run-off into the river. Other problems included dangerous access roads, vandalism of parked cars, and inadequate parking and restrooms.

### 3. Waterways and Facility Needs for Non-Motorized Boating

**Exhibit 3.6**  
**Northern Interior Region Waterway Map**



**Table 3.14**  
**Northern Interior Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)**

Frequently Used Waterway	Improved access	Maintain water level	Parking	Restrooms	Boating trails	Floats/launch ramps	Signage	Improved water quality	Enforcement of Life Jackets	Improved road conditions	Whitewater park
1. Lake Siskiyou	1			3	5	2	4				
2. Klamath River	6	3			1	2		4		7	5
3. Eagle Lake				1	2	3					
4. Castle Lake						✓					
5. Lake McCloud	✓					✓					
6. Upper Sacramento	✓								✓		
7. Cal Salmon River	✓		✓							✓	

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

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## H. Sacramento Basin Region

The Sacramento Basin region, with a population of 2.9 million, is an intensively developed agricultural area served by the Sacramento metropolitan area, and several medium-sized cities, including Redding and Chico. It was historically devoted to trade, government, agriculture, and defense, and has recently grown most in the service sector. The region is traversed for most of its length by the Sacramento River, and has dozens of small lakes and several large ones, including Lakes Shasta, Almanor, and Oroville. The region includes Lake Tahoe and many mountain lakes, as well as several major whitewater rivers, including the North, Middle, and South Forks of the American River, the Yuba River, and the Feather River. The South Fork of the American River is one of the most popular whitewater destinations in the United States.

**Exhibit 3.7**, on the next page, illustrates the major waterways in the Sacramento Basin region. **Table 3.15**, on page 3-25, identifies waterways and facility needs in the Sacramento Basin region.

In addition to the waterways identified in Table 3.15, non-motorized boaters in the Sacramento Basin utilize many of the numerous lakes and reservoirs scattered throughout the region. Boaters using these waterways are primarily participating in flatwater paddling with inflatable boats, recreational kayaks, and canoes.

Lakes used by non-motorized boaters included: Blue Lake, Boca Reservoir, Bucks Lake, Gold Lake, New Hogan Lake, Jenkins Lake, Icehouse Lake, Sugar Pine Lake, Silver Lake, Stonyford Reservoir, Union Valley Reservoir, Lake Almanor, Lake Oroville, and Lake Shasta. Facility needs for these boaters included: improved signage to clearly identify launch areas, access to the water, parking, and restrooms. On the larger lakes and reservoirs, many survey respondents hoped that motorboat-free zones could be established.

Special interest group participants identified several specific locations for non-motorized boating facility improvements in the Sacramento Basin region. At Whiskeytown, the need for more parking was an issue at Whiskey Creek. And at Whiskey Creek and Oak Bottom locations, there were needs for non-motorized boat beach launching. The National Park Service, who manages the lake, is working to develop an aquatic center. Whiskeytown is also on a list of lakes for which the National Park Service is considering setting a 5 mph speed limit, although no changes are likely in the immediate future.

Boaters also identified a need for non-motorized launching on Lake Red Bluff, increased parking on the Fall River, improved safety signage at Turtle Bay on the Sacramento River, access signage on Trinity Lake, and river access on the Sacramento River in Redding under the Cypress Avenue bridge.

Paddling groups, the County of Lake, and the National Park Service are working to develop water trails and public access maps on Clear Lake. They are currently developing a series of brochures for a Clear Lake water trail. There are six separate draft maps available for different regions of the lake, and the organizations are developing a paddling map for Lake County.<sup>21</sup>

The Middle Fork of the American River, which stretches from Folsom Lake up to the old Highway 40 bridge in Auburn, is an area that will have facility needs in the near future. California State Parks will open this stretch of river, which would have been submerged by the Auburn Dam, in 2008. This stretch of the Middle Fork is easy to float and will likely attract a large number of rafters and inner tubers. Initially, State Parks may not allow commercial use on the river.

### 3. Waterways and Facility Needs for Non-Motorized Boating

**Exhibit 3.7**  
**Sacramento Basin Region Waterway Map**



**Table 3.15**  
**Sacramento Basin Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)**

Frequently Used Waterway	Improved access	Maintain water level	Parking	Restrooms	Low impact facilities	Boating trails	Docks	Floats/launch ramps	Beach area	Storage	Signage	Showers	Improved water quality	Camping	Motor-boat free zone	Whitewater park
1. South Fork of the American River	2	1	4	5	6								8	7		3
2. American River	2	1	4	5	7	8								6		3
3. Lake Natoma	4		2	1			6		5						3	
4. Lake Tahoe	1					2		5						3	4	
5. North Fork of the American River	✓	✓	✓	✓	✓											
6. Sacramento River	✓		✓	✓				✓								
7. North Fork of the Feather River	✓	✓	✓	✓												
8. Whiskeytown Lake	✓		✓	✓			✓								✓	
9. Port of Sacramento				✓			✓					✓			✓	
10. Trinity River	✓	✓	✓		✓											
11. Trinity Lake			✓	✓						✓	✓				✓	
12. Cache Creek	✓		✓	✓												
13. Clear Lake	✓	✓	✓		✓	✓	✓									
14. Truckee River				✓												
15. Folsom Lake	✓					✓	✓	✓	✓			✓	✓		✓	
16. Middle Fork of the Feather River					✓											

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

The Lower American River receives heavy commercial and individual use, including self-guided inflatable boats, canoes, whitewater kayaks, and toy boats. There are large, well designed put-ins and take-outs at Watt and Howe Avenues with adequate restrooms. However, there are no restroom or trash facilities along the eight mile stretch of river in between these two locations, and no access between Howe Avenue and Discovery Park.

California rivers, particularly rivers within the Sacramento Basin and Central Valley regions, offer some of the best whitewater boating in the country. There are a number of facility improvements to support whitewater boating that survey respondents and special interest group meeting participants identified. Four issues apply to whitewater boating in general:

1. *Maintaining water flows* – If there is not adequate water flowing through a river, there is no whitewater boating. Rainfall and snowpack are important, but most California river flows are controlled by dams. Federal Energy Regulatory Commission (FERC) dam relicensing projects involve multi-year permitting processes that must take into account recreational use on the rivers, and reservoirs, that are part of any hydropower project.
2. *Establishing one or more whitewater parks within California* – There was strong consensus among whitewater boaters that California could easily support at least one whitewater boating park, similar to the facility in Reno, Nevada. Moving this concept to reality would require coordination among the various river managers, cities, counties, State Parks, DBW, and federal agencies involved to identify a location, secure funding, plan, and implement. Potential whitewater park locations include Natomas Flats on the American River (below the Nimbus Dam and near the California State University Sacramento Aquatic Center), and Riverside Whitewater Park on the Kern River.
3. *Improving parking security at river put-in and take-out locations* – A key problem identified by whitewater (and sea) kayakers was vehicle break-ins while boaters are on the water.<sup>b</sup> The problem is worse when cars are parked along the roadsides in remote areas. According to Sacramento area kayakers participating in an interest group meeting, security at the Greenwood Creek parking site on the South Fork of the American River has improved significantly since the parking lot and access location were upgraded. With the upgrades, other land- and water-based recreationists are parking in, and using, the facility, reducing opportunities for vandals. More frequent ranger patrols also reduce break-ins. Sacramento area kayakers also

noted that another improvement for parking security would be to simply place signs at parking areas to identify who to call in the event of a break-in. Because multiple agencies have jurisdiction over the land and water surrounding many rivers, boaters often do not know who they should contact in the event of an automobile break-in.

4. *Providing reasonably priced shuttle services during busy periods on certain rivers* – Parking at put-in and take-out locations is often inadequate; however, in many cases there is simply no place to add parking at the river site. Developing off-site parking in suitable locations nearby, with shuttle services to the river, would help alleviate the parking shortages. This alternative may offer a lower-cost, and less environmentally damaging, alternative to providing parking immediately adjacent to a river.

Within the Sacramento Basin region, special interest group participants and commercial survey respondents identified a number of specific facility needs on whitewater rivers. One of the highest priority needs identified was access road improvements, parking, and restrooms at Yankee Jim's, on the North Fork of the American River. This location serves as both a put-in and take-out for two runs along the river, and has high traffic volume. Yankee Jim's is a location where the geography might make it difficult to add parking. However, an alternative might be to develop off-site parking and a shuttle. According to Sacramento area kayakers participating in an interest group meeting, on the North Fork of the American, narrow and bumpy conditions on Ponderosa Road, on the way to the Shirt Tail take-out, make this drive dangerous.

While the South Fork of the American River generally has well-developed facilities, some survey respondents identified facility needs such as: composting toilets at put-ins and take-outs; wheelchair access at Chili Bar, Marshall Gold, and Camp Lotus; and parking at Salmon Falls.

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<sup>b</sup> Although it was identified as a problem by a number of respondents, the random and active-user surveys did not specifically mention parking security. Thus, it is possible that this problem was underreported.

**Table 3.16**  
**Sacramento Basin Region Avoided Waterways and Reasons Identified by Non-Motorized Boaters (2006)**

Avoided Waterway	Lack of access	Overcrowding	Inconsistent water flows	Inadequate parking	Inadequate restrooms	Poor water quality	Reckless boaters	Launch Fees	Need non-motorized zone
1. Folsom Lake		✓					✓		✓
2. Lower American River		✓				✓	✓		
3. Shasta Lake		✓					✓		
4. North Fork Feather River	✓		✓	✓					
5. Cosumnes River	✓			✓					
6. Lake Oroville	✓			✓			✓		
7. Lake Almanor		✓			✓		✓		
8. South Fork of the American River		✓					✓		
9. North Fork of the American River				✓	✓				
10. Sacramento River	✓					✓	✓		
11. Balls Ferry			✓		✓				
12. Lake Tahoe	✓	✓		✓			✓	✓	
13. Cache Creek			✓		✓	✓			
14. South Fork Yuba River			✓	✓	✓				

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

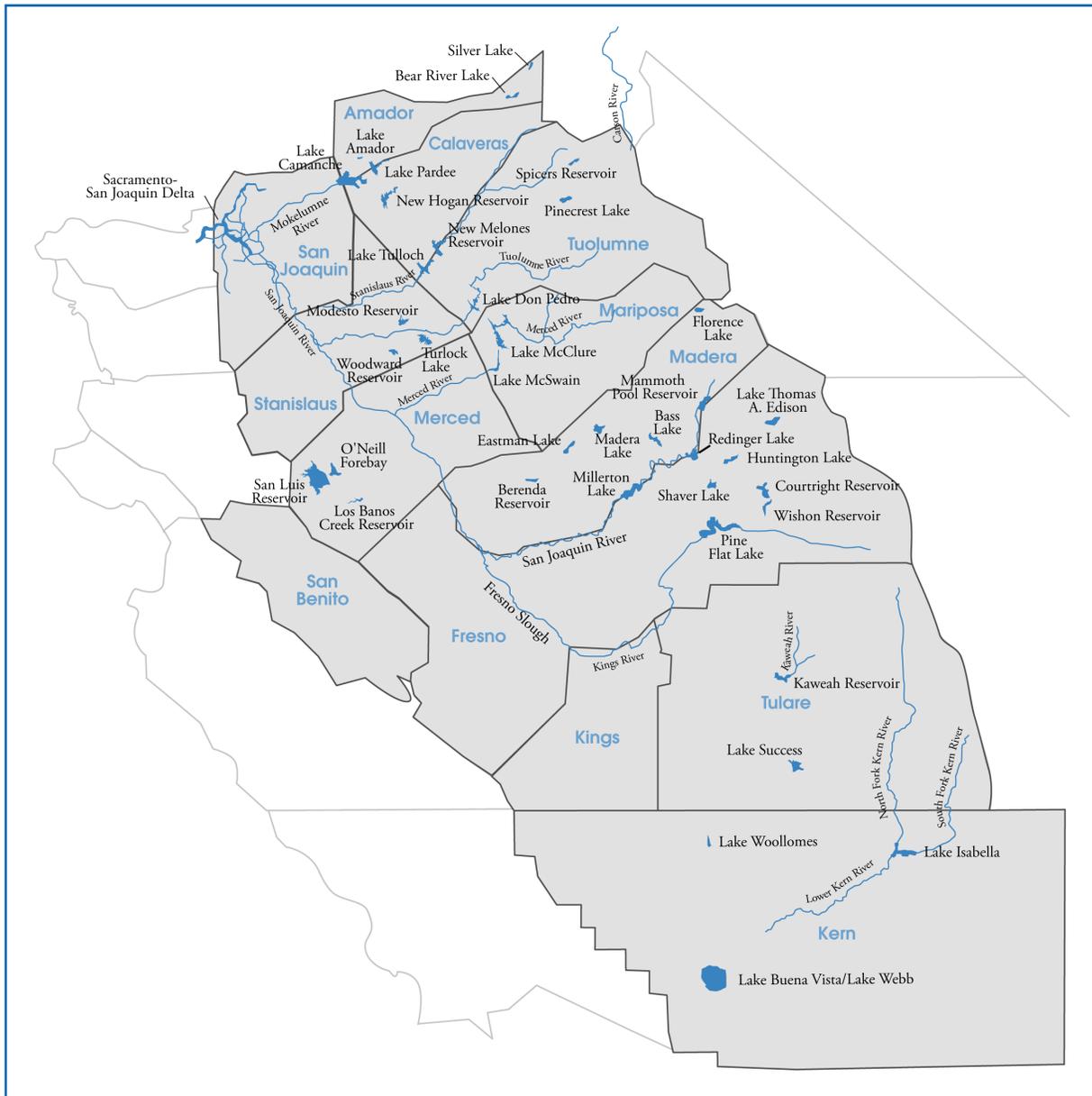
There are two locations on the North Fork of the Feather River with facility needs, Cresta Road and Rock Creek. Under the recently completed PG&E hydropower relicensing agreement, there is only a short time period when enough water is released on the river for whitewater boating. During these time periods when the river is flowing, there are a large number of boaters on the North Fork of the Feather River. At both the Cresta Road and Rock Creek put-ins, the trails down to the water are steep and hazardous. In addition, at Rock Creek boaters must park across Highway 70, and carry their boats and gear across the highway.

Parking is an issue on the Cosumnes River, near Highways 49 and 16. There is no parking within one quarter mile of the put-in or take-out locations on the river. As much of the land

alongside this river is privately owned, there are also trespass issues at a location that requires portaging in order to safely navigate the river.

**Table 3.16**, above, identifies avoided waterways in the Sacramento Basin region. With the exception of the Lower American River, which is known for rafting and tube floating, many of the avoided waterways were the larger reservoirs, which are widely used for motorized boating. On the Lower American and South Fork of the American, the issue of reckless boaters refers to other non-motorized boaters (or floaters). On the reservoirs, the issue of reckless boaters refers to motorized boats and personal watercraft. Whitewater rivers in the region with difficult parking or access were also among the avoided waterways identified by many boaters.

**Exhibit 3.8**  
**Central Valley Region Waterway Map**



## I. Central Valley Region

Like the Sacramento Basin, but with a larger (and rapidly growing) population of four (4) million, the Central Valley region is an intensively developed agricultural area served by several cities, including Stockton, Modesto, Fresno, and Bakersfield. This region was historically devoted to agriculture, petroleum, and defense, and

recently has grown in the service sector. Crossed by the San Joaquin River, the Central Valley region has many lakes and reservoirs, and several whitewater rivers including the Kings River, Kern River, Tuolumne River, Merced River, and Kaweah River.

**Exhibit 3.8**, above, illustrates the major waterways in the Central Valley region, while

**Table 3.17**, below, identifies waterways and facility needs for the Central Valley region.

**Table 3.18**, on the next page, identifies avoided waterways in the Central Valley Region.

Like the Sacramento Basin region, there are two major types of non-motorized boating: (1) recreational paddling in the many Central Valley lakes, reservoirs, and calmer rivers; and (2) whitewater boating on Central Valley rivers. Survey respondents did not identify any single lake or group of lakes for non-motorized boating, rather, respondents used a wide number of lakes throughout the region. Thus, with only one or two respondents identifying facility needs at any particular lake, it was difficult to identify those with the greatest needs. For whitewater rivers, there was consensus among a number of respondents regarding specific improvements on certain rivers in the region.

The Tuolumne River is a federally designated Wild and Scenic River that offers nationally recognized Class IV and V rapids. According to several outfitters and active-user survey respondents, the put-in and take-out locations on this river are in bad condition, making carrying boats in and out difficult. In addition, there have been problems with automobile break-ins and vandalism of restrooms. There was strong consensus among commercial and private whitewater boaters that developing facilities on this river should be a high priority. There are three locations with facility needs: (1) a boat launch ramp at Lumsden Road (Meral's Pool); (2) a safer take-out at Wards Ferry Road; and (3) restrooms and a trail to the water on Cherry Creek/Upper Tuolumne River. The Forest Service is working to develop facilities, but there is limited funding for planning, and progress has been slow. The Tuolumne River Trust has also completed some work at Ward's Ferry take-out.

**Table 3.17**  
**Central Valley Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)**

Frequently Used Waterway	Improved access	Maintain water level	Parking	Restrooms	Low impact facilities	Boating trails	Docks	Floats/launch ramps	Beach area	Picnic areas	Camping	Motor-boat free zone	Whitewater park
1. Kern River	3	1	4	5									2
2. Tuolumne River	2	1	3	4	5						6		
3. Kings River	1	4	3	2		5	6						
4. Bear River Lake	✓		✓	✓		✓							
5. Mokulumne River	✓	✓	✓	✓	✓								
6. Sacramento – San Joaquin Delta	✓		✓	✓		✓					✓		
7. Lake Isabella	✓	✓	✓	✓	✓				✓	✓		✓	
8. New Melones Reservoir	✓		✓	✓	✓	✓						✓	
9. Bass Lake (Madera County)	✓		✓	✓				✓	✓				
10. Silver Lake (Amador County)	✓	✓		✓								✓	
11. Stanislaus River	✓	✓											
12. Merced River	✓		✓	✓									

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

**Table 3.18**  
**Central Valley Region Avoided Waterways and Reasons Identified by Non-Motorized Boaters (2006)**

Avoided Waterway	Lack of access	Overcrowding	Inconsistent water flows	Inadequate parking	Inadequate restrooms	Poor water quality	Reckless boaters
1. San Joaquin River	✓		✓	✓		✓	
2. Stanislaus River			✓			✓	✓
3. New Melones Reservoir	✓	✓					✓
4. Sacramento-San Joaquin Delta	✓	✓		✓			✓
5. Bass Lake		✓					✓
6. Bear River Lake	✓		✓		✓		✓
7. Kern River	✓		✓	✓			
8. Kaweah Reservoir	✓		✓	✓			
9. Merced River	✓		✓	✓			

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

According to several outfitters, another high-priority whitewater facility need in the Central Valley region is located on the Kings River, where there is need for a boat launch at the Garnet Dike put-in. This is another location where getting people and boats down to the water is difficult. The access road along the Kings River is also in need of improvement. Similar to the Tuolumne River, the Forest Service is aware of the problems, and facility improvements are currently in the environmental planning stage.

On the Kern River, located near Bakersfield, survey respondents identified the need for a launch ramp with a boat slide and/or stairs at the put-in near Johnsondale Bridge. Respondents also identified a need for restrooms at river access points (with the exception the wilderness area portion of the river), as well as established campsites on the Forks of the Kern, which is a multi-day rafting trip. The Kern River Alliance, a non-profit group in the region, is working toward developing a whitewater park along one stretch of the Kern River.

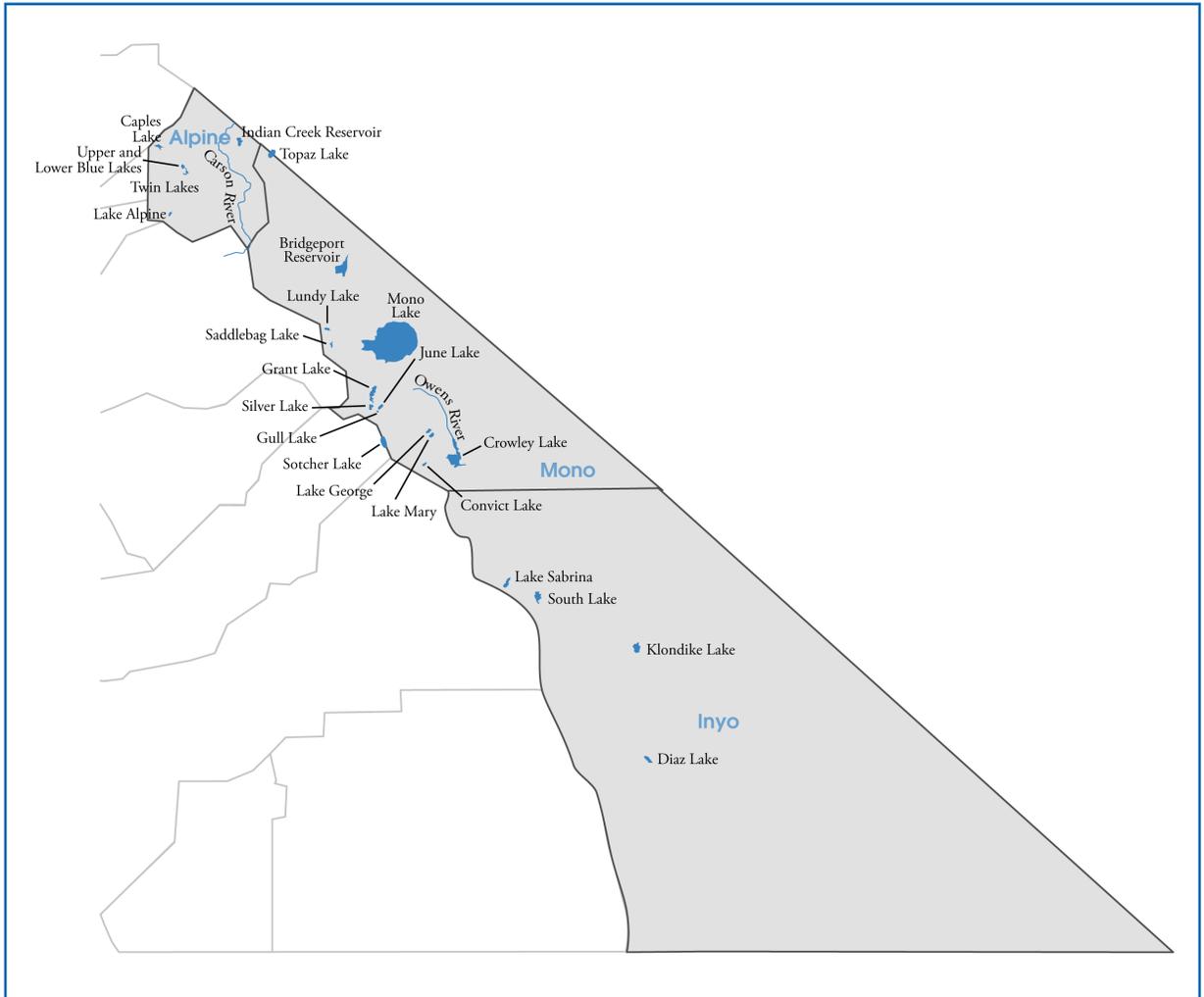
The Mokelumne River offers both easy (Class I and II) and challenging (Class IV) rapids. Improved access to the Class I and II portions, such as restrooms and parking along Middle Bar Road, would reportedly provide new boating opportunities for beginning-level rafting and recreational kayaking.

## J. Eastern Sierra Region

The Eastern Sierra region is sparsely populated, with 33,000 people. It was historically devoted to mining and forestry, and now is primarily supported by tourism. Its terrain is mountainous but contains lakes of all sizes. Boating of any kind is largely curtailed during the winter months. **Exhibit 3.9**, on the next page, illustrates the major waterways in the Eastern Sierra region.

Special interest group participants in the Eastern Sierra region identified several facility issues on local waterways. Many boaters cited the need for a pamphlet that identifies access points on the numerous small lakes in the region, particularly in the Mammoth Lakes area. Specific access points and improved signage would be beneficial on area lakes.

**Exhibit 3.9**  
**Eastern Sierra Region Waterway Map**



Respondents identified a need for more access points along the Owens River. Special interest group meeting participants also identified a need for National Weather Service recreation forecasts for lakes in the region such as Topaz Lake, Crowley Lake, and Mono Lake. Boating on these large lakes can quickly become hazardous in bad weather. However, there is not adequate warning about weather conditions for boaters, such as there is on Lake Tahoe.

**Table 3.19**, on the next page, identifies waterways and facility needs in the Eastern Sierra

region. **Table 3.20**, following Table 3.19, identifies avoided waterways in the region.

### **K. Southern Interior Region**

The Southern Interior region is hot and arid with extensive unpopulated areas. Its population of 4.1 million is mostly concentrated in the San Bernardino-Riverside area, although development is moving further east. The region was historically devoted to mining, trade, and manufacturing, but it has recently grown in the service sector as it merged with the greater Los Angeles metropolitan complex. The

### 3. Waterways and Facility Needs for Non-Motorized Boating

**Table 3.19**  
**Eastern Sierra Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)**

Frequently Used Waterway	Improved access	Parking	Restrooms	Docks	Floats/launch ramps	Improved water quality	Motorboat free zone	Remove trees & hazards
1. Crowley Lake			✓				✓	
2. Topaz Lake			✓					
3. Owens River	✓					✓		✓
4. Twin Lakes	✓	✓		✓	✓			
5. Sotcher Lake	✓				✓			

Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.

**Table 3.20**  
**Eastern Sierra Region Avoided Waterways and Reasons Identified by Non-Motorized Boaters (2006)**

Avoided Waterway	Lack of access	Inconsistent water flows	Inadequate parking	Need freshwater boat wash	Launch Fees
1. Crowley Lake					✓
2. Mono Lake	✓		✓	✓	
3. Owens River		✓			

Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.

**Table 3.21**  
**Southern Interior Region Facility Needs on Key Waterways Identified by Non-Motorized Boaters (2006)**

Frequently Used Waterway	Improved access	Maintain water level	Parking	Restrooms	Freshwater boat wash	Boating trails	Grassy area	Signage	Improved water quality	Camping	Motorboat free zone
1. Lake Perris	1	3							4		2
2. Big Bear Lake	✓						✓				
3. Colorado River	✓	✓	✓	✓		✓				✓	
4. Lake Elsinore	✓	✓	✓	✓	✓			✓			✓

Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.

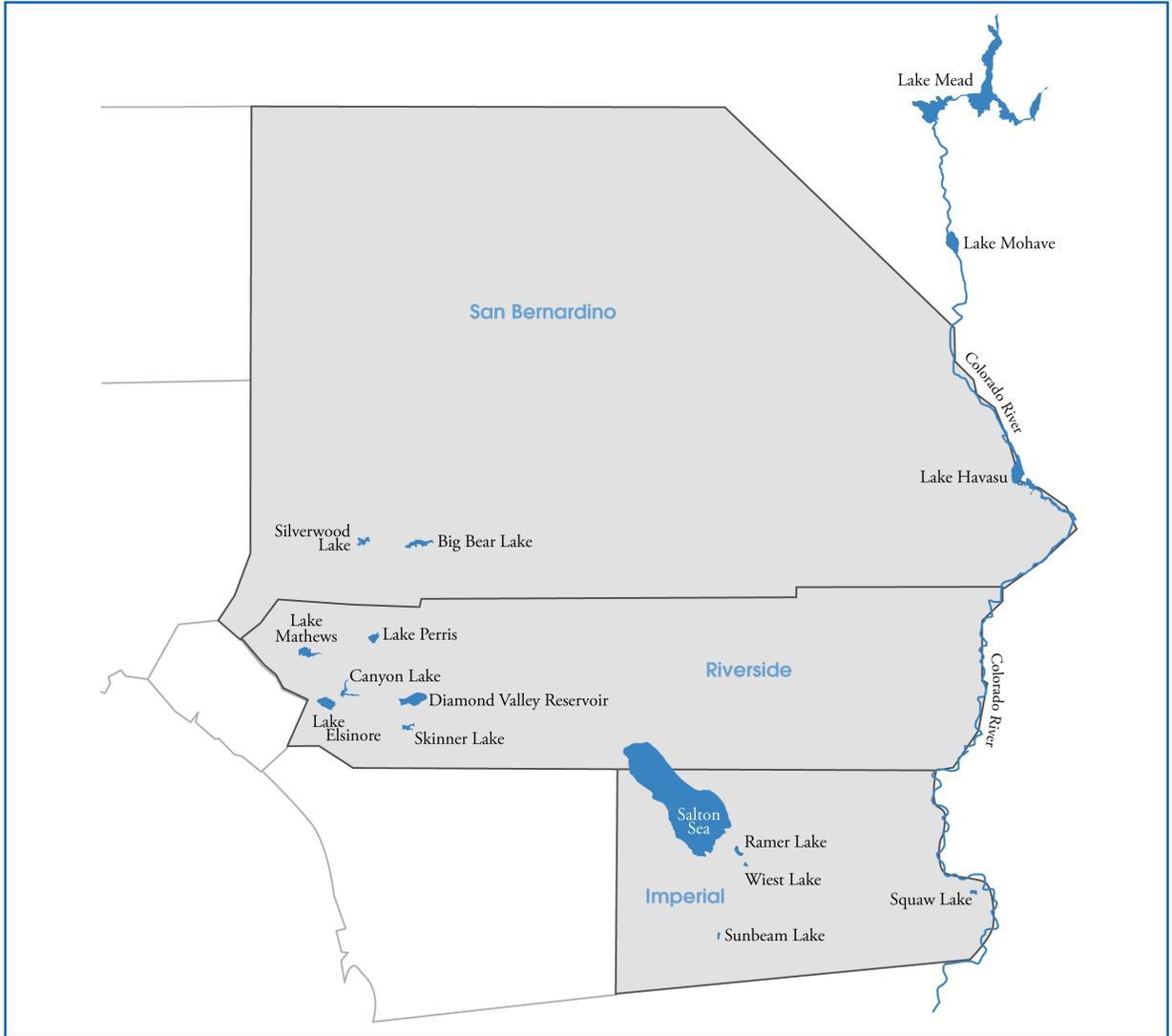
Colorado River runs along the eastern boundary of this region. The lakes of the region are few and small. **Exhibit 3.10**, on the next page, illustrates the major waterways in the Southern Interior region.

There are three key concerns in the Southern Interior region: (1) interactions with motorized boaters on the region's few lakes, (2) limited

non-motorized boating access imposed by water districts, and (3) high launch fees at many lakes.

**Table 3.21**, above, identifies waterways and facility needs in the Southern Interior region. **Table 3.22**, on the next page, identifies avoided waterways in the region.

**Exhibit 3.10**  
**Southern Interior Region Waterway Map**



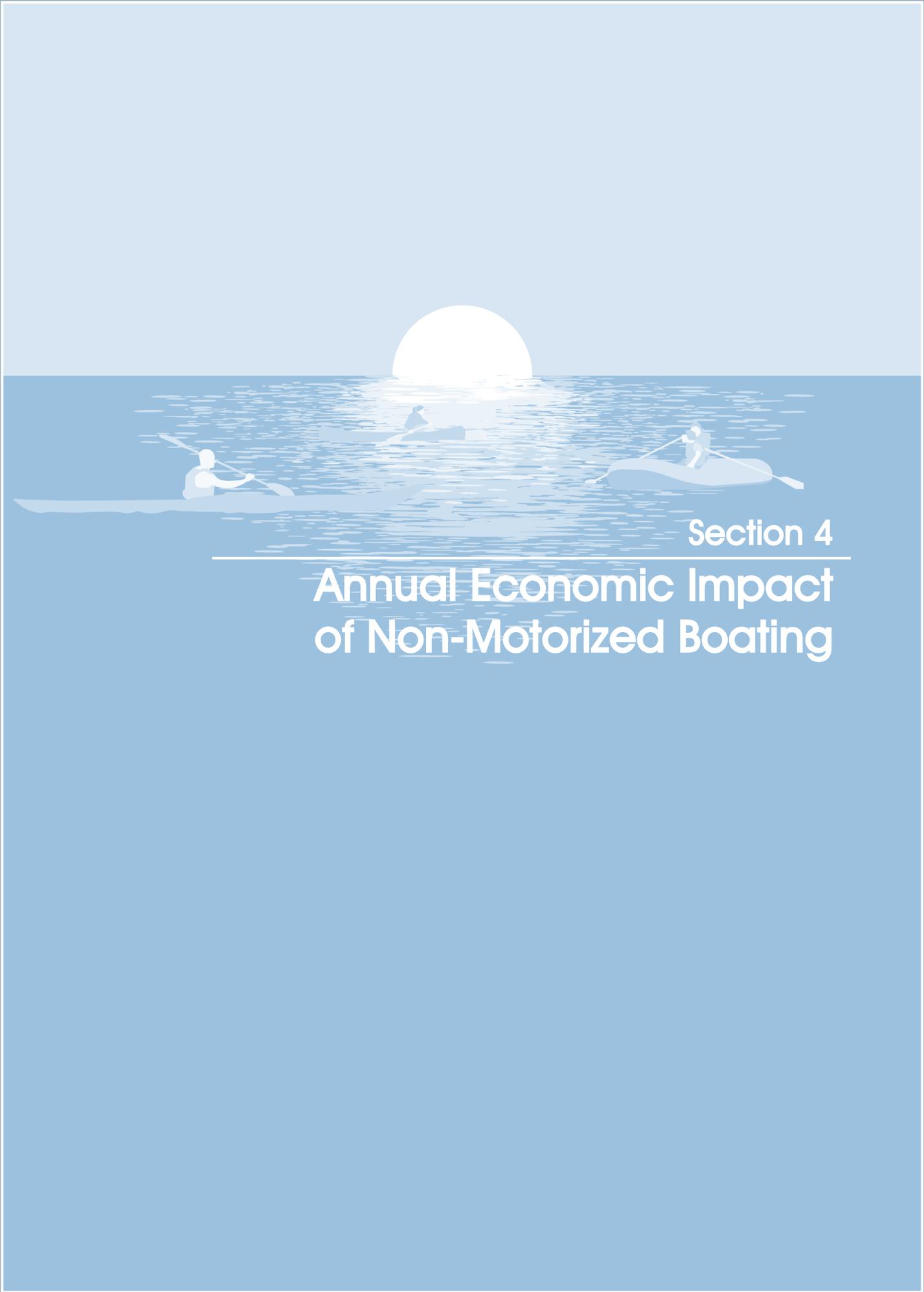
**Table 3.22**  
**Southern Interior Region Avoided Waterways and Reasons Identified by Non-Motorized Boaters (2006)**

Avoided Waterway	Lack of access	Overcrowding	Inadequate restrooms	Reckless boaters	Water conditions	Launch Fees
1. Colorado River	✓	✓		✓		
2. Diamond Valley Reservoir	✓		✓	✓		✓
3. Lake Perris		✓		✓		
4. Skinner Lake	✓					
5. Salton Sea					✓	
6. Silverwood Lake		✓				
7. Lake Elsinore		✓		✓	✓	
8. Lake Havasu		✓		✓		

*Note: A number indicates the priority ranking of the facility need or problem when enough data were available to rank. A check indicates that the facility need or problem was identified by survey respondents, interest group participants, or expert interviews.*

#### Section 3 Endnotes

- <sup>1</sup> Waterway managers interviewed for this project include: Gay Baxter, Klamath National Forest (Klamath, Salmon and Scott Rivers); Jeff Horn, Bureau of Land Management (South Fork American, North Fork American, Merced Rivers); Cheryl Bowen, Sequoia National Forest (Kern River); Lisa Emanuelson, Monterey National Marine Sanctuary (Monterey Bay); Noah Ruckert-Triplett, El Dorado County (South Fork American River); Kevin McKay, National Park Service, Point Reyes; Jim Micheals, California State Parks Folsom Unit (Folsom Lake, general information); Bill Deitchman, California State Parks Auburn Unit (Middle and North Fork of American River); Tom Jereb, PG&E Relicensing Project Manager (Feather River); John Swanson, Sierra National Forest (Tuolumne River); Matt Murphy, Corps of Engineers (Kaweah River); Terry Schumaker, Sierra National Forest (Kings River); and Jennifer Munn, Tulare County (Kaweah River).
- <sup>2</sup> Commercial and institutional organization respondents interviewed for this project include: William McGinnis, Whitewater Voyages; Steve Welch, ARTA River Trips; Joel Robinson, Forebay Aquatic Center; Rick Stock, Feather River Community College; Hunter Merritt, Peak Adventures; Bob Ferguson, Zephyr Whitewater; DeDe Birch, Jack London Aquatic Center; Tom Harris, Living Waters Recreation; Marna Powell, Kayak Zak's; Marc Rowley, Bigfoot Rafting; Greg Hawkins, Motherlode River Center; Dan Crandall, Current Adventures; and John McDermott, River Dancers.
- <sup>3</sup> Non-motorized boating club and organization representatives interviewed for this study include: Joe Roth, Southern California Windsailing Association; Robert Van Creuningen, San Diego Windsurfing Association; Paul Wilkins, Southwest Program Coordinator, U.S. Rowing; Marilyn Steele, Northern California Outrigger Canoe Association; Steve Lowry, El Toro International Yacht Racing Association; Howard Adamson, Southern California Outrigger Canoe Association; Tom Newton, International Naples Sabot Association; Steve Sherman, United States Optimist Dinghy Association; Susan Dennis, United States Optimist Dinghy Association; Dave Steindorf, American Whitewater; Paul Sanford, American Canoe Association; and Jess Perales, Kern River Alliance.
- <sup>4</sup> The draft report was circulated to approximately 350 individuals and organizations that participated in the various surveys, interviews, and interest group meetings. We incorporated comments related to waterways and facility needs from: Ann Buell, State Coastal Conservancy; Holly Harris and Chuck Lamb, [airkayaks.com](http://airkayaks.com); Todd Holmes, Sonoma County Regional Parks; Marty McDonnell, Sierra Mac River Trips; Chuck Seidler; Theresa Simsiman; and Michael Picker.
- <sup>5</sup> California Department of Boating and Waterways, Boating Trails Program (<http://dbw.ca.gov/boatrails.asp>).
- <sup>6</sup> American Canoe Association, "Water Trails" (American Canoe Association, <http://www.americancanoe.org>).
- <sup>7</sup> National Parks Service, Rivers, Trails and Conservation Assistance Program. *Logical Lasting Launches* (Washington D.C.: National Park Service, Spring 2004). Available at: [http://www.nps.gov/ncrc/programs/rtca/helpfultools/ht\\_launch\\_guide.html](http://www.nps.gov/ncrc/programs/rtca/helpfultools/ht_launch_guide.html).
- <sup>8</sup> National Water Safety Congress. *A Guide For Multiple Use Waterway Management, Second Edition* (Mentor, Ohio: National Water Safety Congress, 2004). Two additional water management resources are: United States Department of the Interior, Bureau of Reclamation. *Water Recreation Opportunity Spectrum User's Guidebook* (Lakewood, Colorado: Department of the Interior, July 2004); and Whittaker, Doug, Bo Shelby, and John Gangemi. *Flows and Recreation A Guide to Studies for River Professionals* (Washington DC: Hydropower Reform Coalition and the National Park Service, October 2005).
- <sup>9</sup> Truckee River Whitewater Park at Wingfield. [http://www.cityofreno.com/res/com\\_service/whitewaterpark](http://www.cityofreno.com/res/com_service/whitewaterpark).
- <sup>10</sup> Mc Hugh, Paul. "New whitewater park in Reno." (San Francisco: San Francisco Chronicle, May 20, 2004).
- <sup>11</sup> Ibid.
- <sup>12</sup> Truckee River Recreation Plan. "Economic Impact of Recreation Use Expenditures." (Available at: <http://www.wwparks.com>).
- <sup>13</sup> Friends of the River and the California Hydropower Reform Coalition. "Rivers of Power, A Citizen's Guide to River Restoration Through Hydropower Reform." (Sacramento, California: Friends of the River).
- <sup>14</sup> Ibid.
- <sup>15</sup> Recent studies conducted for FERC relicensing projects include: SMUD's Camino Reach Whitewater Boating Flow Study Technical Report (March 2005); SMUD's Whitewater Boating Flow Study for Slab Creek Reach Technical Report (October 2004); SMUD's Whitewater Boating Feasibility Technical Report (September 2004); and PG&E's Poe Hydroelectric Project Application for New License, Recreational Resources section (December 2003).
- <sup>16</sup> Personal communication with Sara Polger, San Francisco Bay Conservation and Development Commission, and; San Francisco Bay Conservation and Development Commission. *DRAFT San Francisco Bay Area Water Trail Plan* (San Francisco, California: BCDC, July 6, 2007).
- <sup>17</sup> Ibid., p.11.
- <sup>18</sup> Ibid., p.62.
- <sup>19</sup> Ibid., p.45.
- <sup>20</sup> City of San Diego Water Department. <http://www.sandiego.gov/water/recreation/index.shtml>.
- <sup>21</sup> See, <http://www.konoctitrails.com>.



Section 4

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# Annual Economic Impact of Non-Motorized Boating

## 4. Annual Economic Impact of Non-Motorized Boating

This section of the report summarizes the economic impact of non-motorized boating in California.

This section is organized as follows:

- A. *Economic Impact Analyses*
- B. *Methodology for Determining the Economic Contribution of Non-Motorized Boating in California*
- C. *Results of Economic Impact Analysis for Non-Motorized Boating in California.*

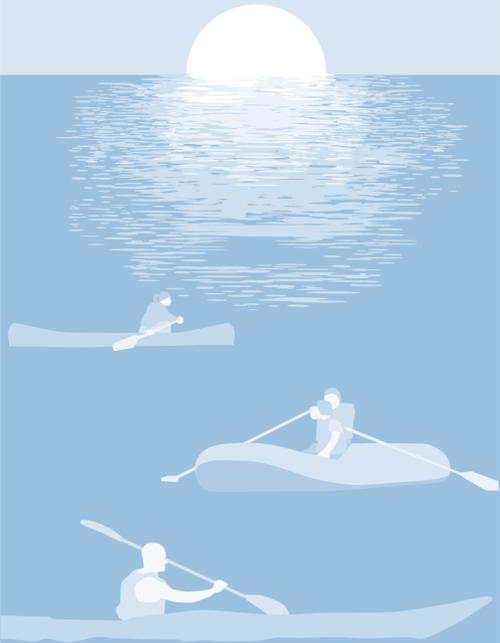
### A. Economic Impact Analyses

Economic impact analyses measure the change in overall economic activity (growth or contraction) brought to a nation, state, or region due to a particular event or activity. One type of economic impact study measures the change in economic activity resulting from a specific action – for example building a new golf course or whitewater rafting on a particular river. These studies look only at new economic activity in the region resulting from that activity. A second type of economic impact study determines the total economic contribution, or economic significance, of a particular activity – in this case non-motorized boating. The analyses described in this section are of the second type of economic impact – the total contribution to the economy from non-motorized boating in California.

This study examined the total contribution of non-motorized boating to the State economy, that is, the economic contribution or economic significance of non-motorized boating in California. The study estimated the extent of this economic contribution in the State and answered the following questions. Does non-motorized boating result in a significant contribution to California’s economy? Does non-motorized boating create jobs in the State? How much state and local tax revenues can be attributed to non-motorized boating?

Economic impact and economic contribution studies are quite different from economic benefit studies, which determine the recreational user value of an activity (Section 5). This economic contribution study was not concerned with the intangible value of benefits to boaters, but with the economic contributions resulting from boaters’ actual expenditures. Economic impact and economic contribution studies measure the impacts of actual transactions in the economy.

This economic impact study utilized the industry standard economic impact analysis software, IMPLAN (“impact planning”) to measure the economic contribution of non-motorized boating in California.<sup>1</sup> Input-output economic models use national and



regional economic data to measure this “ripple effect” of economic activity.

The total output or economic impact consists of three different types of effects:

1. Direct effects – immediate spending on purchases for final use. For example, purchases of boats, equipment, and trip expenditures such as food, gas, rentals, guides, etc.
2. Indirect effects – spending by industries that result from the direct expenditures. For example, changes in sales, in sectors within the region that supply goods and services related to non-motorized boating.
3. Induced effects – expenditures by employees in directly and indirectly impacted businesses for housing, utilities, groceries, etc.

The total economic significance, or output, of an activity such as non-motorized boating is the sum of the direct, indirect, and induced effects. That is, the total economic contribution is equal to: (Direct expenditures) + (Indirect expenditures) + (Induced expenditures).

### B. Methodology for Determining the Economic Contribution of Non-Motorized Boating in California

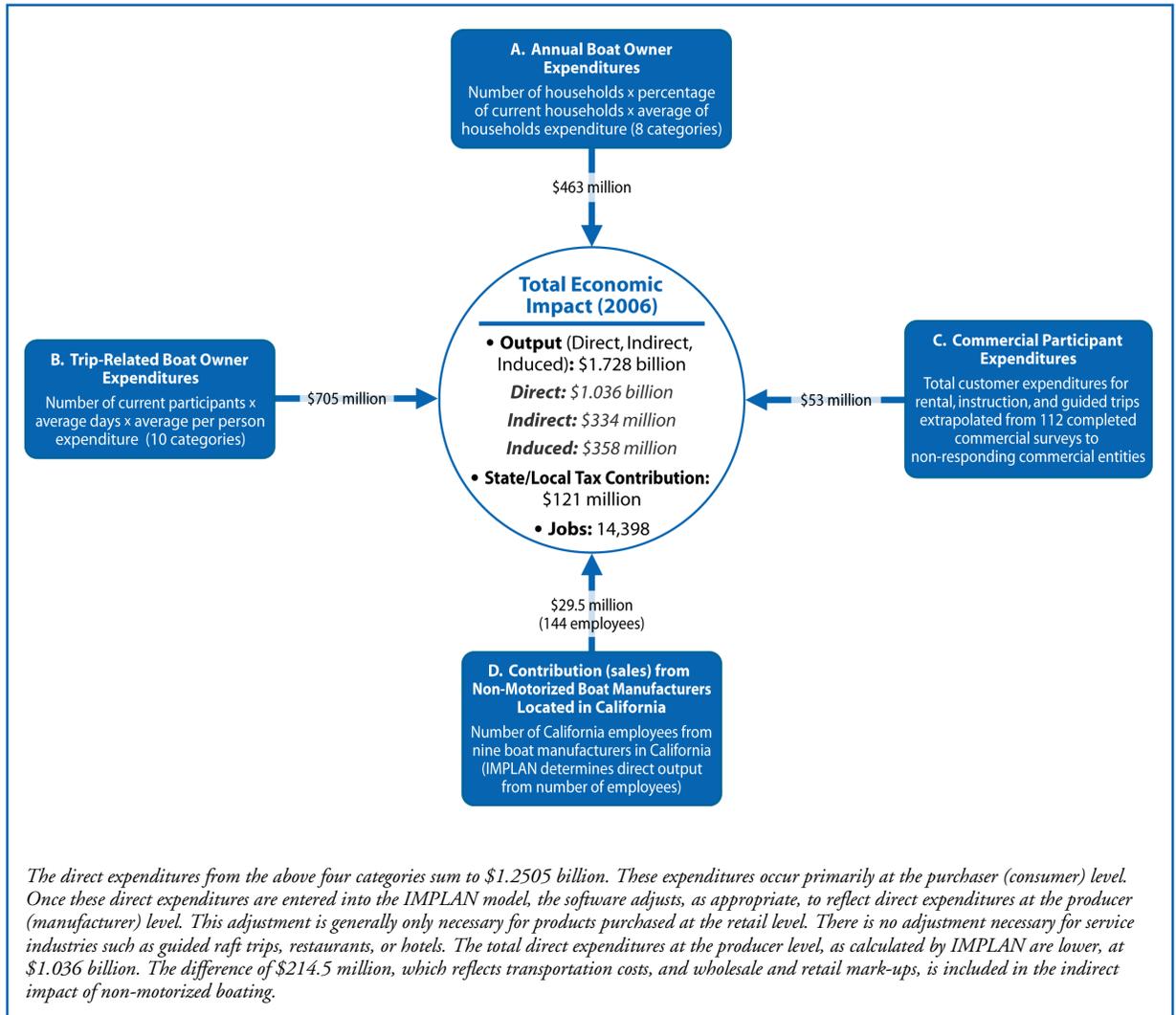
This analysis of the economic contribution of non-motorized boating utilized the MIG IMPLAN Professional Software, Version 2.0, combined with State of California 2004 data.<sup>2</sup> These were the most up-to-date economic modeling resources available at the time of this study. The final economic impact estimates were adjusted to 2006 year dollars, reflecting the year for which survey data were obtained.

The analyses included estimated non-motorized boating expenditures in four broad areas: (1) annual expenditures by non-motorized boat owners; (2) trip expenditures by non-motorized boat owners;

(3) consumer expenditures for non-motorized boat rentals, instruction, and guided trips; and (4) contributions from non-motorized boat manufacturers in California. **Exhibit 4-1**, on the next page, illustrates the four major categories of direct expenditures. These four expenditure areas can be further defined into six different sets of economic data, including expenditures and participation figures:

1. Number of non-motorized boat owning households. These data on total number of non-motorized boat owning households statewide, and in each of the ten DBW regions, were based on the statewide and regional random telephone survey results.
2. Average annual household expenditures of non-motorized boat owning households. These data were generated from results of the statewide random telephone survey for eight different expenditure categories.
3. Number of participant days for non-motorized boating trips, among non-motorized boat owning households. This figure was based on the statewide and regional random telephone surveys, using the average number of days of non-motorized boating per current participant.
4. Average per day non-motorized boat owner trip expenditures. These data were from the statewide random telephone survey for trip expenditures, adjusted to a per-person and per-day basis, for ten different expenditure categories.
5. Participation and expenditures for non-motorized boat rentals, instruction, and guided trips. These data were based on results of the commercial survey of 112 non-motorized boating commercial and institutional entities, and extrapolated by region to an estimated population of about 243 such entities.
6. Estimated gross sales output from nine non-motorized boat manufacturers located in California. The economic contribution of these businesses was based on the number of California employees at each business. The IMPLAN software calculated the value of sales based on average sales per employee ratios for the boat building industry.

**Exhibit 4.1**  
**Economic Impact Methodology Flow Chart for Non-Motorized Boating in California (2006)**



In general, there are limitations to economic impact studies. The results of this study utilized average (mean) participation and expenditure figures from the statewide random telephone survey. This methodology was consistent with other similar economic impact analyses.

It is important to note that mean participation and spending figures were highly variable, and reflected a wide range of responses, thus using the mean (rather than a median) could have overstated results. At the same time, there were several other factors that made the results of this

current non-motorized boating study conservative. Given the nature of these types of economic impact studies – with single large dollar value results based on a number of smaller inputs – erring on the side of conservatism provided more realistic and supportable results.

Factors that led to a more conservative estimate of the impact of non-motorized boating included:

- This study did not obtain data on non-motorized boating trip expenditures from out-of-state participants that owned their own boats. California offers unique non-motorized

boating opportunities, particularly for whitewater rafting and kayaking, sea kayaking, windsurfing, and kiteboarding. For example, the active-user Internet survey included responses from boaters in Nevada, Colorado, New York, North Carolina, Texas, and New Zealand that traveled to California to boat. Travelers from out-of-state incur significant expenses for food, lodging, and travel.

- This study also did not include trip expenditures for club and commercial/institutional participants, nor did it include annual expenditures for club participants. The limited data available in these categories were not adequate to provide reasonable expenditure estimates that could be extrapolated to the entire California population of commercial and club participants. Total trip expenditures for these participants were lower than for boat owners.
- This study had lower trip expenditure data from the statewide random survey than found in other types of studies of non-motorized boating participants. This difference may have been due to the true random nature of the large-scale statewide telephone survey, as compared to many other recreation participation studies that were based on a panel of outdoor enthusiast respondents, and then extrapolated to the general public. Also, the results of the statewide and regional random telephone surveys indicated that a large share of non-motorized boating took place close to home, and thus respondents incurred relatively little trip-related expenditures.

### C. Results of Economic Impact Analysis for Non-Motorized Boating in California

The total economic contribution of non-motorized boating in California in 2006 was \$1.7 billion. **Table 4.1**, above, illustrates the direct, indirect, and induced components of the total output figure.

**Table 4.1**  
Total Economic Contribution (Output) of Non-Motorized Boating in California (2006)

Impact Category	Value
Direct	\$1,036,581,606
Indirect	334,126,729
Induced	357,618,180
<b>Total</b>	<b>\$1,728,326,515</b>

**Table 4.2**  
Employment Impact of Non-Motorized Boating in California (2006)

Impact Category	Number of Jobs
Direct	9,391
Indirect	2,212
Induced	2,795
<b>Total</b>	<b>14,398</b>

In 2006, California’s Gross State Product (GSP) was \$1,727,355,000,000.<sup>3</sup> Thus, non-motorized boating contributed 0.1 percent of California’s GSP.

There were approximately 1.7 million non-motorized boats in California in 2006. Thus, the annual economic impact of each individual non-motorized boat in California was just over \$1,000.

Non-motorized boating in California provided 14,398 jobs in 2006. **Table 4.2**, above, illustrates the direct, indirect, induced, and total number of jobs created by non-motorized boating in California.

Non-motorized boating activities generate state and local tax revenues, which represent benefits to the State of California and its residents in general. Using IMPLAN, the total state and local tax impact of non-motorized boating in California in 2006 was \$121 million. The largest share of contributions to the total tax revenues were from indirect business taxes (sales tax and property tax) and personal income tax.

**Table 4.3**  
**Comparison of Two Economic Impact Studies**  
**for Boating in California**

Category	Non-Motorized Boating, California, 2006	Boating Needs Assessment 2000, All Boating <sup>a</sup>
Direct Impact	\$1,036,581,606	\$10,200,000,000
<b>Total Economic Output</b>	<b>\$1,728,326,515</b>	<b>\$16,500,000,000</b>
Average "Multiplier"	1.67	1.62
<b>Total State/Local Taxes</b>	<b>\$120,900,000</b>	<b>\$1,418,000,000</b>
Direct Jobs	9,391	181,500
<b>Total Jobs</b>	<b>14,398</b>	<b>284,000</b>

<sup>a</sup> This analysis includes all motorized boating-related activities, including commercial fishing, and sailboats over eight feet in length.

**Table 4.3**, above, provides a comparison of the total output, employment, and state and local tax impacts of non-motorized boating from this study, to the economic impacts of all (motorized boats and sailboats over eight feet) boating from the 2002, *California Boating Facilities Needs Assessment* (BNA).<sup>4</sup> While the results of the current study were almost ten times lower than the BNA study, the \$1.7 billion impact of non-motorized boating appeared reasonable for non-motorized boating activities.

The BNA estimate for California total boating economic output in 2000 was \$16.5 billion, almost ten times greater than the 2006 figure for just non-motorized boating. This large difference was due, in part, to the fact that the BNA figure reflects a significantly broader range of economic activity, including commercial fishing, fish wholesalers, and all manufacturing, distribution, and sales activity related to motorized boats.

The economic impact of non-motorized boating estimate of \$1.7 billion also included manufacturing, distribution, and sales activity specific to non-motorized boats. However, there were very few non-motorized boat manufacturers located in California, and non-motorized boats are significantly less costly than motorized boats. In addition, one of the major attractions of non-motorized boating is that it is a relatively low cost activity. For most participants, a typical non-motorized boating trip involved a short drive to a nearby waterway, and perhaps a picnic lunch. Thus, per-trip expenditures for non-motorized boaters in this study were less than per-trip expenditures for motorized boaters in the BNA.

**Table 4.4**, on the next page, summarizes direct, indirect, induced, and total economic output by region.<sup>a</sup> **Table 4.5**, following Table 4.4, provides a comparison of the economic output per boat in each of the ten regions.

**Table 4.6**, on the next page, summarizes the total number of jobs (direct, indirect, and induced) resulting from non-motorized boating in each region. The three regions with the greatest number of jobs were the South Coast, Sacramento Basin, and Central Valley. The high number of non-motorized boating jobs in the South Coast region primarily reflected the large population in that region.

**Table 4.7**, on the next page, provides a comparison of state and local tax revenues that resulted from non-motorized boating in each region. The South Coast, Sacramento Basin, San Francisco Bay Area, and Central Valley regions contributed the majority of state and local tax revenues resulting from non-motorized boating.

<sup>a</sup> Because the statewide random survey may not have captured instances in which boaters residing in one region spent funds in another region, these data have lower accuracy than the statewide figures.

## 4. Annual Economic Impact of Non-Motorized Boating

**Table 4.4**  
Total Economic Contribution (Output) of Non-Motorized Boating by Region in California\* (2006)

Region	Direct	Indirect	Induced	Total Output	Percent of NMB Output
1. North Coast	\$64,041,891	\$18,109,472	\$20,415,829	\$102,567,192	5.9%
2. San Francisco Bay Area	158,866,834	47,393,152	50,311,438	256,571,424	14.8%
3. Central Coast	54,141,437	14,973,504	15,373,199	84,488,140	4.9%
4. South Coast	260,463,512	94,986,353	108,257,719	463,707,584	26.9%
5. San Diego	118,063,031	36,992,679	37,635,889	192,691,599	11.1%
6. Northern Interior	11,378,947	2,056,936	2,218,253	15,654,136	0.9%
7. Sacramento Basin	201,221,111	62,214,521	68,233,659	331,669,291	19.2%
8. Central Valley	141,442,884	50,463,560	47,370,763	239,277,207	13.9%
9. Eastern Sierra	3,020,764	559,451	491,889	4,072,104	0.2%
10. Southern Interior	23,941,195	6,377,101	7,309,542	37,627,838	2.2%
<b>Total</b>	<b>\$1,036,581,606</b>	<b>\$334,126,729</b>	<b>\$357,618,180</b>	<b>\$1,728,326,515</b>	<b>100.0%</b>

**Table 4.5**  
Total Economic Contribution (Output) per Non-Motorized Boat by Region in California\* (2006)

Region	Total Output	Boats by Region	Economic Output per Boat
1. North Coast	\$102,567,192	105,349	\$974
2. San Francisco Bay Area	256,571,424	297,465	\$863
3. Central Coast	84,488,140	98,903	\$854
4. South Coast	463,707,584	398,837	\$1,163
5. San Diego	192,691,599	154,119	\$1,250
6. Northern Interior	15,654,136	17,608	\$889
7. Sacramento Basin	331,669,291	365,619	\$907
8. Central Valley	239,277,207	175,805	\$1,361
9. Eastern Sierra	4,072,104	6,252	\$651
10. Southern Interior	37,627,838	77,030	\$488
<b>Total</b>	<b>\$1,728,326,515</b>	<b>1,696,987</b>	<b>\$1,018</b>

**Table 4.6**  
Employment Impact of Non-Motorized Boating by Region in California\* (2006)

Region	Employment	Percent of NMB Jobs
1. North Coast	932	6.5%
2. San Francisco Bay Area	1,861	12.9%
3. Central Coast	713	4.9%
4. South Coast	3,574	24.8%
5. San Diego	1,536	10.7%
6. Northern Interior	184	1.3%
7. Sacramento Basin	3,042	21.1%
8. Central Valley	2,192	15.2%
9. Eastern Sierra	40	0.3%
10. Southern Interior	324	2.3%
<b>Total</b>	<b>14,398</b>	<b>100.0%</b>

**Table 4.7**  
State and Local Tax Impact of Non-Motorized Boating by Region in California\* (2006)

Region	State and Local Taxes
1. North Coast	\$7,406,816
2. San Francisco Bay Area	17,543,443
3. Central Coast	5,937,358
4. South Coast	31,776,621
5. San Diego	12,445,035
6. Northern Interior	1,218,744
7. Sacramento Basin	24,458,161
8. Central Valley	17,256,822
9. Eastern Sierra	289,882
10. Southern Interior	2,601,369
<b>Total</b>	<b>\$120,934,251</b>

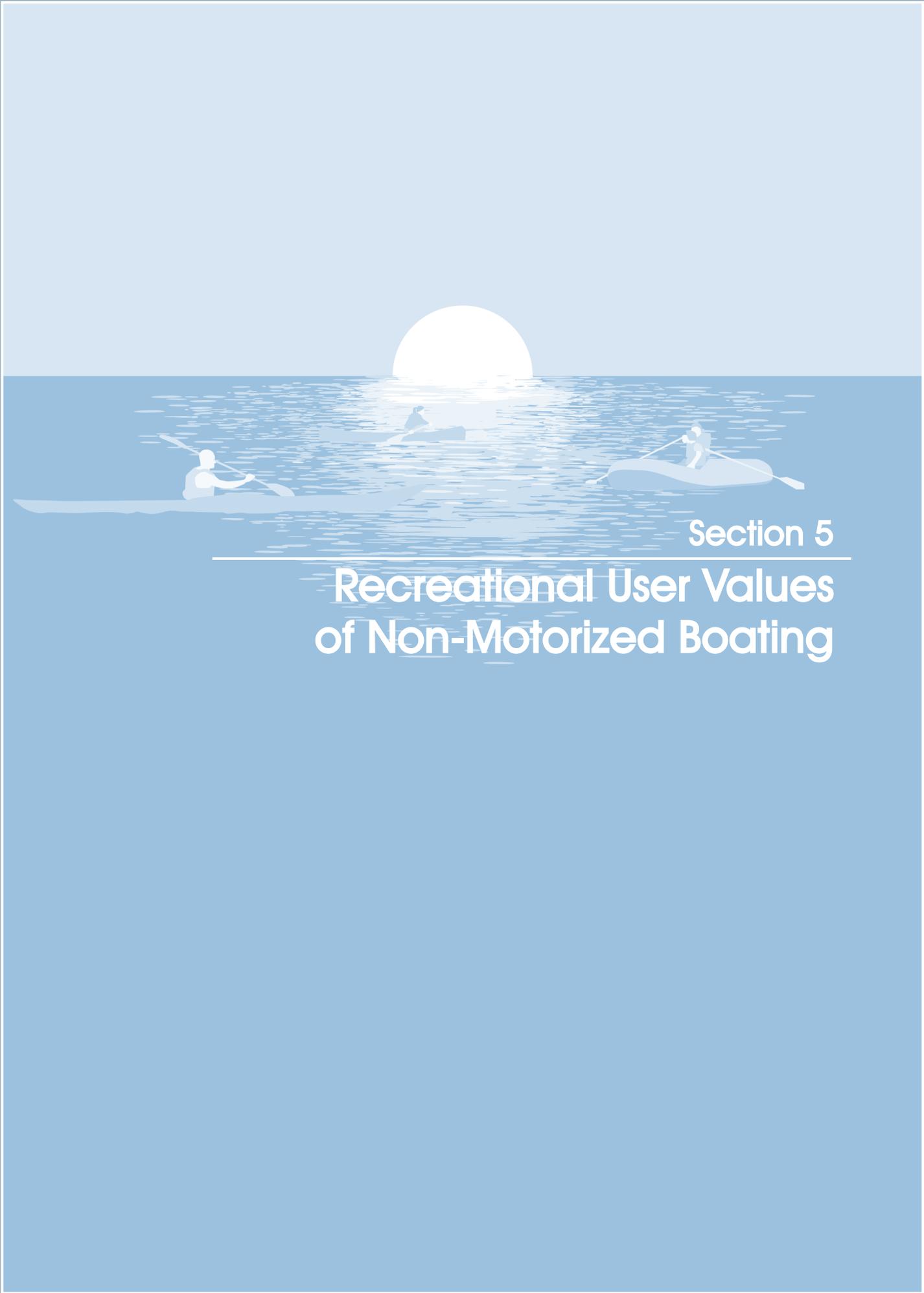
\*IMPLAN analyses were conducted for each of the ten regions, based on region-specific participation and expenditures. The regional results were then proportionally adjusted to match the total statewide output, jobs, and tax revenues.

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## Section 4 Endnotes

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- <sup>1</sup> Minnesota IMPLAN Group, Inc. *IMPLAN Pro User's Guide, Analysis Guide, Data Guide* (Stillwater, Minnesota: MIG, February 2004).
- <sup>2</sup> Minnesota IMPLAN Group, Inc. (MIG). *IMPLAN Professional, Version 2.0*.
- <sup>3</sup> Bureau of Economic Analysis. "Regional Economic Account." (<http://www.bea.gov/regional/gsp/action.cfm>)
- <sup>4</sup> NewPoint Group, Sacramento State University Sacramento Foundation, Planning and Applied Economics, Bay Area Economics, Public Research Institute. *California Boating Facilities Needs Assessment, Volume V Boating Economic Assessment and Demand Projections* (Sacramento, California: Department of Boating and Waterways, October 15, 2002).



Section 5

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# Recreational User Values of Non-Motorized Boating

# 5. Recreational User Values of Non-Motorized Boating

This section of the report examines the recreational user values of non-motorized boating. Recreational user values represent the non-market, or intangible, value of an activity. This background discussion of non-market goods and methods for determining recreational user values is based on Volume V, of the *California Boating Facilities Needs Assessment (BNA), Boating Economic Assessment and Demand Projections*.<sup>1</sup>

This section is organized as follows:

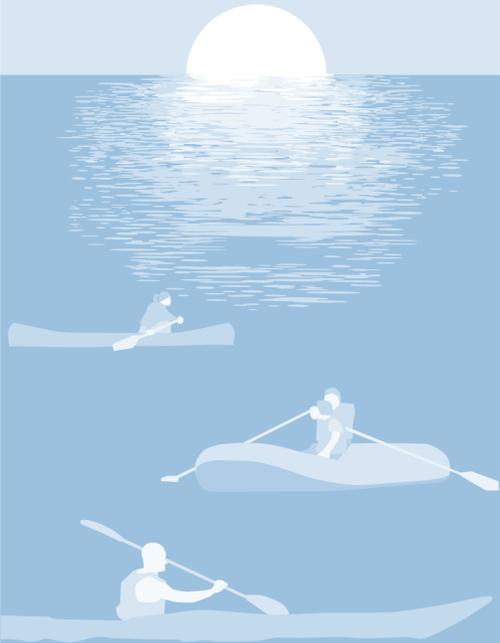
- A. *Economic Concepts: Non-market Goods, Supply, Demand, and Consumer Surplus*
- B. *Travel Cost Method*
- C. *Benefit Transfer Method*
- D. *Summary of Recreational User Values of Non-Motorized Boating in California.*

## A. Economic Concepts: Non-market Goods, Supply, Demand, and Consumer Surplus

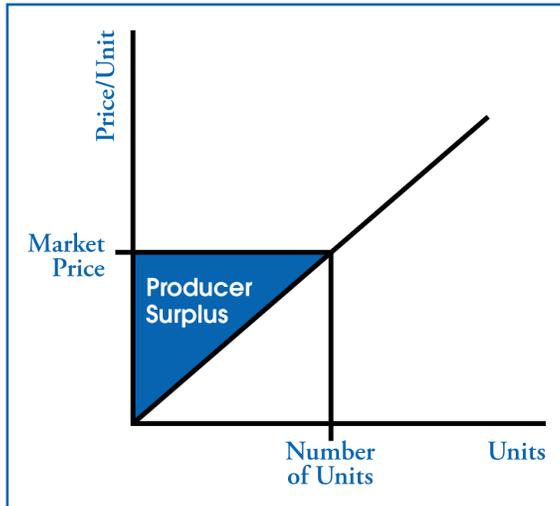
In order to determine the recreational value of non-motorized boating in California, it was useful to define concepts of non-market goods, supply, demand, consumer surplus, and other principles of economic theory. Attempting to assign a monetary value to recreational non-motorized boating presents several challenges.

One significant obstacle is that different types of value associated with recreation (e.g., health benefits of physical exercise, enjoyment of scenic beauty, rewards from perfecting a skill, etc.) are measured using different methodologies and are expressed in different units. Employing dollars as a standard unit of recreational value requires some subjective judgment and is frequently difficult to defend. In addition, at least one school of thought proposes that recreation is, by definition, a non-market good with intangible values, and therefore it is not justifiable to attempt to attach a monetary value to it.

On the other hand, economists frequently arrive at a meaningful estimate for the value of many non-market resources through the concept of consumer surplus. The conceptual basis for providing an understanding of consumer surplus is the simple supply and demand models shown in **Exhibit 5.1** and **Exhibit 5.2**, both on the next page. The supply curve indicates the quantity of a good or service supplied at varying prices, and it shows the marginal cost of producing more of the good or service. Generally, the higher the price, the more a good or service will be supplied by the market. Because producers wish to sell more of a good or service at higher prices, the supply curve slopes upward.

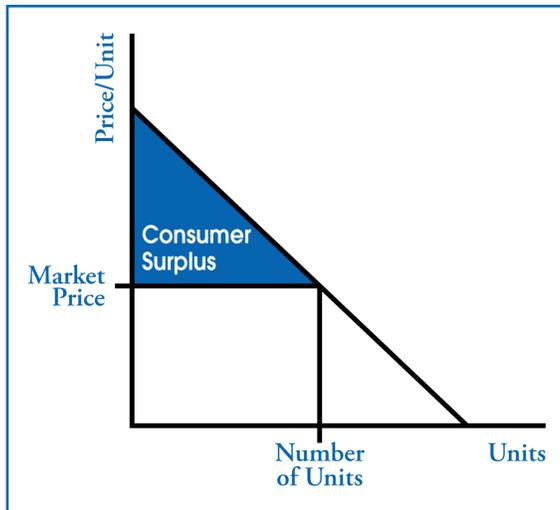


**Exhibit 5.1**  
The Supply Curve and Producer Surplus



If producers receive a higher price for a good or service than the minimum price for which they would have been willing to sell it, then they receive a benefit from the sale, i.e., the producer surplus (see shaded area in Exhibit 5.1). Likewise, consumer surplus is the difference between the maximum price consumers would be willing to pay for a good or service, and what consumers actually spend (see shaded area in Exhibit 5.2).

**Exhibit 5.2**  
The Demand Curve and Consumer Surplus



For a non-market good, such as non-motorized boating recreation, the concept of a demand curve exists as if it were a market good. Since the demand curve for a non-market good cannot be represented by market transactions, it must be derived from stated or revealed preferences. Economists have developed three main techniques to estimate demand for recreation: the travel cost method (a revealed preference approach), the contingent valuation method (a stated preference approach), and the benefit transfer method (drawing on existing studies). The estimation of the recreational user value of non-motorized boating described in this section utilizes both the travel cost method and the benefit transfer method.

## B. Travel Cost Method (Revealed Preference Approach)

The demand curve indicates the maximum amount that consumers are willing to pay for incremental increases in the quantity of a good or service. As the price of a good or service increases, the level of consumer demand decreases because consumers only purchase a good or service when the value they receive is greater than the price they pay. This is known as the law of demand and it is reflected in a downward sloping demand curve.

The underlying principle of the travel cost (TC) method is that time and travel costs that consumers incur to enjoy a recreational outing can be used as a proxy to estimate the “price” of recreation. These costs reflect only the recreational value of the outing. Other costs such as equipment expenses, user fees, etc., are specifically excluded from the TC method. The TC method assumes that the consumer’s willingness to pay time and travel expenses for a recreational outing can be estimated based on the number of trips that they make at different travel costs. This is comparable to estimating consumer demand for market goods based on the quantity demanded by consumers at different prices.

Application of the travel cost method requires administering a detailed survey to visitors, and conducting a statistical analysis of the survey results. Such a survey asks a variety of questions about each visitor’s travel experience including the distance traveled to the site, the length of the trip, amount of travel expenses, the number of trips to the site per year, and income data (to determine the opportunity cost of travel time). Analysts may use a regression analysis of such survey data to estimate the relationship between the number of visits and travel costs, and provide a demand function for the typical visitor.

We used an alternative method of estimating boaters’ travel cost value for recreational boating. This method estimated travel costs using average (mean) responses from the statewide random telephone survey of non-motorized boaters. These results were based on 157 random surveys.<sup>a</sup>

We provided three different approaches to estimating recreational user values per person, per day, for non-motorized boating in California: (1) average travel time, (2) average travel cost, and (3) average actual trip expenditures. The resulting three estimates of recreational user value per person, per day, of non-motorized boating are provided in **Table 5.1**, above.

The highest estimate of recreational user value resulted from the average travel time approach. The average travel time approach estimate was \$50.01 per person, per day, for non-motorized boating. This value was based on the average travel time per trip (in hours) and the average hourly wage of survey respondents (in dollars).

<sup>a</sup> A total of 288 of the 351 statewide random survey respondents participated in non-motorized boating in the last five years. These 288 respondents answered survey questions related to their most recent non-motorized boating trip. However, the methodology we used for calculating travel costs assumed that the sole purpose of the trip was for non-motorized boating. Thus, the number of useable surveys was reduced from 288 respondents to 157 respondents.

**Table 5.1**  
**Estimated Recreational User Value of Non-Motorized Boating Per Person, Per Day, in California (2006)**

Estimation Approach	Recreational User Value, Per Person, Per Day
1. Average Travel Time	\$50.01
2. Average Travel Cost	\$36.09
3. Average Actual Trip Expenditures	\$13.02

The mid-range estimate of recreational user value resulted from the average travel cost approach. The average travel cost approach estimate was \$36.09 per person, per day, for non-motorized boating. This value was based on the average miles per trip, and the American Automobile Association (AAA) estimate for costs of operating an automobile at 52.2 cents per mile.<sup>2</sup>

The lowest estimate of recreational user value resulted from the average actual trip expenditures approach. The average actual trip expenditures approach estimate was \$13.02 per person, per day, for non-motorized boating. This value was based on average per person daily expenditures for fuel, parking, entrance fees, and lodging.

### C. Benefit Transfer Method

To provide a crosscheck to the recreational user value measures derived from our survey results, we researched other methods to calculate the recreational value of non-motorized boating. The U.S. Forest Service has an interest in estimating the value of outdoor recreation activities for areas under its jurisdiction. As a result, the U.S. Forest Service has conducted numerous recreational user value studies. In 2005, the U.S. Forest Service published *Updated Outdoor Recreation Use Values on National Forests and Other Public Lands (Update)*,<sup>3</sup> an update of a 2001 report, *Benefit Transfer of Outdoor Recreation Use Values*.<sup>4</sup>

Benefit transfer refers to the use and adaptation of existing economic data derived from specific sites to other sites with similar conditions. Benefit transfer analysis utilizes information from a large number of studies and provides reliable measures of average values that are sensitive to underlying distributions of the data. The benefit transfer model developed in 2001, and then updated in 2005, was tested for convergent validity and it performed well in providing accurate average values for each activity in all regions where data existed.

The 2005 *Update*, fifth in a series of similar reports, was prepared for the U.S. Forest Service to provide recreation value data in cases where primary research is not justified because of budget constraints, limited time for research, or where resource impacts are expected to be insignificant. The *Update* provides an average recreational user value (consumer surplus or willingness to pay) per day, for thirty (30) different recreational activities. The resulting database provides 1,239 separate estimates of per person, per day, recreational user values, summarizing over thirty (30) years of literature.

The *Update* included twenty (20) studies and eighty (80) separate estimates of recreational user value per person, per day, for the category, “floatboating/rafting/canoeing”. This category most closely reflects our study definition of non-motorized. The mean recreational user value per person per day for all eighty (80) floatboating/rafting/canoeing estimates was \$100.91. Only one study, and four (4) estimates of recreational user value were specifically for non-motorized boating in California (on the Trinity River). The mean recreational user value per person, per day, for the four (4) Trinity River estimates was \$27.84.

### D. Summary of Recreational User Values of Non-Motorized Boating in California

Using the travel cost and benefit transfer approaches, we obtained five separate estimates of the recreational user value of non-motorized boating in California, per person, per day. These values ranged from a low of \$13.02 per person, per day, to a high of \$100.91 per person, per day.

The mid-range estimate was a recreational value of \$36.09 per person, per day, for non-motorized boating. This estimate was based on the average miles per non-motorized boating trip, and the AAA costs per mile of operating an automobile.

The non-motorized boating recreational user value estimates from this study are slightly higher than the motorized boating recreational user value estimates from the BNA. In 2000, the BNA study of motorized boating (including sailboats eight (8) feet and longer in length) identified recreational user values for motorized boating of between \$4.14 and \$29.36 per person, per day. The mid-range recreational user value for motorized boats in the BNA was \$17.89 per person, per day (in year 2000 dollars).

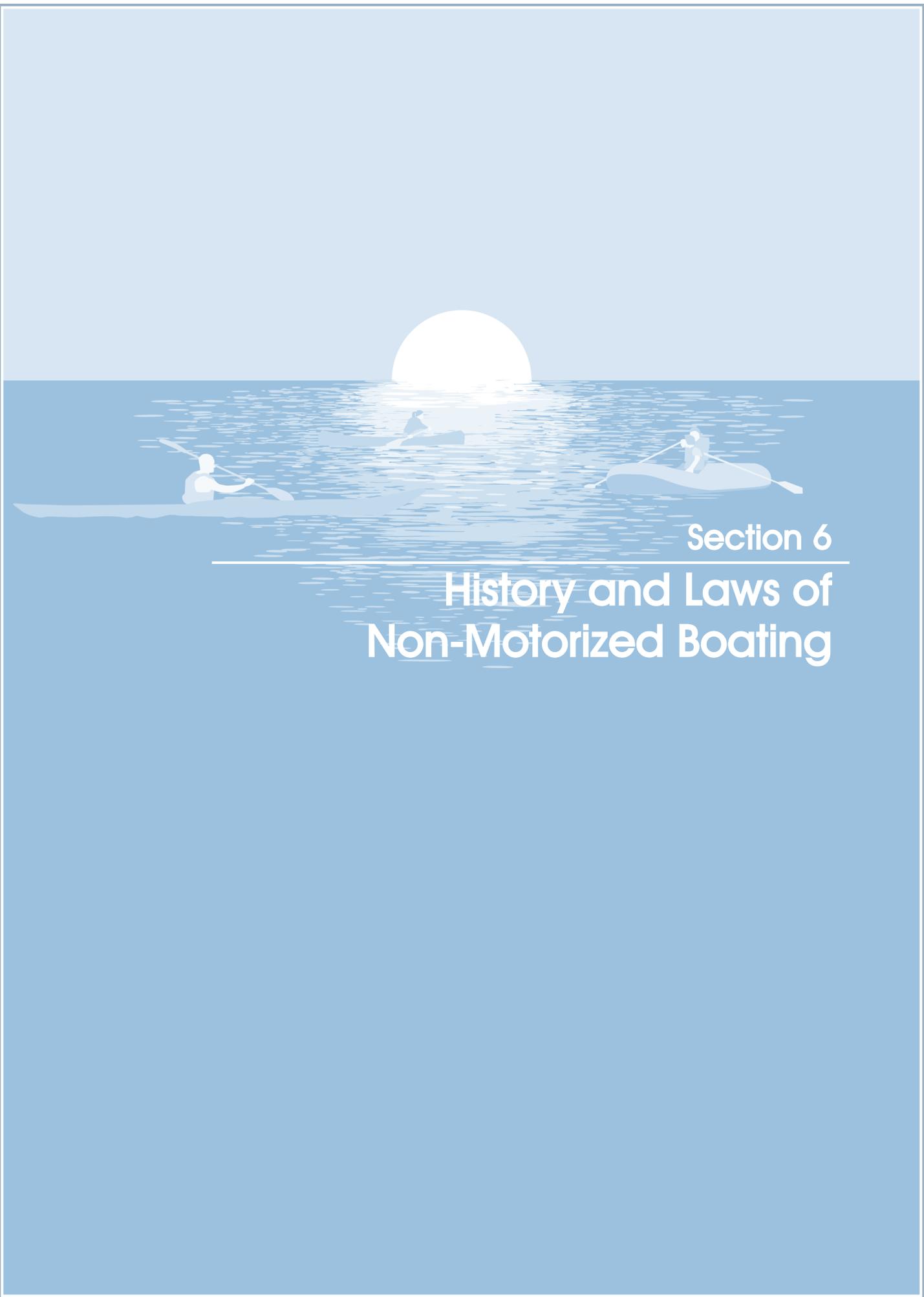
A higher recreational user value for non-motorized boating, as compared to *motorized* boating, is consistent with U.S. Forest Service studies. The average recreational user value for motorized boating in the *Update* was \$46.27 per person, per day, compared to \$100.91 per person, per day, for float boating/rafting/canoeing.<sup>5</sup>

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## Section 5 Endnotes

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- <sup>1</sup> NewPoint Group, Sacramento State University Sacramento Foundation, Planning and Applied Economics, Bay Area Economics, Public Research Institute. *California Boating Facilities Needs Assessment, Volume V, Boating Economic Assessment and Demand Projections* (Sacramento, California: California Department of Boating and Waterways, October 15, 2002, Chapter 2).
- <sup>2</sup> American Automobile Association.  
(at <http://www.aaa.com>).
- <sup>3</sup> John Loomis. *Updated Outdoor Recreation Use Values on National Forests and Other Public Lands* (Portland, Oregon: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, October 2005).
- <sup>4</sup> Randall S. Rosenberger and John B. Loomis. *Benefit Transfer of Outdoor Recreation Use Values* (Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, 2001).
- <sup>5</sup> Loomis, 2005.



Section 6

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# History and Laws of Non-Motorized Boating

## 6. History and Laws of Non-Motorized Boating

This discussion of the history and laws of non-motorized boating is based on: (1) a literature review of non-motorized boating and outdoor recreation; (2) a high-level review of federal and state non-motorized boating laws and regulations; and (3) interviews with selected industry experts.

This section is organized as follows:

A. *History of Non-Motorized Boating*

B. *Law and Regulation Issues Related to Non-Motorized Boating.*

### A. History of Non-Motorized Boating

For the early years, we can discuss the history of non-motorized boating in the United States and California in parallel. This section examines the general history of outdoor recreation and the advent of non-motorized boating.

Outdoor recreation in this country is viewed to have begun in the mid 1800s, during the period known as the American transcendental movement, or Victorian Era.<sup>1</sup> Certainly, prior to this time there was significant use of non-motorized boats – going back thousands of years. Canoes and kayaks were used by Native Americans, and adopted by white settlers and explorers. The 3,700 mile canoe trip by Lewis and Clark, starting in 1803, is one of the most famous examples of early non-motorized boating. John Wesley Powell’s 1869 (and later) explorations of the Grand Canyon in wooden dories were also founded in exploration, not recreation.<sup>2</sup> It was following this exploratory period, in the mid- to late-1800s that non-motorized boats – canoes and dories, were first used for recreation.<sup>3</sup>

This shift from conquering or exploring nature to enjoying nature was part of a transition that started with individuals such as writers Ralph Waldo Emerson and Henry David Thoreau (*Walden*), and artist Thomas Cole, who painted large western sceneries as part of the Hudson River School.<sup>4</sup> This trend of romanticizing the natural world continued after the Civil War, and expanded to include conservation. Well known outdoorsmen of the time included: Mark Twain, author of *Roughing It* and *Adventures of Huckleberry Finn*; artist Thomas Moran, whose paintings glamorized Yellowstone and Yosemite; and John Muir, who explored, wrote, and worked to conserve California’s Sierra Nevada Mountains. Yellowstone National Park was created by Congress in 1872. Yosemite was granted to the State of California by the federal government in 1864, and then declared a National Park in 1890. Tourists traveled to enjoy these areas, typically by train, starting in the late 19<sup>th</sup> century.<sup>5</sup>



Non-motorized boating, as recreation, began in parallel with the general interest in outdoor recreation. Two early boaters included photographers Emery and Ellsworth Kolb, who retraced John Wesley Powell's trip down the Green and Colorado rivers in 1911.<sup>6</sup> Emery Kolb showed the movie of the trip at the South Rim of the Grand Canyon four times a day until his death at the age of 96. Alfred Wickett of New England is credited with being largely responsible for the first commercially produced canvas-covered canoe as the designer, chief builder, and operations manager for Old Town Canoe from 1900 to 1914.<sup>7</sup> One of the first publicly recognized non-motorized boaters was Wisconsin conservationist, canoeist, and writer Sigurd Olson, who paddled, publicized the joys of canoeing, and worked to conserve wilderness starting in the 1920s.<sup>8</sup>

*Paddler Magazine's* list of the top 100 "visionaries, innovators, Olympic athletes, or legendary explorers" in paddling over the 20<sup>th</sup> century provides a snapshot into the progression of non-motorized boating over the last 100 years. While non-motorized boating started with these early innovators of the 20<sup>th</sup> century, it appeared to remain a niche interest through much of the early 1900s. Following World War II, and into the 1960s, non-motorized boating continued to grow, although it was still considered a small scale sport.

It was the Baby Boomer generation that spearheaded a new interest in outdoor recreation and getting back to nature.<sup>9</sup> The growth in outdoor adventures, spurred as Baby Boomers became young adults in the 1960s and 1970s, was unprecedented. For the first time, land management agencies had to impose restrictions on recreational use, issuing permits for river-running and backpacking.<sup>10</sup>

Following the Baby Boomers, Generation X (born between 1961 and 1981) fueled a riskier approach to outdoor activities. While the Baby Boomers were seen as more idealist, "getting back

to nature", Generation X approached outdoor activity as more of a sport, often a risky sport. The growth in non-motorized boating continued as Generation X took and expanded these non-motorized boating activities, for example, fueling a growth in whitewater kayaking starting in the late 1990s.

Non-motorized boating in California was led by a core group of individual boaters, many of whom either developed new types of boats, or explored California's rivers and waterways for the first time. Much of this development and growth took place in the 1970s and 1980s, and is discussed for different boat types, below.

Much of the recent growth in non-motorized boating appears to be in recreational kayaking,<sup>11</sup> a start-up activity that makes non-motorized boating accessible to a growing number of individuals and families. On the other hand, participation in whitewater kayaking, at least at the national level, appears to be relatively flat.<sup>12</sup>

Another trend that some outdoor guide outfitters are seeing is the luxury outdoor trip. These outfitters are witnessing significant interest in "high-end" rafting trips – providing showers, quality food, wine, and "just a bit of whitewater". This type of trip could be popular with both the Baby Boomer generation, as they near retirement, and Generation X, as they have families and reduce their high-risk activities.

At the opposite end of the recreation spectrum, are those that no longer have time for outdoor activities. For this group, a full day on the water might be too much, and spending an hour or two on a guided trip, or boating on a nearby waterway, may become the extent of their outdoor boating activity.

Much of the growth of non-motorized boating has been linked to technological advancements in boat-building. Newer and better boats opened up rivers that were previously unnavigable, a trend

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that continues today. Each new non-motorized boat type offers benefits over previous versions, either in navigability, cost, or both.

The advent of the aluminum canoe, following World War II, introduced light, rugged, and affordable canoe boats. The latest generation of shorter and wider whitewater kayaks provide maneuverability that is far superior to early models. Similarly, plastic recreational kayaks today provide the same features to another generation of non-motorized boaters. Specific advances are discussed for the major categories of non-motorized boats, below.

## 1. Wooden Dories

Much of the early river running took place in wooden skiffs or dories. These boats, of various designs, were generally flat bottomed, 12 to 16 feet long, and 4 to 5 feet wide, with a flat bow and pointed stern. Nathaniel Galloway, a Utah trader, developed the “lightweight” Galloway, originally at 400 pounds, and later getting it down to 243 pounds.<sup>13</sup> A major innovation, credited to Galloway, was to run the river with the boater facing the rapids, rather than with the boater facing backwards. This allowed the boater to see the rocks and other hazards.<sup>14</sup>

What is believed to be the first recreational trip down the Colorado River took place in 1909, when a mining company executive, Julius Stone, hired Galloway to build four boats and guide a group from Green River, Wyoming, to Needles, California.<sup>15</sup> This appears to be the first recreational non-motorized boating trip in California, although most of the trip took place elsewhere. The trip took just over two months, from September to November. Several other Colorado River boat trips followed, including the Kolbs’ photographic expedition in 1911.<sup>16</sup>

Two other wooden boats, the McKenzie dory and cataract boat, were used in the early and mid-

1900s for river running, both in the Grand Canyon and other rivers such as the Rogue River in Oregon, and the Middle Fork of the Salmon River in Idaho.

The cataract boat was designed by Norm Nevills in 1938, and was used for the first commercial trips down the Colorado River.<sup>17</sup> Nevills Expeditions expanded and carried passengers down many Western rivers, including the San Juan, Green, Snake, Salmon, and Colorado until his death in 1949. Nevills was responsible for taking about one-third of the first 100 people through the Grand Canyon on the Colorado River (a figure reached in 1949).<sup>18</sup> His company was bought by two of his employees, and then later by his daughter and son-in-law, and continues to operate rafting trips today (although no longer in wooden boats).

The McKenzie dory (also known as a driftboat) was developed to run rapids, first on the McKenzie River in Oregon, and then the Rogue River, also in Oregon. The McKenzie dory was later modified and used on the Colorado River by early river boatmen, Martin Litton and P.T. Reilly.<sup>19</sup> Litton adopted the McKenzie boat by enlarging it and decking it over to provide storage.<sup>20</sup> He began providing commercial raft trips with these “Grand Canyon” dories in 1970, founding the outfitting company, Grand Canyon Dories.

Many of the original boats used in the Grand Canyon, including a wooden Galloway boat used between 1921 and 1923, one of Norm Nevills’ cataract boats, and a classic dory owned by P.T. Reilly, are being preserved for display at Grand Canyon National Park.<sup>21</sup>

Grand Canyon dory trips are still provided commercially; however, following World War II, the wooden boats were increasingly replaced by army surplus rafts and pontoons. While dories and driftboats do not have the widespread appeal of canoes and kayaks, they are used recreationally, most often for fishing, and as tenders used to service larger vessels.

### 2. Canoes

Canoes have a long history in North America, used for transportation, hunting, fishing, warfare, gifts, and ceremonies by Native Americans, likely for thousand of years before European settlers adopted the vessels.<sup>22</sup> These original canoes were built of dugout wood in the Pacific Northwest, and birchbark elsewhere.

In California, Native Americans in the North Coast region used Redwood trees to build dugout canoes. These canoes were used primarily for river travel.<sup>23</sup> The Chumash and Tongva Native Americans in Southern California built unique wood plank canoes or tomols.<sup>24</sup> Tomols were 10 to 30 feet long, and seaworthy. Tomols were integral to Chumash's identity and economy, used for ocean travel, hunting, and trading. Tomols were built using the same technology as Polynesian canoes.<sup>25</sup>

Canoes were adopted by settlers in the 1840s and 1850s for trade and hunting. Canoes were used in California for river travel, sometimes paddled by Native Americans, during the California Gold Rush.<sup>26</sup>

Between 1850 and 1880, canoes were first mass-produced on the East Coast, and were also used for leisure and recreation, including regattas and races. The first cedar-strip and canvas-covered canoes were produced in Peterborough, Ontario.<sup>27</sup> The American Canoe Association, the oldest non-motorized boating organization in the United States, was formed by a group of avid paddlers in 1880.<sup>28</sup> California was still engulfed in the Gold Rush era, and most Californian's were likely not using canoes for recreation at this time.

Canoe technology did not change much from the Peterborough wood and canvas canoes until the mid-1900's. The first fiberglass canoe was built in 1942 by Tom Johnson,<sup>29</sup> although fiberglass canoes did not become popular until the 1960s.

In 1944, an executive from Grumman Aircraft Engineering went on a canoe trip using a heavy wood and canvas canoe, and the concept of the aluminum canoe was born.<sup>30</sup> The company, looking to diversify as World War II was ending, developed a 13-foot, 38 pound canoe, and later built models up to 22 feet in length. These canoes were light, rugged, and affordable.

Grumman produced more than 300,000 canoes between 1945 and 1975, with production peaking in 1974 at 33,000, fueled by the energy crisis and popular movies of the time.<sup>31</sup> As aluminum canoes were replaced by plastic and fiberglass, sales dropped closer to 4,000 per year. Grumman eventually sold their canoe business; however, aluminum Grumman canoes are still being built at the original facility in Marathon, New York.<sup>32</sup>

While aluminum canoes were popular with the general canoeing public, a number of competitive canoeists were developing and designing lighter, faster, and more efficient canoes. In 1957, some of the first cloth laminated, high performance canoes were developed.<sup>33</sup> Marathon canoe racer Howie Labrant, of Chicago, published *The Principles of Canoe Design* in 1962, starting the era of modern, performance canoeing. By 1974, the first Kevlar canoes were built. Most of these canoe developments took place in the East and Midwest, with start-up companies such as Sawyer Canoe and Mad River Canoe.<sup>34</sup> Wooden canoes are still produced by a few specialty manufacturers, including Sierra Boat Company of Lake Tahoe.

While canoes have been surpassed by kayaks in the last ten years, they are still popular with many boaters. Canoes have clear niche markets, although less-so in California than the Midwest and Northeast.

Outrigger canoes, originally from Hawaii, are another specialty canoe type that is popular in California coastal regions. The first California outrigger canoe race, from Avalon to Newport

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Dunes, took place in 1959.<sup>35</sup> The sport, while still a niche, grew in Southern California, as did the production of fiberglass outrigger canoes. By 1965, there were 15 fiberglass boats and 7 outrigger clubs in California.<sup>36</sup> Today there are 22 Southern California Outrigger clubs and about 140 boats registered to race. The Northern California Outrigger Association also has 22 member clubs and approximately 140 boats.

### 3. Kayaks

Kayaks were first used by Native Americans such as the Inuit and Aleut, primarily in what is now Northern Canada, Greenland, and Alaska.<sup>37</sup> The original kayaks, meaning “hunter’s boat” were built by stretching seal skin over driftwood or whale bones. These kayaks also had air-filled seal bladders for stability, and were custom-fitted to each individual. Like canoes, early kayaks were unique in each region, with shorter and wider boats in the Bering Strait, and sleek and low kayaks in Greenland. Archeological evidence dates kayaks back at least 4,000 years.<sup>38</sup>

In 1905, German Hans Klepper purchased a design for a folding canvas kayak from a German student. These “folding kayaks” were sold and used for recreation, although use was very limited.<sup>39</sup>

Kayak racing became part of the Olympic Games in 1936, and kayaking clubs were popular in Europe. Steward Gardiner, an American, purchased a folding kayak and began kayaking on the Green River in October 1938 and on the Middle Fork of the Salmon River in 1939.<sup>40</sup>

In 1941, Alexander “Zee” Grant became the first person to kayak through the Grand Canyon, again using a folding kayak. Grant also founded the second major paddling organization, American Whitewater, and ran early descents of many other American rivers.<sup>41</sup>

Fabric covered kayaks were the norm until the 1950’s, when the fiberglass kayak was

introduced.<sup>42</sup> The first rotomolded plastic kayak was developed by Tom Johnson (father of the fiberglass canoe) in 1974.<sup>43</sup>

Plastic kayaks were further developed and produced in the 1980’s. Plastic kayaks could be produced in only a few hours, as compared to a day for fiberglass boats, significantly reducing the cost.<sup>44</sup>

In the late 1960’s and early 1970’s in California, a Czechoslovakian immigrant and whitewater racer, Josef Sedivec, began designing and developing whitewater racing kayaks in his garage.<sup>45</sup> The company is still one of the few California boat manufacturers. A number of other boaters worked on boat and paddle innovations in the 1980’s and 1990’s, many starting their own companies.<sup>46</sup>

The development of first fiberglass, then plastic, whitewater kayaks fueled a growing interest in the sport among a small group of avid boaters.<sup>47</sup> Whitewater kayaking first appeared in the Olympics in 1972. Several whitewater kayak pioneers such as Rob Lesser, Walt Blackadar, and Jim Stohlquist, conducted first descents down rivers in Idaho, Colorado, and Canada in the 1970’s, often on boats they built themselves.<sup>48</sup> Many of these early trips were filmed and publicized on adventure television shows.

Whitewater kayaking in California was pioneered in the late 1970’s and early 1980’s, with many first descents on California rivers by Lars Holbek, author of *Whitewater Guide to California*, and mountaineer and clothing manufacturer, Royal Robbins.<sup>49</sup> Robbins completed first descents on now commonly run rivers such as the San Joaquin, South Fork of the American, Upper Kern, Middle Fork of the Kings, and the Grand Canyon of the Tuolumne between 1980 and 1984.

Whitewater kayaking grew significantly in the 1990’s, fueled in part by the further development of boats, as well as the emergence of the “professional kayaker”, sponsored by boating companies.<sup>50</sup>

Sea kayaking started in the Seattle area in the 1960's, as a growing number of kayakers in the area switched from folding kayaks to homebuilt fiberglass boats.<sup>51</sup> Commercial production of fiberglass sea kayaks did not start until 1974, when some whitewater kayak builders started to build fiberglass sea kayaks. Interestingly, a number of sea kayak boat companies were started by former Boeing engineers after layoffs in 1972, at a time when outdoor sports in general were becoming increasingly popular.<sup>52</sup>

SEDA products in Southern California produced their first sea kayak in 1975.<sup>53</sup> Sea kayaking was introduced to Northern California by Bob Licht, who launched Sea Trek in Sausalito in 1982.<sup>54</sup> Licht, one of the first to have a rafting permit on the South Fork of the American River, sold the rafting company and switched to the tamer sea kayaking. By the 1990's, sea kayaking was expanding in Northern California, and the company has grown from six boats in 1982, to over 100 today.<sup>55</sup>

Sea kayaking continued to grow, and in the early 1980's, many of the early Seattle manufacturers met and formed the Trade Association of Sea Kayaking, now the Trade Association of Paddlesports.<sup>56</sup> *Sea Kayaker* magazine was formed in 1984 by one of these initial organizers, John Dowd. That year further cemented sea kayaking as an industry, with the West Coast Sea Kayak Symposium in Port Townsend, Washington.<sup>57</sup>

The plastic sit-on-top, or recreational kayak, which is fueling a significant growth in kayaking, was initiated through the efforts of several boaters. Bart Hauthaway, an Olympic canoeist, developed an open-topped pack canoe that started the movement towards the open-cockpit recreational kayak.<sup>58</sup>

Tim Niemier, a Malibu surfer put depressions in a surfboard and is credited with developing the first sit-on-top-kayak in the early 1970's.<sup>59</sup>

Niemier founded Ocean Kayak, one of California's few kayak manufacturers (now located in Washington). Ocean Kayak first produced fiberglass kayaks, before switching to rotomolded plastic in 1986.

Ann Dwyer of Kiwi Kayak is credited with developing user-friendly short, semi-decked, open-cockpit kayaks.<sup>60</sup>

Kayaks today have evolved to a dizzying variety of specialty boats – with boats designed specifically for surfing, crabbing, fishing, scuba diving, playboating, racing, and more.

### 4. Rafts

The era of inflatable rafts and catarafts began after World War II, when river runners pieced together army surplus vinyl rafts and pontoons.<sup>61</sup> These light, flexible boats were inexpensive, and could be modified to handle whitewater, many passengers, and provisions. These rafts were modified over the years, including a significant contribution from Californian Bryce Whitmore, who invented the self-bailing raft in 1967.<sup>62</sup>

Grand Canyon raft guide Georgie White began running the Colorado River in 1944, and developed a 35-foot "wave-buster" raft from army surplus pontoons.<sup>63</sup> She eventually made 200 trips down the river. What is believed to be the first river concession permit in the country was issued to Bus Hatch River Expeditions in 1953 on the Green River in Dinosaur National Monument.<sup>64</sup> From these small beginnings, the rafting guide business expanded in the mid-1960s.

In 1969, George Wendt, a former Los Angeles school teacher who spent summers on the Grand Canyon received the first permit for oar-powered, small rafts in the Grand Canyon, establishing Outdoor Adventure River Specialists (O.A.R.S.).<sup>65</sup> Wendt moved the business to Angels Camp, California in 1974, and started offering rafting

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trips on the Stanislaus River (before it was buried under New Melones Reservoir), as well as the American and Tuolumne Rivers. O.A.R.S. has since expanded to become one of the largest river companies in the West.<sup>66</sup>

Another California rafting pioneer, Bill McGinnis, became a river guide at age 16, and following graduation from San Francisco State University founded Whitewater Voyages in 1975, “with two rafts and a \$500 gift from his grandmother.”<sup>67</sup> Whitewater Voyages is California’s largest whitewater rafting company, and annually runs about 22,000 people down seven California rivers. McGinnis has also developed guidebooks for river guides, and is active in promoting the industry.<sup>68</sup>

River rafting in California has grown from a few pioneer rafting companies in the 1970s to about 100 companies today, providing trips on over two dozen rivers. The South Fork of the American River is one of the most-used rivers in the United States, with over 70,000 commercial rafting participants in 2006.<sup>69</sup>

The “rafts” category of non-motorized boats also includes other inflatable rafts and boats that are not used for whitewater boating. There are a large number of inflatable boats used more recreationally on small lakes and calm rivers, as well as inflatable boats used as tenders. In some cases, there is a very gray line between an inflatable that would be considered a boat, and an inflatable that would be considered a toy. Generally, inflatable boats are low-cost, and thus attractive to first-time boat buyers.

## 5. Rowing Boats

Rowing is recognized as one of the oldest organized sports, with races held in England in the 1700’s.<sup>70</sup> The first rowing race in the United States took place in New York in 1807, and boat clubs were established in several Eastern cities in the early 1800’s.<sup>71</sup> Yale organized the first collegiate boat

club in 1843, followed by Harvard in 1844. The first intercollegiate athletic contest in the United States was a Harvard versus Yale rowing race in 1852. Rowing was extremely popular in the mid 1800’s, with both amateur and professional races.<sup>72</sup>

With the exception of Athens in 1896, rowing has been included in every modern Olympic Games. While the popularity of rowing has declined since the late 1800’s, replaced by numerous other sports (aquatic and otherwise) there are still thousands of rowing participants in California.

Rowing came to California a few years after it was popularized in the East. The University of California, Berkeley, established in 1868, started a rowing program that same year.<sup>73</sup> The first Pacific Coast Intercollegiate Regatta between the University of Washington and the University of California took place in 1903.<sup>74</sup>

In San Francisco, two private rowing clubs followed Berkeley’s program: the South End Rowing Club was formed in 1873, and the Dolphin Club was formed in 1877.<sup>75</sup> Rowing in Southern California started a few years later, with the Excelsior Rowing and Swim Club (later called the San Diego Rowing Club) forming in 1888, and the country’s first women’s rowing club, ZLAC, forming in San Diego in 1892.<sup>76</sup> Rowing continued to have a small but avid following since the days of these early clubs, although its popularity waned during wartimes.<sup>77</sup> All of these early California organizations, as well as many others, are still rowing today.

Competitive and recreational rowing are still popular in California, with 68 rowing clubs within the national governing organization, U.S. Rowing, including intercollegiate programs, either club or NCAA, at most California universities.<sup>78</sup> San Diego hosts one of the premier rowing regattas, the San Diego Crew Classic®.<sup>79</sup> The Classic, started in 1973, has become one of the biggest rowing events in the United States.

### 6. Small Sailboats (Eight (8) feet in length or shorter)

While sailing has been a popular form of boating recreation for over 100 years, the small sailboat was not introduced until the late 1930s.<sup>80</sup> In 1938, New Yorker Charles MacGregor published a design for a small sailing dinghy, the MacGregor Sabot, in *Rudder Magazine*.<sup>81</sup> Two residents of the Naples District in Long Beach, California, were looking for a small sailing dinghy, and modified the MacGregor plans for their own use. The original two Naples Sabots were built by Roy McCullough and R. A. Violette in Violette's garage during World War II. Early Sabots were built from plywood, although now many are made with fiberglass.<sup>82</sup>

Official plans for the boat, which was garnering attention in the Long Beach area, were drawn up in 1946, and the Naples Sabot One-Design Association was established in 1946.<sup>83</sup> The boats, which were popular for teaching beginners and racing, spread to other yacht clubs in Southern California. In 1947 there were 100 Sabots in existence, and 66 additional Sabots were built in 1948. The popularity of the Naples Sabot increased in May 1949, when a four-page illustrated article on the boat appeared in *Popular Mechanics Magazine*.<sup>84</sup> The Naples Sabot One-Design Association received requests for Sabot plans from around the United States and the world. According to the Mission Bay Yacht Club in San Diego, about 10,000 Sabots have been built, and 170 boats competed in the last Junior Sabot Nationals.<sup>85</sup>

Like the Sabot, another popular small sailing dinghy, the El Toro, was designed in the late 1930s, based on MacGregor's Sabot plans.<sup>86</sup> The El Toro was developed by the Richmond Yacht Club in the San Francisco Bay Area, filling a need for a training boat and yacht tender. El Toros are the most popular sailing dinghy on the San Francisco Bay, and are used extensively for teaching and racing.<sup>87</sup> There are about 11,000 El Toros in existence (anywhere), although only about 1,000 are currently active in California.<sup>88</sup>

The Optimist is a third category of small sailboat. Optimists (or "Opti's"), are a national and international racing class for children under fifteen years old.<sup>89</sup> These boats were introduced in South Florida in the 1950's. Optimists have historically been popular on the East Coast and internationally. Over the last five years, Optimists have been introduced to the San Francisco Bay Area and Southern California, and are becoming increasingly popular in California. Reportedly a number of California yacht clubs are purchasing these boats for their junior learn-to-sail programs.<sup>90</sup>

### 7. Sailboards or Windsurfers

The invention of the sailboard is credited to S. Newman Darby in Pennsylvania in 1964.<sup>91</sup> Darby had experimented with various hand-held sail systems since the late 1940's, but did not come up with the sailboard design, using a universal joint on the mast foot, until 1964.<sup>92</sup> Darby and family members applied for a patent and attempted to manufacture sailboards, but the operation never got off the ground, and the patent application was dropped. Darby published sailboard plans in *Popular Science*, and continued to sell plans.<sup>93</sup>

In Southern California in the late 1960's, sailor Jim Drake and surfer Hoyle Schweitzer designed a "windsurfer", a cross between these two activities.<sup>94</sup> The windsurfer was intended to provide the benefits of sailing, without the cost and inconvenience.<sup>95</sup> Drake and Schweitzer applied for a patent in 1968, and in 1970 established Windsurfer International, and began manufacturing sailboards, first in Schweitzer's garage, and later moving to a manufacturing facility in Torrance.<sup>96</sup>

Windsurfing did not gain popularity in California (or the rest of the United States) until late in the 1970's; however, the sport caught on in Europe in the early 1970's.<sup>97</sup> Windsurfing eventually caught on in California, and in other locations such as the

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Columbia River Gorge, in Oregon. Today, windsurfing does not have the mass popularity it did in the 1980's and early 1990's. However, there is still a niche following in the sport.

## 8. Kiteboards

While kites have been used to propel vehicles and vessels as far back as the 12<sup>th</sup> century, kiteboarding (also called kitesurfing) is the newest of the non-motorized boating activities described in this report. The first kiteboarding companies were established approximately ten years ago.<sup>98</sup> Kiteboarding was developed simultaneously by father-son engineers and waterskiers, Bill and Corey Roeseler of Seattle, and brothers Dominique and Bruno Legaignoux of France, both sailors and windsurfers.<sup>99</sup> The Roeseler's developed and patented the "kiteski", water skis powered by a two line kite controlled via a bar mounted winch/brake.<sup>100</sup> At about the same time, the Legaignoux's were focusing on kite technology, and developed an inflatable kite that could be relaunched from the water.<sup>101</sup>

Both families started manufacturing kiteboards in 1994, although they were slow to gain market attention. Windsurfers Laird Hamilton and Manu Bertin were important in popularizing kiteboarding when they demonstrated the "extreme sport" in Maui in 1996.<sup>102</sup> The first kiteboarding competition was held in 1998, and several kiteboarding schools opened at that time. The technology behind kiteboards has continued to evolve, with variations in kite types and safety improvements.<sup>103</sup>

In 1998, there were an estimated 30 kiteboarders worldwide, a number that had grown to over 150,000 by 2006.<sup>104</sup> The recent development of kites that can be easily "powered down" to avoid accidents may increase the popularity of the sport.

Kiteboarding is popular in certain areas in California, with Santa Cruz being one of the top kiteboarding locations in the world.<sup>105</sup> Kiteboarding is increasingly popular in the San Francisco Bay Area.

## 9. Dragon Boats

Dragon boat racing has a history dating back over 2,000 years in China; however, it has become popular in California over the last eleven years.<sup>106</sup> The California Dragon Boat Association was established in 1996, and the San Francisco International Dragon Boat Festival just celebrated its eleventh year in September 2006.<sup>107</sup>

Dragon boat racing was popularized by the Hong Kong Tourism Association, which started shipping dragon boats to other countries to promote tourism around 2000.<sup>108</sup> Since 2000, dragon boat racing has become an organized international sport. Worldwide, there are an estimated 20 million to 50 million dragon boat racing participants.<sup>109</sup> According to California Dragon Boat President Linda Chieu, dragon boat racing is a fast growing sport.<sup>110</sup>

There are currently dozens of club, college, high school, and youth dragon boat teams in California, with the majority based in the San Francisco Bay Area and Southern California. Proponents of dragon boating note that it is a "valuable cultural, social, and community sport that promotes awareness, teamwork, and diversity."<sup>111</sup>

## B. Law and Regulation Issues Related to Non-Motorized Boating

In this report subsection, we discuss (1) definition issues related to non-motorized boating, (2) high level law and regulation issues related to non-motorized boating, and (3) an overview of access to waterway issues for non-motorized boating. All three of these non-motorized boating issue areas have considerable ambiguities and open-ended resolutions. Consequently, we present these three issue areas at a high overview level.

### 1. Definition Issues Related to Non-Motorized Boating

A starting definition of non-motorized boats in California could be as follows: vessels propelled solely by oars or paddles; sailboats eight (8) feet and under without motors; sailboards; and kiteboards. This definition essentially excludes those vessels required to be registered by the California Department of Motor Vehicles (DMV).

DMV requires the following vessels to be registered:<sup>112</sup>

*Generally, every sail-powered vessel over eight feet in length, and every motor-driven vessel (regardless of length), that is not documented by the U.S. Coast Guard which is used, or on the waters of this State, are subject to registration by the Department of Motor Vehicles. The vessel must be located in California.*

The DMV term “vessel” applies to every description of water-craft used, or capable of being used, as a means of transportation on water, except the following:

A seaplane on the water

A watercraft specifically designed to operate on a permanently fixed course and guided by a mechanical device that restricts the watercraft’s movement to the fixed course

A floating structure that is designed and built to be used as a stationary waterborne residential dwelling, which, (a) does not have, and is not designed to have, a mode of power of its own, (b) is dependent for utilities upon a continuous utility linkage to a source originating on-shore, and (c) has a permanent, continuous hookup to a shore-side sewage system.

The following vessels do not have to be registered in California:

Vessels propelled solely by oars or paddles

Non-motorized sailboats that are eight feet, or less, in length

Non-motorized surfboards propelled by a sail and with a mast that the operator must hold upright

A ship’s lifeboat (a dinghy is not a lifeboat)

Vessels currently and lawfully numbered (registered) by another state that are principally used outside California

Vessels brought into California for racing purposes only (exempted only during races and tune-ups).

Commercial vessels of five (5) net tons, or more, or thirty (30) feet, or more, in length, must be registered (documented) by the U.S. Coast Guard.

The United States Coast Guard (Coast Guard), in contrast to the California DMV, broadly defines the word “vessel” to include every description of watercraft, including non-displacement craft and seaplanes, used or capable of being used, as a means of transportation on water.<sup>113</sup> A non-motorized boat, for purposes of this non-motorized boating study, may be a vessel as the term is used by the Coast Guard, but a vessel (at least as defined by the Coast Guard) is not necessarily a non-motorized boat.

Likewise, the Coast Guard defines the terms “power-driven vessel” to mean any vessel propelled by machinery, and “sailing vessel” to mean any vessel under sail, provided that propelling machinery, if fitted, is not being used. A non-motorized boat for purposes of this non-motorized boating study is not a power-driven vessel as defined by the Coast Guard, but it could be a sailing vessel, if it were short enough in length.

A sailboard is considered a vessel by the Coast Guard. The Coast Guard considers the terms “sailboard” and “windsurfer” synonymous. A sailboard is not considered like a surfboard, or sporting goods equipment, by the Coast Guard. A sailboard is subject to the Federal Navigation Rules of the Road (as are other vessels), but it is not subject to Coast Guard life jacket regulations. A sailboard is subject to life jacket requirements imposed by the State of California.

A non-motorized boat for purposes of this non-motorized boating study essentially includes non-powered watercraft (such as canoes, kayaks, inflatable boats, and rowing boats), and wind powered

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watercraft (such as small sailboats, sailboards, and kite boards). The non-powered watercraft are propelled with paddles, oars, or poles; and the wind powered watercraft have no propelling machinery whatsoever, and are relatively short in length.

A surfboard is usually hand and/or wave powered (it is not propelled by paddles, oars, or poles); and it is not propelled by the wind, and hence usually a surfboard is not a non-motorized boat for purposes of this non-motorized boating study. Likewise, inner tubes (hand and current propelled), and fisherman float tubes (fin and current propelled), also are not considered non-motorized boats for purposes of this non-motorized boating study.

There are a few exceptions where large custom surfboards may be propelled by the operator standing on the board, and using long paddles (stand-up, paddle surfing). These kinds of specialized surfboards are considered a non-motorized boat for purposes of this non-motorized boating study, and these kinds of surfboards are classified into the “other” non-motorized boat category.

The above “first order” definition of non-motorized boats seems reasonable, until one further starts considering the varying nuances and ambiguities that can occur in practice. In classifying non-motorized boats for the statewide and regional random surveys in this non-motorized boating study, we identified seven (7) broad, non-motorized boat categories as follows:

1. *Canoes*
2. *Kayaks*
3. *Inflatable Boats and Rafts*
4. *Small Sailboats (eight (8) feet in length or shorter)*
5. *Rowing Boats (including row boats, shells, sculls, dories, and drift boats)*
6. *Sailboards and Kiteboards*
7. *Other Non-Motorized Boats.*

Specific types of non-motorized boats within only two of these seven categories (#2 and #6, above) clearly fall within the non-motorized boat and non-registered California universe – namely kayaks and sailboards/kiteboards. All of the other five categories (#1, #3, #4, #5, and #7) include what we call some “gray-area” non-motorized boats.

Many canoes, inflatable boats, and rowing boats can be used interchangeably with, or without, motors. In DMV language, these boats may not be propelled **solely** by oars or paddles. Although any boat with a motor should technically be registered with DMV, in reality these small boats may, or may not, be registered with DMV.

Precise quantification of the extent of the non-motorized boat universe that overlaps with DMV’s registered boat definition system can be unclear. **Table 6.1**, on the next page, shows the gray areas related to non-motorized boat definitions for California.

For purposes of this non-motorized boating study, we tried to exclude **any** boat that was already registered with DMV from our study definition of a non-motorized boat. As Table 6.1 illustrates, we may have included some boats in our study definition that technically should not be included, and excluded some boats that could be included.

The inclusion of the “gray-area” non-motorized boats within **Category A**, in Table 6.1, in the statewide random survey leads to some over-estimation of the number of non-motorized boats in California. These boats, which may be used both with motors, and without motors, should be registered according to DMV requirements. Thus, these boats technically should not be within our estimation of non-motorized boats. However, there may be owners that do not register these boats, particularly if they often use these boats without a motor.

**Table 6.1**  
**“Gray-Area Non-Motorized” Boats in California**

Boats Included in this NMB Study Resulting in Potential Over-Estimation	Boats Excluded from this NMB Study Resulting in Potential Under-Estimation	
<p><b>Category A</b></p> <p>Boats with/without motors that should be DMV registered, but are not, which could include:</p> <ul style="list-style-type: none"> <li>a. Canoes with/without motors</li> <li>b. Inflatable boats and rafts with/without motors</li> <li>c. Rowing boats (including row boats, shells, sculls, dories, drift boats) with/without motors</li> <li>d. Sailboats greater than 8 feet in length with/without motors</li> <li>e. Sailboats 8 feet in length or shorter with/without motors</li> <li>f. Other boats with/without motors</li> </ul>	<p><b>Category B</b></p> <p>Boats without motors that are currently DMV registered, but do not technically require DMV registration, which could include:</p> <p style="padding-left: 20px;">Kayaks</p> <ul style="list-style-type: none"> <li>a. Canoes</li> <li>b. Inflatable boats and rafts</li> <li>c. Rowing boats (including row boats, shells, sculls, dories, drift boats)</li> <li>e. Sailboats 8 feet in length or shorter</li> <li>f. Other boats propelled solely by oars or paddles</li> </ul>	<p><b>Category C</b></p> <p>Boats that are used with/without motors that are currently DMV registered, which could include:</p> <ul style="list-style-type: none"> <li>a. Canoes with/without motors</li> <li>b. Inflatable boats and rafts with/without motors</li> <li>c. Rowing boats (including row boats, shells, sculls, dories, drift boats) with/without motors</li> <li>d. Sailboats greater than 8 feet in length with/without motors</li> <li>e. Sailboats 8 feet in length or shorter with/without motors</li> <li>f. Other boats with/without motors</li> </ul>

Boaters in this Category A were included within our primary data surveys and had input on non-motorized boating facilities and issues. Including these Category A boats did not result in double-counting with a separate DBW study of primarily motorized boats, the *California Boating Facilities Needs Assessment (BNA)*, because these boats were not within DMV registration records.

The exclusion of the “gray-area” non-motorized boats within **Category B**, in Table 6.1, from the statewide and regional random surveys resulted in an under-estimation of the number of non-motorized boats. It is likely that some non-motorized boat owners register their boats with DMV, even though DMV registration is not technically required. These non-motorized boat owners may perceive benefits, such as proof of ownership, from DMV registration. These Category B boats are already included in the BNA, so although they could more accurately be included within this study of non-motorized boats, they have at least been included in another statewide DBW study.

Excluding boats within **Category C**, in Table 6.1, did not technically result in under-estimation of the number of non-motorized boats. These boats are technically required to be DMV registered, so they are correctly excluded from the study. However, these are the same types of boats as Category A, except Category C boats are DMV registered. Including these Category C boats would result in double-counting boats that are in the BNA. It is possible that some boaters rarely use these DMV registered boats with a motor, in which case we did not obtain survey input from this portion of non-motorized boaters.

While we recognize that our definition of non-motorized boats resulted in some over-estimation, and some under-estimation, of the number of California non-motorized boats, it was important to try to draw clear lines of distinction around the potential universe of non-motorized boats. It is possible that Category A “over-estimation” boats may have been offset one-for-one by Category C “under-estimation” boats, resulting in little survey estimation bias, for purposes of this non-motorized boating study. Category B boats could

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thus result in some small, net under-estimation of non-motorized boats.

Any boat registered with DMV was clearly already within the universe of boats analyzed in the prior *California Boating Facilities Needs Assessment*. Including these boats within this non-motorized boating study would have resulted in double-counting vessels.

As of December 31, 2005, DMV registered 8,086 rowboats, 950 kayaks/canoes, and 5,541 other hand propelled vessel types, out of 963,758 total registered vessels in the State. Presumably, some of these rowboats and kayaks/canoes were used with, and without, motors. It is questionable why any hand propelled vessels were ever registered at all with the State DMV. Going forward, a clearer California DMV definition of boats that must be registered in the State, and better enforcement of DMV boater registration, could help alleviate some of these challenges associated with obtaining a more precise definition of non-motorized boats, and with categorization of “gray-area” non-motorized boats.

Without legal clarification at the federal and/or state levels, the definition of non-motorized boats will continue to remain ambiguous. There are numerous characteristics that help describe non-motorized boats, including: length, use of a motor, acquisition costs, where purchased, boat construction materials, propulsion variant, and how and where the vessel is used. Unfortunately, each of these characteristics has its own set of ambiguities. If one then combines these numerous characteristics, there can be even more ambiguity – for example in the extreme: Is a short, but expensive, vessel a non-motorized boat? Is a long, but inexpensive vessel, a non-motorized boat?

The statewide random survey did not include a question about the length of a respondent’s non-motorized boat (with the exception of small sailboats, which were specifically defined in

California law by length). Depending on the type of vessel, non-motorized boats can range from only a few feet long, to over sixty feet long. How would one realistically utilize length in a non-motorized boat definition? A kayak or kiteboard may be less than four feet in length, and yet be classified as a non-motorized boat. An inflatable raft of only four feet in length would likely be classified as a “toy”, but at exactly what length does that inflatable raft shift from being a “toy” to a non-motorized boat?

Many non-motorized boats, including inflatable boats, canoes, and sailboats, can be used with, or without, motors (either gasoline or electric). Legally, if the owner has a motor for their boat, it must be registered with DMV. However, many such vessels may not be registered, and many such vessels may be used primarily without a motor. In these cases, even though the boat is not technically defined as non-motorized, it is being used as a non-motorized boat. Some of these kinds of boats may be defined as non-motorized in this study.

The type of propulsion is typically one of the defining characteristics for a non-motorized boat. If the vessel is propelled by paddles or oars, as in the partial study definition, it would typically be classified as a non-motorized boat. Do the paddles or oars have to be of a certain length, to qualify? The study definition also included wind-propelled vessels, such as small sailboats, sailboards, and kiteboards. There also are inflatable boats, kayaks, and canoes that are propelled with sails which were included within our definition. Many types of vessels, including inflatable boats, are used with different propulsion methods at different times: with a motor, with paddles, with a sail, or simply floating. The same vessel may be used by any one of these different methods, on any given day.

How much an individual spends on a vessel may be another means to categorize it as a non-motorized boat, as compared to a “toy”. Like the

other characteristics, there is also ambiguity related to costs. Where does one draw the line between expenditure for a “toy”, and expenditure for a boat? If one spends less than \$50 on an inflatable item, they are likely purchasing a toy. But when does it become a non-motorized boat? At \$100? At \$200? At \$300? What about purchase prices for used inflatable vessels? Furthermore, one can spend a significant amount of money on “toys”, at any age.

Another characteristic that could be factored into the definition of non-motorized boats is where it was purchased. If a vessel was purchased at a specialty boating store, should it be classified as a non-motorized boat? Can one also purchase floating “toys” at these boating stores? Conversely, if an item was purchased at “Big 5” or “Wal-Mart”, is it not a non-motorized boat? What if an inflatable boat was purchased at “Wal-Mart” and it cost \$200, and it was 12 feet long with wooden paddles? There is simply too much variability in the types of products available at different consumer outlets to put much weight on purchase location as a defining factor for non-motorized boats.

The type of construction material for a non-motorized boat could be another defining factor. Certainly, a hard-shell plastic or fiberglass vessel would typically be classified as a non-motorized boat. Conversely, a thin vinyl float toy is not classified as a non-motorized boat. Once again, there is a significant level of ambiguity in between these two extremes. Is a thicker vinyl inflatable boat a non-motorized boat? How thick? Exactly what blend of plastic, canvas, and/or rubber construction material is required for a non-motorized boat? Does an inflatable non-motorized boat have to be made of PVC, rubberized canvas, or hypalon fabric?

Another defining characteristic may be how, or where, the non-motorized boat is used. Of course, a vessel can be used in many ways, and in many different types of waters. If one only uses an inflatable boat in their swimming pool, then perhaps it would be classified as a toy (even if it

cost \$1,000). If one only uses an inflatable boat to paddle in lakes, then perhaps it would be classified as a non-motorized boat (even if it cost \$300). But what about a small pond? Is there a size of waterway where the non-motorized boat use definition would switch from “toy” to boat?

Both the statewide and active-user surveys show that participants used their non-motorized boats for a wide variety of purposes, ranging from recreation, to competition, to transportation. Participants also utilized these non-motorized boats in a wide variety of waterways, ranging from local ponds to the Pacific Ocean. How would one classify certain activities, or locations, as non-motorized boating, and others as not?

## 2. Law and Regulation Issues Related to Non-Motorized Boating

There is Federal Law and State of California Law related to non-motorized boats and boating. Also, there are National and State Park requirements, and finally local jurisdiction (city, county, and water district) regulation requirements regarding use of non-motorized boats. Local governments regulation of recreational boating in waters within their jurisdiction can include access restrictions; time-of-day restrictions; speed zones; special-use areas; prohibitions on consumption of alcoholic beverages on certain waterways during holiday periods; and sanitation and pollution controls.

The United States Congress and the California Legislature have enacted laws to (1) standardize safe vessel construction, (2) adopt rules of the road, and (3) provide boating safety programs to enhance safety and save lives. Following are four of the more significant Federal laws, and one of the more significant California laws, that have shaped boating safety programs for the California boating public, including non-motorized boating.

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## FEDERAL LAWS

### *The Motorboat Act of 1940*

This Act set up the different classes of recreational boats. The Act required minimum equipment for boats, and made the boater responsible for the equipment.

### *The Federal Boating Act of 1958*

This Act required the operator of any boat involved in an accident causing personal injury to stop, render assistance, offer identification, and file a written report. Based on statistics published by the Coast Guard, the Act allowed the Coast Guard to make findings and recommendations about the prevention of accidents. The Act also permitted the Coast Guard to impose civil penalties for negligent operations. The Act required the numbering of all undocumented vessels propelled by machinery of more than ten horsepower. The Act promoted boating safety and cooperation between the states and federal government in the interest of uniformity of boating laws.

### *The Federal Boat Safety Act of 1971 (as Codified in Title 46 USC)*

This Act established minimum safety standards for boats and associated equipment; authorized financial assistance to the states; directed that a Boating Safety Advisory Council be established; provided for the numbering of all undocumented vessels equipped with propulsion machinery; provided penalties for negligent operators; prescribed duties related to marine casualties assistance and information; allowed the Secretary to prescribe regulations; set manufacturer's standards and defective vessel recalls; allowed the Coast Guard to terminate unsafe operation; and prescribed registration standards for states to follow. The U.S. Coast Guard became the official regulatory authority in Federal waters for matters under the Federal Boat Safety Act of 1971.

### *The Surface Transportation Assistance Act of 1982*

This Act encouraged greater and continuing uniformity of boating laws and regulations among states and the federal government; a higher degree of reciprocity and comity among these several jurisdictions; and closer cooperation and assistance between the federal government and states. States that had an approved safety program could apply for financial assistance.

## CALIFORNIA LAWS

The following is the most significant California legislation shaping boating safety programs for the Californian boating public.

### *California Harbors and Navigation Code (Sections 650 through 674)*

Chapter 5, Article 1, Sections 650 through 674, of the Harbors and Navigation Code, provides statutory authority for the California Department of Boating and Waterways to promote safety for persons and property in, and connected with, the use and equipment of vessels, and to promote uniformity with Federal laws relating thereto.

\* \* \* \* \*

California boating law is also found in excerpts from California Corporations, Education, Fish and Game, Government, Health and Safety, Penal, Public Resources, Unemployment Insurance, Vehicle, and Water Codes; and the California Code of Regulations.

With regards to State of California law, non-motorized boats were purposefully defined to not include any boat that was required to be registered with the California Department of Motor Vehicles as a vessel. Therefore, Federal, and State of California, Vessel Registration Laws are inapplicable to non-motorized boats.

Besides Vessel Registration Laws, two applicable areas of non-motorized boating law are Boating Safety Laws and Navigation Rules (International and Inland). We do not attempt to address the extensive body of Federal and State of California Boating Safety Laws (including safety equipment requirements), or Federal Navigation Rules, herein, as far as they pertain, or do not pertain, to non-motorized boats.

In lieu of an exhaustive review of Federal and California laws applicability to non-motorized boats, we provide a few examples of selected Federal and State laws application to non-motorized boats.

### a. Boating Safety Equipment for Non-Motorized Boats

There are many categories of boating safety equipment requirements, both Federal and State of California, such as fire extinguishers, marine sanitation devices, running and anchor lights, visual distress-signaling devices, sound producing devices, life jackets, etc. Below, we use life jackets as an example of the various safety equipment requirements for non-motorized boats.

#### *Federal Life Jacket Requirements for Non-Motorized Boats*

Federal life jacket requirements for non-motorized boats are guided by the Code of Federal Regulations, Title 33 (Navigation and Navigable Waters), Chapter I (Coast Guard, Department of Homeland Security), Part 175 (Equipment Requirements). Part 175.11, Life Jacket Applicability, applies to all recreational vessels that are propelled, or controlled, by machinery, sails, oars, paddles, poles, or another vessel.

Under Federal law, no person may use a recreational vessel unless at least one life jacket (either Type I, II, III, or V, and must be U.S.C.G. approved) is on-board for each person. For a recreational vessel 16 feet or more in

length, in addition to the above life jacket requirements per person, one Type IV life jacket is required. Also, no person may operate a recreational vessel with any child under 13 years old aboard unless each such child is either wearing an appropriate life jacket, approved by the U.S. Coast Guard, or is below decks, or in an enclosed cabin.

**Table 6.2**, on the next page, summarizes Federal life jacket requirements for non-motorized boats. “Large” canoes and large kayaks, and some “racing” non-motorized boats (including shells and sculls) have some Federal life jacket requirement exemptions.

Sailboards are exempted from Federal life jacket requirements, though it is not clear if kiteboards are also exempted. At the time of this writing, the U.S. Coast Guard confirmed that the life jacket exemption for sailboards had not been formally extended to kiteboards, through either the Code of Federal Regulations, or updates in the Federal Register. Coast Guard spokesmen stated it is presumed that local California Coast Guard Stations probably, in practice, treat kiteboards like sailboards, with regards to the life jacket requirement.

Legally, California could decide to establish their own sailboard life jacket carriage requirements, though it has not done so at this time. The State may determine whether or not life jackets should be worn and/or carried on sailboards, based on climate and navigation conditions within its boundaries.

The precise definition of each non-motorized boat impacts its applicability to life jacket standards. For example, a “racing” canoe and a “racing” kayak are exempted from Federal life jacket requirements, but a normal canoe and a normal kayak are not exempted, unless they are a large canoe or large kayak, and then they are exempted only from the Type IV requirement.<sup>114</sup>

**Table 6.2**  
**Federal Life Jacket Requirements for Non-Motorized Boats**

Non-Motorized Boat	Less than 16 Feet	Greater than, or Equal to, 16 Feet
1. Canoe	Required	<i>Exempted from Type IV life jacket</i>
Racing Canoe	<i>Exempted</i>	<i>Exempted</i>
2. Kayak	Required	<i>Exempted from Type IV life jacket</i>
Racing Kayak	<i>Exempted</i>	<i>Exempted</i>
3. Inflatable Boat/Raft (with paddles)	Required	Required
4. Small Sailboat	Required	Required
5. Rowing Boat	Required	Required
Row boat	Required	Required
Shell (racing)	<i>Exempted</i>	<i>Exempted</i>
Scull (racing)	<i>Exempted</i>	<i>Exempted</i>
Dory	Required	Required
Drift Boat	Required	Required
6. Sailboard	<i>Exempted</i>	<i>Exempted</i>
7. Kiteboard	Required	Required
8. Other	Required	Required

Another non-motorized boat definition example is an inflatable boat or raft, used without paddles or oars, of any kind, and hence this boat may not even be considered a recreational vessel for Federal purposes, and thus could be totally exempted from the Federal life jacket requirements, not unlike a toy inner tube.

***California Life Jacket Requirements for Non-Motorized Boats***

In addition to Federal life jacket laws, under State of California law (California Boating Law, Section 658) every person who operates a non-motorized boat that is 26 feet, or less, in length must have every person onboard who is 11 years of age, or less, wearing a Type I, II, III, or V life jacket, unless the person is restrained by a harness tethered to the vessel, or is in an enclosed cabin. Therefore, California life jacket law has a lower age requirement than the Federal child definition, and also has a tether condition.

California law takes precedence over Federal law with regard to the child life jacket requirement on all State waters. Except for the difference in child life jacket law between Federal law and California law, California adopts all the Federal life jacket requirements in Table 6.2.

**b. Navigation Rules for Non-Motorized Boats**

The body of Federal Navigation Rules (“rules-of-the-road”) is lengthy and complex. Copies of these rules may be obtained from the Superintendent of Documents, U.S. Government Printing Office. The Navigation Rules establish actions to be taken by vessels to avoid collision. The Rules are divided into two parts, Inland and International. Inland Rules apply to vessels operating inside the line of demarcation, while International Rules apply outside the line of demarcation.

Demarcation lines divide the high seas from harbors, rivers, and other inland waters of the United States, for the purpose of determining the applicability of Inland Rules in lieu of the International Rules. International Rules are tantamount to the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS), while the Inland Rules are synonymous with 33 Code of Federal Regulations 80 of the United States Code.

The State of California generally has no “rules-of-the-road” of its own, and adopts Federal requirements in this area. California adopts the Federal “rules-of-the-road” by reference, through Title 14 of the California Code of Regulations, and the Federal Inland Navigation Rules are summarized in California Boating Law.

What vessels are required to comply with the Navigation Rules? In Rule 3, the word *vessels include every description of watercraft, including non-displacement craft and seaplanes, used or capable of being used as a means of transportation on water*. Courts have interpreted transportation to not just include passengers, but also goods and services. The navigation rules address vessels, not whom or what is controlling them.

Where do kayaks, canoes, etc. fit into the Navigation Rules? Neither the International nor Inland Navigation Rules address these non-motorized boats per se, except with regards to “vessels under oars” in Rule 25, regarding lights. One could infer that a “vessel under oars” should be treated as a “sailing vessel” since it is permitted to display the same lights as one, but, ultimately the issue of “whom ‘gives way’ would fall to” could be required by the ordinary practice of seamen, or by the special circumstances of the case (Rule 2).

Sailboats generally have different Navigation Rules than power-driven vessels. Generally, non-motorized boats are treated more like sailboats

under the Federal Navigation Rules. For example, if the vessel is propelled under oars at night, it should display lights like a sailboat, if practical. As an option, the non-motorized boat may carry a flashlight or lighted lantern that can show a white light in sufficient time to prevent collision.

Since Navigation Rules 1 through 11 apply to all vessels, these presumably would apply to non-motorized boats. Rules 9 and 10 may be the most applicable to non-motorized boats. Rule 9 states that vessels of less than 20 meters shall not impede the passage of a vessel which can safely navigate only within a narrow channel or fairway. Rule 10 says that a vessel of less than 20 meters may use inshore traffic zones; however, they shall not impede the safe passage of a power-driven vessel following a traffic lane.

The Navigation Rules do not clearly cover a whole host of possible situations for non-motorized boats. According to the Coast Guard, two principles come into play when situations are not specifically covered by “rules-of-the-road”, namely Relative Maneuverability and Negligent Operation. Under the principal of Relative Maneuverability, whichever vessel can best avoid a collision under the circumstances is generally required to keep clear. Under the principle of Negligent Operation, one cannot operate a vessel in violation of common sense or without using reasonable precautions.

What some of these Navigation Rules may mean is that non-motorized boats should, whenever possible, stay out of channels used by large vessels. This issue of non-motorized boat interference has become an occasional problem with small sailboats, sailboards, kiteboards and even kayaks that operate in parts of California’s San Francisco and Santa Monica Bays, near the vicinity of big commercial ships.

Although the Rules of the Road apply to human-powered boats and beachable sailcraft,

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they are not specific to these types of recreational boats. The Rules lack codes of conduct for interactions between certain vessel types that are common on the State’s waters, including sailboats and kayaks. Regardless of the type of interaction, the Rules oblige a boater to try to avoid collision. In practical application, this usually means that smaller, more maneuverable boats (albeit non-motorized) will have to get out of the way of a larger vessel.

A safety issue with non-motorized boaters is that paddle boaters and board sailors are not well-connected with some sources of maritime safety and security information. For example, the number of human-powered boaters carrying VHF radios is limited.

### **c. Summary of Safety Laws and Navigation Rules Related to Non-Motorized Boating**

In general, most navigation rules are applicable to non-motorized boats, but many safety equipment carriage requirements may not be applicable. This distinction can create confusion for non-motorized boats. On the one hand, non-motorized boats are generally treated as “serious” vessels as far as “rules-of-the-road” are concerned, but non-motorized boats may be treated essentially as “toys” as far as some safety equipment requirements are concerned.

Some non-motorized boats are caught in the dilemma of being treated more as a novelty craft used as a swimming toy, than a vessel used or capable of being used for transportation. Some non-motorized boaters are concerned they may lose “rules-of-the-road” privileges and responsibilities, as well as being banned (like inner tubes, for example) from some waters.

With the proliferation and evolution of non-motorized boats, it would be prudent to review relevant Federal and State of California boating

laws for applicability to non-motorized boats. It would be helpful to clarify these laws’ application to non-motorized boats, including consistency across the various categories of non-motorized boats, especially if there is no justifiable reason for legal treatment inconsistencies to exist.

## **3. Access to Waterway Issues Related to Non-Motorized Boating**

Access to waterways is a key issue for non-motorized boating. Whereas motorized boaters have a well-defined system of launch ramps and water access, non-motorized boaters generally have not historically had their own dedicated access to waterways, though they can often use the same launch ramps as motorized boaters.

An increase in kayaking in the last ten years has accentuated water access issues and conflicts of waterway uses in California and elsewhere. Non-motorized boater access issues have stressed California private property rights through trespassing violations, and also put some land use pressures on ecologically sensitive areas. In recent years, there has been an effort to try to help manage non-motorized boating better in this State.

### **a. California Laws Focusing on Improving Access to Non-Motorized Boating**

#### ***California Recreational Trails Act***

Under the 1974, California Recreational Trails Act (AB 3594), DBW is authorized to pursue activities which will increase opportunities for recreational boating on designated waterways through the study and identification of recreational resources and potential boating trail routes. DBW is responsible for the Boating Trails Element, of the Recreational Trails Plan, and is authorized to render assistance to governmental agencies to implement the Boating Trails Plan.

### ***San Francisco Bay Area Water Trail Act***

Planning is moving ahead on California's first official water trail, the San Francisco Bay Area Water Trail, created by State law (AB 1296), in 2005. This trail would circle the Bay, with the possibility of more than eighty (80) locations for paddle watercraft launch and retrieval on the Bay.

On, or before, January 1, 2008, the San Francisco Bay Conservation and Development Commission is required to prepare, and submit to the State Legislature, the San Francisco Bay Area Water Trail Plan. This Act designates the State Coastal Conservancy as the lead agency in the funding and development of projects to implement the Plan.

Non-motorized, small boating access onto the Bay is often limited by launch design, and availability of parking and other launch site facilities (e.g., restrooms). For multi-point trips, water trail users need access points that are near to each other, and multi-day trips require overnight accommodations at trail heads. Additional access issues are launch site safety and security, user conflicts, and accessibility for persons with disabilities.

### **b. California Laws Challenging Access to Non-Motorized Boating**

Non-motorized boaters are constantly being challenged by water access issues due to the unstructured and decentralized nature of many non-motorized boating activities. For example, a kayaker may first access a navigable stream or river by crossing through public lands, continue by paddling down the stream or river running through the private lands, and then finally exit

downstream or down river, on public lands. However, if the kayaker exits the stream across someone's private property, they face the risk of a trespass violation.

Similarly, an ocean kayaker may paddle in clearly navigable open ocean waters to the boundary of a State Park, and then try to enter the State Park boundary area, but not through the official entrance to the Park. In this case, the kayaker may face possible sanctions from Park management for entering the State Park at other than the official park entrance designated by the State.

The issue of non-motorized boating access largely concerns waterways that are supposedly "navigable", and hence open to public use. The courts have usually ruled that rivers which are physically navigable are also "navigable" for purposes of State ownership. On such rivers, the riverbed and banks, up to the ordinary high water marks, are usually declared State land, held in trust for public navigation, fishing, and other non-destructive visits.

Over the years, there have been many Federal and California court cases regarding legal rights water use issues. Seeking case-by-case court solutions to this complex legal problem can be costly and contentious. In recent years, some non-motorized boating groups (such as the American Canoe Association and American Whitewater) have rather focused on improving landowner relations, both before, and during, a non-motorized boating event. The National Organization for Rivers (NORS) River Law Project provides clear summaries of the issues surrounding river law in the United States.<sup>115</sup>

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## Section 6 Endnotes

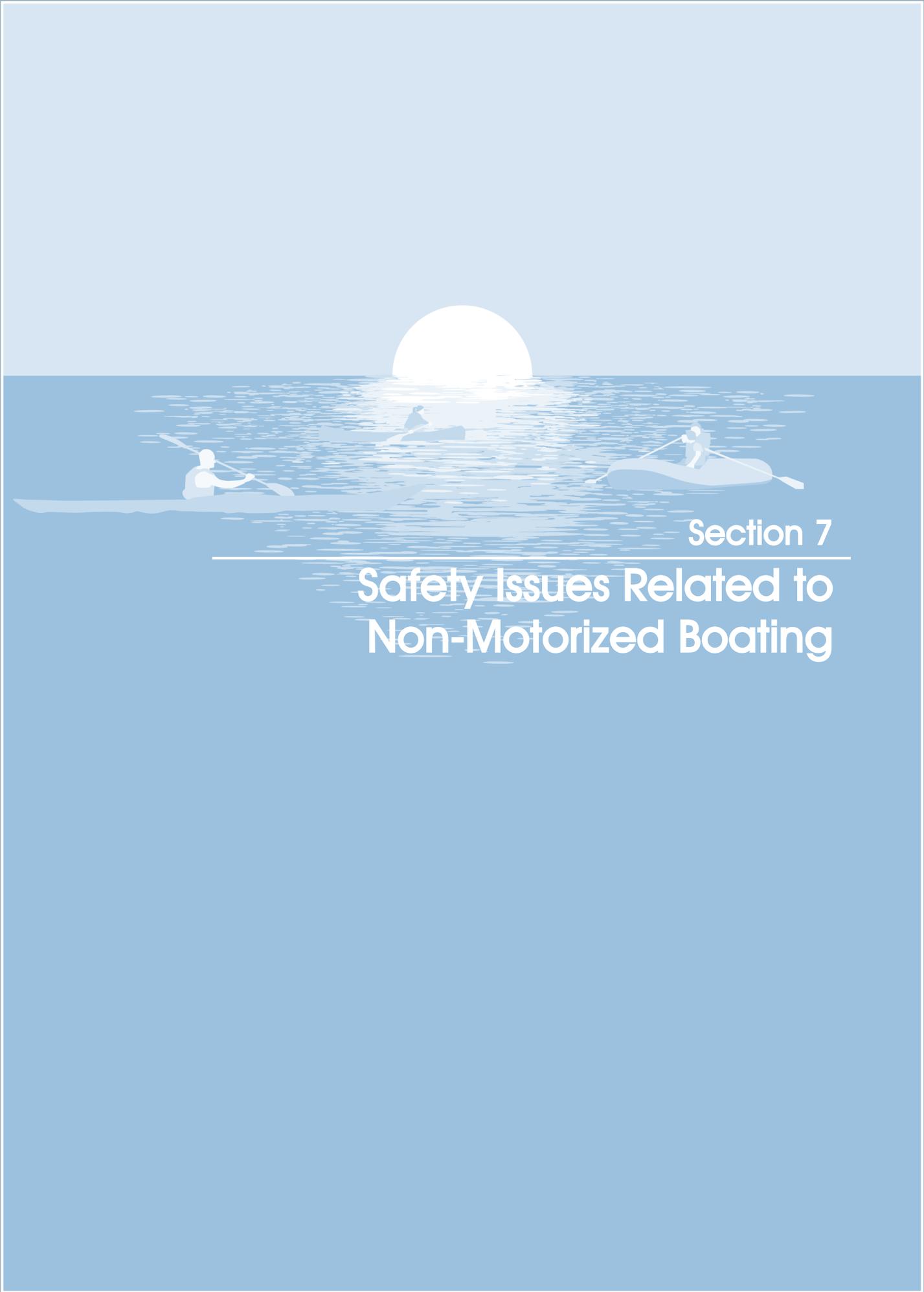
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- <sup>112</sup> California Department of Motor Vehicles, [www.dmv.ca.gov/boatsinfo/boatreg.htm](http://www.dmv.ca.gov/boatsinfo/boatreg.htm).
- <sup>113</sup> United States Coast Guard Navigation Rules at <http://www.navcen.uscg.gov/mwv/navrules/rules/Rule03.htm>.
- <sup>114</sup> “Racing shell, rowing scull, racing canoe, and racing kayak” means a manually-propelled boat that is recognized by national or international racing associations for use in competitive racing and one in which all occupants row, scull, or paddle, with the exception of a coxswain, if one is provided, and is not designed to carry and does not carry any equipment not solely for competitive racing (Section 6565.2, Title 14, California Code of Regulations).
- <sup>115</sup> National Organization for Rivers (NORS), “Public ownership of rivers in the United States,” available at: <http://www.adventuresports.com/river/nors/us-law-public.htm>.



Section 7

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# Safety Issues Related to Non-Motorized Boating

## 7. Safety Issues Related to Non-Motorized Boating

This assessment of non-motorized boating safety in California is based on: (1) a literature review of studies on non-motorized boating safety, (2) United States Coast Guard (USCG) boating safety reports, (3) DBW accident data for non-motorized boats over the last twelve years, (4) interviews with non-motorized boating safety experts and waterway managers, and (5) results of the random, active-user, and commercial surveys.

This section is organized as follows:

- A. Non-Motorized Boating Safety Issues and Concerns*
- B. Statistics and Demographics of Non-Motorized Boating Accidents*
- C. Reasons for Non-Motorized Boating Safety Issues and Accidents*
- D. Implications for Improving Non-Motorized Boating Safety.*

### A. Non-Motorized Boating Safety Issues and Concerns

As participation in non-motorized boating increases, safety is of greater concern. In addition, when there are serious non-motorized boating accidents, they often receive high-level publicity, thus heightening concerns and fear about non-motorized boating safety. When considering activities such as whitewater paddling, non-motorized boating safety issues are often more closely associated with outdoor recreation safety, rather than with boating safety. In other cases, particularly for the casual paddler, safety concerns have many of the same characteristics as those of motorized boating.

Nationally, a significant number of non-motorized boating fatalities occur in one of three situations: (1) relatively inexperienced boaters in canoes or rowboats on flat water, without life jackets, often fishing, (2) relatively inexperienced private rafters, often without life jackets, in conditions beyond their experience level, or (3) highly experienced and well-outfitted paddlers, typically kayakers with life jackets, attempting to paddle in extreme and challenging conditions. The first two types of non-motorized boating fatalities account for more than one-half of non-motorized boating fatalities, with the third type accounting for less than one-half.

Most boating accidents, no matter what type, are a result of a combination of poor judgment and environmental conditions. The judgment component is based, in part, on an individual's perception of risk. The perceived risk associated with an activity may dictate whether a boater wears a life jacket, checks the weather report, or performs other boating safety precautions, all factors that reduce the chance of an accident.

Accident studies in manufacturing, aeronautical, medical, and maritime environments often refer to a "chain of errors" leading to an accident. The concept is that "accidents are

not usually caused by a single failure or mistake, but by the confluence of a whole series, or chain, of errors.”<sup>1</sup> This concept of a progressive series of events, many of which alone would be minor, but cumulatively leading to serious accidents, applies to many non-motorized boating accidents as well. Typically, when human-error is involved (for example an incorrect decision, improperly performed action, or inaction), one poor decision may lead to another, with the final result being calamitous.

There are various theories of risk and risk-seeking activities. Risk homeostasis theory basically states that people subjectively accept a certain level of risk in any activity, and that they maintain a level of risk they are comfortable with.<sup>2</sup> Thus, if they perceive that an activity is riskier, such as paddling in whitewater, they will take action to reduce the risk, such as wearing a life jacket. Each person has their own acceptable level of risk, and for a whitewater kayaking enthusiast, that acceptable level is much higher than for a weekend canoeist. Accidents often result when the perceived level of risk and the actual level of risk are not the same.

There is inherent risk in most outdoor activities, although statistically speaking, often not greater than normal daily life. Studies of outdoor activities often favorably compare the risk of the activity – kayaking, mountain biking, climbing, etc. – with day-to-day activities such as driving a car.

\* \* \* \* \*

The following discussion of non-motorized boating safety issues analyzes statistics and demographics that provide insights into various types of non-motorized boating accidents and safety concerns. This discussion examines the reasons for non-motorized boat accidents, and discusses implications for improving non-motorized boating safety.

## B. Statistics and Demographics of Non-Motorized Boating Accidents

There are a number of data sources and compilations of non-motorized boating accidents. Most motorized and non-motorized boating safety analyses are based, at some point, on accident data from the United States Coast Guard (USCG).

### 1. USCG Accident Data

The USCG requires the operator of any registered vessel, or vessel used for recreational purposes, to file a Boating Accident Report (BAR) when: (1) a person dies; or (2) a person is injured and requires medical treatment beyond first aid; or (3) damage to vessels or property exceeds \$2,000 or there is a complete loss of vessel; or (4) a person disappears from the vessel.<sup>3</sup> The USCG database does not include accidents or vessels from commercial activities (such as commercial guide trips), and does not include many non-fatal accidents, as USCG believes that “only a small fraction of all non-fatal boating accidents occurring in the United States are reported to the Coast Guard, State, or local law enforcement agencies.”<sup>4</sup>

In California, boaters typically report accidents to local law enforcement agencies, who report to the DBW, who in turn submits accident reports to the USCG. The USCG reports accidents by boat type or by state, although not for both together, so there are no USCG California-specific data on non-motorized boating accidents. In addition, USCG boating categories for non-motorized boats are limited to: canoe/kayak (in some cases separated into two categories), inflatables, and rowboats. While these boat types are often used without motors, they may also be used with motors. The USCG data does not distinguish between motorized and non-motorized use. There also is a sail category, which could include small sailboats. There is no USCG category for windsurfing accidents.

**Table 7.1**  
**USCG National Boating Accident Data (2005)**

Category	Number
Total fatalities (all boats)	697
Total injuries (all boats)	3,451
Canoe/kayak fatalities	78
Canoe/kayak injuries	72
Inflatable fatalities	22
Inflatable injuries	31
Rowboat fatalities	39
Rowboat injuries	7

**Table 7.2**  
**USCG National Fatality Data for Canoes and Kayaks (2005)**

Fatalities	Canoes	Kayaks
Drownings	40	24
With life jacket	3	14
Without life jacket	37	10
Percent without life jacket	93%	42%
Other deaths	9	5
<b>Total</b>	<b>49</b>	<b>29</b>

**Table 7.1**, above, provides a summary of 2005 USCG accident data. In 2005, nationwide, there were 697 boating fatalities and 3,451 boating injuries reported to the USCG. A total of 4,969 vessels were involved in reported accidents. Non-motorized vessels (canoes, kayaks, inflatables, and rowboats) appear to have made up a significant portion of the fatalities, accounting for 139 deaths, or 20 percent of the total. Non-fatal accidents for these three non-motorized boat categories also appear to have been drastically underreported. Only 221 non-motorized vessels were involved in accidents, just 4 percent of the total. However, 63 percent of these reported non-motorized boating accidents resulted in fatalities. Clearly, only the most serious non-motorized boating accidents were being reported.

The USCG accident data, shown in **Table 7.2**, left, appear to reflect that boaters participating in perceived low risk activities, such as canoeing, tend not to wear life jackets, and those participating in perceived high risk activities such as kayaking, more often wear life jackets. In 2005, there were more deaths resulting from canoeing, without a life jacket, than from any other type of non-motorized boating.

## 2. DBW Accident Data

The DBW compiles and reviews data for all boating accidents reported in California, including non-motorized boat accidents. This subsection summarizes DBW non-motorized boat accident data from 1995 to 2006. As with the USCG data, these data likely include the majority of actual fatality accidents, and only a small portion of actual injury accidents.

Over the twelve year period, there were 242 reports filed for accidents involving non-motorized boats. The number of separate incidents is just over 200, as one report is filed for each boat involved in an accident. There were 168 accidents involving a single boat, 33 accidents involving two boats, and three accidents involving more than two boats each.

The number of non-motorized boating fatalities for the twelve years between 1995 and 2006 was 95, and the number of injuries was 139.<sup>a</sup> **Table 7.3**, on the next page, summarizes the total number of annual fatalities and injuries since 1995. Based on this accident data and the estimated participation days of non-motorized boating in 2006, the risk of suffering a fatality or injury accident in non-motorized boating is relatively low. In 2006, there were 1.4 fatalities per 10 million participation days of non-motorized boating, and 3.3 reported injuries per 10 million participation days of non-motorized boating. By means of comparison, there were 35 motorized boating fatalities in California in 2006.

<sup>a</sup> In a few cases, more than one injury or death was reported on a single accident report, thus deaths and injuries sum to 234, not the number of accident reports, 242.

**Table 7.3**  
**Non-Motorized Boating Accident Deaths and Injuries in California (1995 to 2006)**

Year	Number of Deaths	Number of Injuries
1. 1995	8	11
2. 1996	8	11
3. 1997	7	16
4. 1998	15	6
5. 1999	7	13
6. 2000	7	6
7. 2001	2	13
8. 2002	5	14
9. 2003	12	17
10. 2004	4	4
11. 2005	13	12
12. 2006	7	16
<b>Total</b>	<b>95</b>	<b>139</b>

**Table 7.4**  
**Type of Non-Motorized Boating Accident in California (1995 to 2006)**

Type of Accident	Number of Reported Accidents
Capsizing	114
Collision with vessel	59
Falls overboard	23
Collision with fixed object	8
Flooding/swamping	8
Fall in boat	8
Struck submerged object	7
Struck by motor/propeller	3
Collision with floating object	1
Fire/explosion	1
Other/unknown	10
<b>Total</b>	<b>242</b>

**Table 7.4**, left, summarizes the type of accident for each of the 242 reported non-motorized incidents. The most frequent types of accidents were capsizing, followed by collisions with vessels and falling overboard.

Over 90 percent of the California fatalities were due to drowning.<sup>b</sup> The most commonly identified activities of fatality victims were: whitewater activities (36 victims); fishing (15 victims); and recreating (15 victims). General paddling activities were identified for the remaining 29 victims. **Table 7.5**, on the next page, identifies the vessel type for non-motorized fatality and injury accidents.

Accidents occurred on all types of waterways, and in all regions of the State. The waterways with the most accidents generally are a reflection of the waterways with the most use, although some waterways, such as the Yuba River and Trinity River, have higher numbers of accidents than would be expected for their use levels. During the twelve years for which data were analyzed, non-motorized boating accidents were reported on 87 different waterways. The ten waterways with the greatest number of reported accidents, are identified in **Table 7.6**, on the next page.

California non-motorized boating accident data generally reflects the non-motorized boating accident trends identified in national studies. Similar to other studies, only one-third of deaths were due to whitewater activities, while the remaining deaths occurred while the victim was fishing, recreating, or generally paddling. This finding again reflects the split between types of non-motorized accidents, with most accidents taking place during perceived low-risk activities such as fishing, and fewer than expected accidents occurring during perceived high-risk activities, such as whitewater boating.

<sup>b</sup> Although not directly related to non-motorized boating, river managers raised concerns about drowning accidents among individuals recreating alongside rivers and waterways. Often these individuals are not aware of river currents. As a result of this issue, the State Coastal Conservancy has funded bilingual safety signage for some locations on the coast and Russian River.

### 3. American Whitewater Accident Data

American Whitewater, a national non-profit organization focused on both conserving whitewater resources and safety, also maintains an accident database.<sup>5</sup> The large majority of accidents reported in the American Whitewater database were fatalities. The American Whitewater database includes accidents that are self-reported by paddlers, and may not necessarily be reported to the State.

There were 92 California accidents in the American Whitewater database, covering the period from May, 1980 to July, 2006. Most of these accidents (79) were fatalities, occurring on over thirty different rivers, a lagoon, and a lake. The rivers with the greatest number of fatalities were the South Fork of the American River (11), the Kern River (10), and the Tuolumne River (9).

A more detailed analysis of the 29 accidents occurring since 2000, found 27 fatalities and 2 near drownings. Thirteen accidents involved rafts, and eleven involved kayaks (including inflatable and sit-on-tops). Three of the thirteen raft accidents involved commercial trips, with the remaining ten private. When the experience level of the boater was known, it was almost evenly split between experienced (12) and inexperienced (14) boaters.

Accidents since 2000 were spread evenly between twenty rivers and one lake; however, Cache Creek had three fatalities, as did the Tuolumne River. The types of accidents at these two waterbodies reflected the differences in non-motorized boating accidents.

One set of accidents involved private rafters, often inexperienced, and in a few cases without life jackets. Another set of accidents involved experienced boaters, typically kayakers, trapped in sieves, strainers, undercuts, or tree pins. In most cases, rescue attempts were unsuccessful, and in one case, the rescuer drowned.

**Table 7.5**  
Number of Non-Motorized Boating Death and Injury Accidents by Vessel Type in California (1995 to 2006)

Vessel Type	Number of Deaths	Number of Injuries
Canoe/kayak	47	69
Raft	32	35
Rowboat	9	14
Sailboard	3	10
Kiteboard	1	1
Small sailboat	1	1
Paddle boat	1	5
Amphibious Tricycle	1	0
Inflatable dinghy	0	1
Rowing scull	0	3
<b>Total</b>	<b>95</b>	<b>139</b>

**Table 7.6**  
Top Ten Waterways for Non-Motorized Boating Accidents in California (1995 to 2006)

Waterway	Region	Number of Accidents
1. Pacific Ocean	NC, SF, CC, SC, SD	32
2. American River	SB	18
3. Trinity River	SB, NC	11
4. Lake Tahoe	SB	10
5. Yuba River	SB	10
6. Lake Isabella	CV	8
7. San Francisco Bay	SF	8
8. Sacramento River	SB	8
9. Russian River	NC	7
10. Kern River	CV	6

In addition to the accident database, American Whitewater prepares a National Accident Study, the most recent of which was published in 2006.<sup>6</sup> The study analyzed USCG and American Whitewater accident data from 1995 through 1998, but also included fatality trends from previous reports, going back to 1977. Between 1977 and 1998, the number of “non-motorized human powered boating” fatalities nationally ranged from 83 to 163 per year. Nationally, American Whitewater found that accidents in flatwater were slightly more common than accidents in whitewater, with only a small percentage (less than 10 percent) of accidents occurring in the ocean.

The majority of accidents involved either canoes or whitewater kayaks, with fewer rafting accidents, and even fewer sea kayaking accidents. Most canoe accidents were in flatwater, and most victims were not wearing life jackets. Sea kayakers had far fewer accidents, mostly resulting from bad weather or sudden, unexpected weather changes. Whitewater kayaking accidents (as well as whitewater rafting accidents) were most often caused by river and water conditions such as strainers, sieves, and being caught and held in hydraulics.

### 4. American Canoe Association Accident Analysis

In 2004, the American Canoe Association (ACA), the oldest recreation-based waterway conservation organization in the country, published a report, *Critical Judgment II Understanding and Preventing Canoe and Kayak Fatalities 1996-2002*.<sup>7</sup> The ACA’s report also utilized USCG boating accident data for canoes and kayaks. The purpose of the report was to improve knowledge about canoe and kayak fatalities in order to more effectively reduce the risk of these activities. The ACA analysis of USCG data supports that of other organizations in identifying fatality characteristics.

Over the seven years of the ACA’s analysis, 76 percent of canoe and kayak fatalities involved capsizing, with capsizing probability about the same between canoes and kayaks, and as likely on calm water as on choppy or rough water. Hazardous water or weather was more likely to be a cause of kayak fatalities (46 percent of the total), than canoe fatalities (20 percent). Alcohol was more often a factor in canoe fatalities (25 percent), than kayak fatalities (9 percent). Alcohol use was a greater problem in calm water, as was a lack of life jackets. The ACA analysis found that about 90 percent of canoe and kayak fatalities were males, and about 50 percent of victims were fishing at the time of the accident. Most canoe accidents involved aluminum and/or inexpensive canoe brands.

### 5. Safety Concerns from Random, Active-User, and Commercial Surveys

Two-thirds of the statewide random survey respondents indicated that they had safety concerns related to non-motorized boating. Respondents were asked to identify those concerns, from a list of options. Respondents could identify as many concerns as they chose. **Table 7.7**, on the next page, summarizes the safety concerns of statewide random survey respondents. **Table 7.8**, on the next page, summarizes the safety concerns of active-user survey respondents.

The safety issues raised by survey respondents reflect those issues that non-motorized boaters are concerned about. These are not necessarily the same problems, or concerns, that result in injury and fatality accidents. For example, non-motorized boaters were most concerned about interactions with motorized boaters. This is a valid safety concern; however, interactions with motorized boaters were not the primary cause of non-motorized boating accidents.

The active-user survey respondents had more safety concerns than the statewide random survey respondents, which is expected given that this group is on the water more frequently. For both groups, interactions with motorized vessels was the greatest concern, with one-third of statewide random boaters, and two-thirds of active-user boaters, identifying this issue.

Inexperienced or unprepared boaters was the second-most mentioned safety concern for both survey groups. After these two safety concerns, the two survey groups diverge. The statewide random survey respondents were also concerned, in order, about boaters not using life jackets, unsafe water conditions, and water quality. The active-user survey respondents were more concerned about water quality, overcrowding, and unsafe water conditions. The active-user survey respondents identified several additional safety concerns that reflect their more frequent use of more remote waterways, such as vandalism of parked cars, hostile landowners, and dangerous access to water. Both kiteboarders and others expressed the need for safe launching and kiting areas for this new activity.

Approximately two-thirds of commercial and institutional survey respondents identified safety concerns. **Table 7.9**, on the next page, summarizes the safety concerns of commercial and institutional operators.

For commercial and institutional respondents, the key safety issue was inexperienced boaters. Most respondents noted that they were concerned about inexperienced private boaters that they see on the waterways, as opposed to inexperienced commercial operations, although a few respondents mentioned the latter concern as well.

**Table 7.7**  
**Safety Concerns of Statewide Random Survey Respondents, Percent of Respondents with Concerns (2006) (n=193, with 294 total responses)**

Safety Concern	Percent of Respondents with Concern*
Interactions with motorized vessels	35%
Inexperienced or unprepared boaters	25%
Boaters not using life jackets	18%
Boating in unsafe water conditions	17%
Waterborne illness/poor water quality	15%
Problems related to overcrowding	13%
Using unsafe boats or equipment	12%
Boating in unsafe weather conditions	9%
Boaters using alcohol	3%
Hunters near boating areas	1%
Other	4%

\* Sums to greater than 100% due to multiple answers per respondent.

**Table 7-8**  
**Safety Concerns of Active-User Survey Respondents, Percent of Respondents with Concerns (2006) (n=1,171, with 3,627 total responses)**

Safety Concern	Percent of Respondents with Concern*
Interactions with motorized vessels	67%
Inexperienced or unprepared boaters	61%
Boaters not using life jackets	22%
Boating in unsafe water conditions	32%
Waterborne illness/poor water quality	50%
Problems related to overcrowding	33%
Using unsafe boats or equipment	16%
Boating in unsafe weather conditions	22%
Boaters using alcohol	1%
Hunters near boating areas	<1%
Marine life	1%
Need for safe kitelaunching and kiteboarding areas	1%
Vandalism and security at parking areas	1%
Hostile landowners	1%
Need for better/faster rescue support	1%
Interactions with sailboats or surfers	<1%
Not observing channel traffic, or poorly marked harbor channels	<1%
Dangerous access to water	<1%
Other	1%

\* Sums to greater than 100% due to multiple answers per respondent.

**Table 7.9**  
**Safety Concerns of Commercial/Institutional Survey Respondents, Percent of Respondents with Concerns (2006) (n=72, with 249 total responses)**

Safety Concern	Percent of Respondents with Concern*
Interactions with motorized vessels	46%
Inexperienced or unprepared boaters	75%
Boaters not using life jackets	38%
Boating in unsafe water conditions	49%
Waterborne illness/poor water quality	29%
Problems related to overcrowding	26%
Using unsafe boats or equipment	31%
Boating in unsafe weather conditions	32%
Boaters using alcohol	6%
Dangerous access to water	8%
Lack of enforcement of boating laws	3%
Other	4%

\* Sums to greater than 100% due to multiple answers per respondent.

There was growing concern among commercial outfitters that as it becomes easier and cheaper to own a non-motorized boat, uneducated novice boaters are placing themselves in harm’s way. Any increase in non-motorized boating accidents deters the general public from participating in the activity, even when accidents are a result of new boater negligence.

Almost one-half of commercial respondents also identified boating in unsafe water conditions, and interactions with motor boats, as safety concerns. Several commercial respondents noted that certain access locations and trails to the water are dangerous, sometimes resulting in injuries to guides and/or customers.

## 6. Studies of Non-Fatal, Non-Motorized Boating Accidents and Injuries

Fatal accidents are the most significant and problematic non-motorized boating safety concern. However, there are other safety issues that have been addressed in the literature, ranging from acute injuries, to chronic overuse injuries, to waterborne illness. Accidents and overuse injuries are typically specific to the sport, while waterborne illness may be an occupational hazard of water-based activities.

### *Waterborne Illness and Non-Motorized Boating*

Several studies have examined waterborne illness among participants in water sports. Fewtrell et al., examined health effects from marathon canoeing and rowing in varying water qualities, and found that “health effects of low-contact water sports are minimal, within the water quality ranges which were studied.”<sup>8</sup> Several studies have examined illness among windsurfers due to polluted water. However, a paper and Internet survey of 294 windsurfers completed in 1997 did not discuss the topic.<sup>9</sup> In a year 2000 survey of 319 whitewater kayakers and canoeists, 14.5 percent reported giardia infections, compared to only 4 percent for the U.S. population overall,<sup>10</sup> and other studies of kayak and rafting injuries have found similar infection rates.<sup>11</sup>

Over one-third (37 percent) of all active-user survey respondents identified poor water quality as a concern. The concern was greatest among respondents in Southern California, and a number of respondents commented that they have gotten ill from water contact after boating on certain waterways. Fewer commercial survey respondents (19 percent) and statewide random survey respondents (8 percent) identified water quality as a concern.

Whether or not a respondent identifies water quality as a concern depends in large part on where they participate in boating. Water quality

was a significant concern among many boaters using the Long Beach area (Mother's Beach, Naples, Alamitos Bay), Marina del Rey, the Oakland Estuary, and the Klamath River.

### *Acute and Chronic Injuries*

Acute and chronic injuries are often unique to a particular non-motorized boating activity. The four areas that have been most studied and documented are whitewater canoeing, rafting, kayaking, and windsurfing.

One study of whitewater injuries identified four injury categories: (1) trauma from striking an object in the river or equipment; (2) trauma resulting from the paddlers' positioning or equipment and the force of the water; (3) overuse injuries; and (4) submersion and environmental injuries.<sup>12</sup> Acute kayak injuries typically included shoulder dislocations and other upper-body injuries, and injuries to the face, head, and neck. Acute rafting injuries were more often the result of being struck by a paddle, or striking an object after being thrown from the raft. Canoeists were more likely to suffer acute injuries to the knee or leg.<sup>13</sup> Chronic injuries were common among kayakers, mostly involving the shoulder or wrists. Canoeists suffer chronic injuries from the elbow or forearm. Studies have not evaluated chronic injuries of rafting guides.

An on-site and Internet survey of about 300 windsurfers conducted in the late 1990s, found that direct injury from the windsurfing apparatus resulted in 65 percent of acute injuries.<sup>14</sup> Most of these injuries were caused by the boom, footstrap, or mast. Most acute windsurfing injuries occurred when jumping or in high-speed falls. The most common acute injuries, mostly to the lower extremities, consisted of sprains, lacerations, contusions, and fractures. About one-half of the respondents reported chronic injuries, predominantly lower-back pain, neck pain, and tendonitis of the elbow.

**Table 7.10**  
**Reasons for Non-Motorized Boating Safety Problems and Accidents**

#### *Natural or Environmental Factors*

- Weather conditions (winds, changing weather patterns, rain, lightning)
- Water conditions (temperature, hydraulics, high flow rates, rapids, low-head dams, surf)
- Obstacles (rocks, strainers, sieves, logs)

#### *Boater-Related Factors*

- Lack of adequate skills
- Lack of adequate equipment (inadequate boat, no life jacket)
- Lack of adequate information (related to weather and/or water conditions)
- Lack of knowledge (related to boating, equipment)
- Poor judgment
- Inattention
- Contact with equipment (ropes, paddles, boom, board)
- Chronic injuries

## **C. Reasons for Non-Motorized Boating Safety Issues and Accidents**

Non-motorized boating safety problems and accidents are typically the combined result of boater's actions or judgment, and natural or environmental factors. For example, a whitewater kayaker that is not aware of current high flows may be more likely to encounter rapids that are too difficult for their skill level, and become trapped or capsize in fast-moving and cold water. **Table 7.10**, above, summarizes common natural and boater-related safety factors.

**Table 7.11**  
**Life Jacket Wear Rates for Non-Motorized Boating Types (2005)**

Boat Type	Adults, Percentage Wearing Life Jacket	Youths, Percentage Wearing Life Jacket
Kayak	74%	89%
Rowboat/Dinghy	59%	77%
Sailboard	53%*	100%
Inflatable/Raft	44%	67%
Canoe	15%	69%

\* This 53 percent figure appears high based on anecdotal observations in California. The figure is based on twenty (20) observations in the USCG life jacket wear rate study.

The ACA identified several unique factors typically associated with non-motorized boating that can increase the risk of these activities:

- The size and shape of canoes and kayaks make them unstable, and more prone to capsizing, particularly in choppy waves or surf.
- Many novice boaters appear to “not take the craft seriously”, having little or no safety skills and not wearing a life jacket.
- Because the craft are small and hand-powered, they are susceptible to weather conditions, indicating a need to check weather and water conditions before boating, and wear proper clothing.
- Whitewater paddlers must be knowledgeable about, and able to maneuver, hazardous conditions such as low-head dams and strainers.
- Coastal paddlers must be knowledgeable about surf conditions and hazards.
- For those paddling in remote locations, it may be difficult to obtain help in the case of an emergency, thus reducing the margin for error.

The comments of paddling representatives in a USCG sponsored discussion related to requiring spousons (stability/flotation devices) in canoes illustrate several perspectives on non-motorized

boating safety and a consensus that regulation is not the answer. One organization representative stated that there was an “innocent canoeist problem” and that education was more appropriate than regulation.<sup>15</sup> Another pointed out that “good judgment could not be replaced with regulation.”<sup>16</sup> Another respondent in the dialog thought that skilled paddler fatalities were “purely due to overconfidence”, and thus regulations would not prevent them. As the director of a canoeing center said, “a large portion of the enjoyment value of the sport comes from matching personal skills with the performance possibility of the various craft.”<sup>17</sup>

### Non-Motorized Boats and Life Jackets

Use of life jackets is an ongoing boating safety issue, and one that has been extensively studied by the USCG. The USCG conducts an annual observational survey of life jacket wear rates for all boat types.<sup>18</sup> For the last eight years, the USCG has made observations on over 115,000 boats and 300,000 boaters in thirty states, averaging four sites per state (eight in California). About 10 percent of the boats observed each year are in the “other” category, which includes canoes, kayaks, rafts, and sailboards. The overall life jacket wear rate for all ages and boats was 23 percent in 2005.

For adults, kayaks had the highest life jacket wear rate, 74 percent, although this rate was lower than in previous years, when it has been in the mid-80 percent range. In 2005, canoe life jacket wear rates for adults were extremely low, at 15 percent. Life jacket wear rates for youths under 18 in canoes were much higher, 69 percent. Wear rates for youths were higher than for adults in all boat categories.

**Table 7.11**, above, summarizes life jacket wear rates for non-motorized vessels. The USCG study analyzed a number of factors related to life jacket wear rates, and concluded that the adult life jacket wear rate is the “product of an assessment of risk of falling

**Table 7.12**  
**Boat Operators and Life Jacket Habits in California (2002)**

Boat Type	Carried enough life jackets for all on board	Carried at least one life jacket	Did not carry a life jacket	“Always” wear a life jacket	“Most of the time” wear a life jacket	“Sometimes” wear a life jacket	“Rarely” wear a life jacket	“Never” wear a life jacket
Canoe	96.8%	3.2%	0.0%	65.6%	3.1%	0.0%	9.4%	21.9%
Kayak	98.4	1.6	0.0	72.3	9.2	6.2	9.2	3.1
Inflatable	73.7	15.8	10.5	38.1	0.0	9.5	4.8	47.6
Rowboat	93.3	6.7	0.0	40.0	33.3	0.0	6.7	20.0
Sailboat (sail only)	91.7	0.0	8.3	36.4	0.0	27.3	0.0	36.4

overboard, or capsizing, plus an assessment of the seriousness of the consequences of falling overboard, or capsizing.”<sup>19</sup> Thus, whitewater kayakers realize the risk of the activity, and almost universally wear life jackets, while a canoeist on a calm lake is less likely to wear a life jacket. However, as the accident data shows, the canoeist is more likely to suffer a fatal accident.

The 2002 *National Recreational Boating Survey*, also conducted for the USCG, interviewed over 25,000 registered and unregistered boat owners, including almost 500 in California. This study asked about life jacket use for several boat types. The results, summarized above in **Table 7.12**, indicate that canoes and kayaks have high life jacket wear rates, while the other three boat types all have relatively low life jacket wear rates. In general, even these low life jacket wear rates are higher than life jacket wear rates for motorized boats.

## D. Implications for Improving Non-Motorized Boating Safety

Boaters cannot change weather and water conditions; however, boaters can avoid many accidents by changing their own behavior and how they respond to challenging natural conditions.

The American Whitewater study found that many deaths were preventable by taking one or more of the

following simple precautions: (1) wearing life jackets, (2) better assessing water conditions, or (3) using proper (warm/water proof) clothing.

Both American Whitewater and the American Canoe Association had similar recommendations related to improving non-motorized boating safety. These were essentially to: (1) provide better reporting of accidents; (2) improve coordination and communication between paddling interest groups and government agencies; and (3) increase education efforts.

American Whitewater’s recommendations included: (1) working with the USCG to improve detail reporting and accident descriptions to obtain better information related to paddling and using whitewater class rates,<sup>20</sup> or at least “no current”, “fast current”, or “whitewater rapids”; (2) strengthening partnerships between organizations interested in paddling safety, such as American Whitewater, American Canoe Association, USCG, paddling equipment manufacturers, local clubs, states, etc.; and (3) developing safety programs aimed at three distinct target audiences: expert kayakers, recreational kayakers and rafters, and casual canoeists.

The ACA noted a gap in paddling safety education, after the American Red Cross dropped their paddling safety programs ten years ago, coincident with an almost exponential growth in

paddling popularity. The ACA also noted that reducing paddling fatalities will require coordination and commitment by many organizations. The ACA, with others, is developing a *Paddlesports and Safety Awareness National Plan of Action*. The ACA noted a need to target particular populations of boaters, for example, infrequent or casual paddlers (the fishing canoeists not wearing life jackets).

The ACA strategy recommends: (1) improved accident reporting; (2) adequate funding for increasing knowledge about paddlesport safety issues among State boating officials, accident investigators, and boating safety educators; (3) funding for development and testing of new safety messages aimed at the target groups; and (4) funding for signage and other efforts to inform boaters about public hazards (low head dams, high water levels).

The ACA also noted that many canoe accidents occur when boaters stand up or move around in the boats, a problem that can be addressed by education. Safety education is an important component of the ACA's strategy.

This type of education effort is important, and it should be geared toward specific target groups. The USCG has been tracking life jacket wear rates for all boating activities for eight years. During this time, there have been extensive campaigns related to wearing life jackets. Life jacket wear rates for children and youths have increased during this time. There has been essentially no change in life jacket wear rates in adults.

The ACA suggests that education and marketing efforts to increase life jacket wear rates could be modeled after successful anti-smoking and seatbelt campaigns. The DBW has a number of different boating education campaigns and coordinates with national safety campaigns as well. Many of these efforts are directed at motorized boating.

California river managers identified several safety recommendations related to whitewater river use. There was widespread interest in more, and better, education of boaters. A recurring comment was educating inexperienced boaters about water and rapid conditions. Recommendations included more and better use of signs, as well as stationing river patrols on-site at put-ins to educate boaters. Use of appropriate life jackets was also a concern, as some novice private boaters use waterski vests, or other inappropriate life jackets that do not provide adequate protection for whitewater boating.

Most whitewater rivers have river patrols during the busy summer months, although in many cases there is not enough staffing to fully cover a river. River patrols can provide more rapid response in emergencies, as well as educate boaters and enforce requirements along the river to help prevent accidents.

Addressing non-motorized boating safety among experienced whitewater boaters will take a different approach than reaching the casual weekend canoeist. For this experienced group, promoting swiftwater rescue courses (a requirement for many commercial guides) and other advanced skill classes would be beneficial.

Even on non-whitewater rivers, such as the Russian River, proper signage is needed for portaging locations. Paddlers may place themselves in unsafe situations if they are unaware of the need to portage, or of which side of the river they must be on in order to portage. Paddlers also need to be made aware of restricted areas, such as swimming spots, so they can be safely avoided.

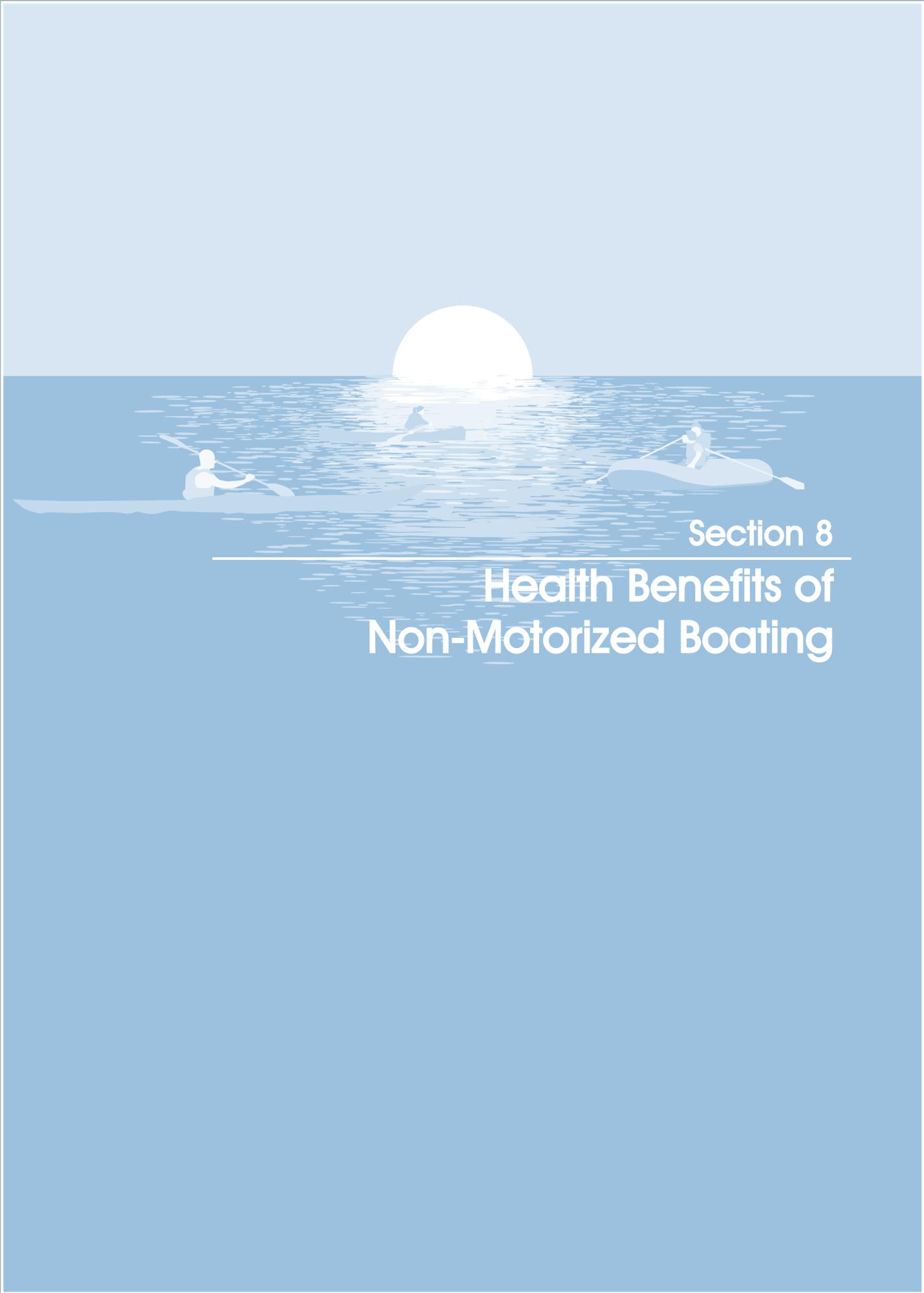
As the number of non-motorized boaters grows, so does the need to educate novice boaters about the safety requirements of their new activity. At the same time, many non-motorized boaters expressed a need for increased education and enforcement of motorized boaters.

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## Section 7 Endnotes

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- <sup>1</sup> Dr. Anita M. Rothblum, "Human Error and Marine Safety," U.S. Coast Guard Research & Development Center, available at: [http://www.uscg.mil/hq/gm/risk/E-Guidelines/RBDM/html/vol4/Volume4/Gen\\_Rec/HumanErr.htm](http://www.uscg.mil/hq/gm/risk/E-Guidelines/RBDM/html/vol4/Volume4/Gen_Rec/HumanErr.htm)
- <sup>2</sup> Potomac Management Group, *The Efficacy of Sponsons on Canoes and Kayaks* (Washington DC: Prepared for USCG, Office of Boating Safety, July 2004).
- <sup>3</sup> USCG, *Boating Statistics 2005* (Washington DC: USCG, August 31, 2006).
- <sup>4</sup> *Ibid.*, 2.
- <sup>5</sup> American Whitewater, [www.americanwhitewater.org/content/accident/view](http://www.americanwhitewater.org/content/accident/view).
- <sup>6</sup> Jennifer L. Plyler, Ph.D. American Whitewater's National Accident Study (Cullowhee, North Carolina: American Whitewater, February 6, 2006).
- <sup>7</sup> Alison Snow-Jones, Ph.D., and others. *Critical Judgment II Understanding and Preventing Canoe and Kayak Fatalities 1996-2002* (Springfield, Virginia: American Canoe Association (ACA), 2004).
- <sup>8</sup> L. Fewtrell et al., "The health effects of low-contact water activities in fresh and estuarine waters." *Journal Inst. Water Environ. Management* 8 (1994): 97-101.
- <sup>9</sup> Christopher Van Tilburg, MD, "Editorial: WWW: wilderness, windsurfing, and the web." *Wilderness and Environmental Medicine* 10 (1999): 216-217.
- <sup>10</sup> Richard G. Schoen, MD, and Micael J. Stano, MSPT, CSCS. "Year 2000 whitewater injury survey." *Wilderness and Environmental Medicine* 13 (2002): 119-124.
- <sup>11</sup> David C. Fiore, MD, "Injuries associated with whitewater rafting and kayaking." *Wilderness and Environmental Medicine* 14 (2003): 255-260.
- <sup>12</sup> Fiore, 2003.
- <sup>13</sup> Schoen and Stano, 2002.
- <sup>14</sup> Andrew T. Nathanson, M.D., FACEP, and Steven E. Reinert, M.S.. "Windsurfing injuries: results of a paper- and Internet-based survey." *Wilderness and Environmental Medicine* 10 (1999): 218-225.
- <sup>15</sup> Potomac Management Group, *The Efficacy of Sponsons on Canoes and Kayaks* (Washington DC: Prepared for USCG, Office of Boating Safety, July 2004).
- <sup>16</sup> Potomac Management Group, 2004, 5.
- <sup>17</sup> Potomac Management Group, 2004, 2.
- <sup>18</sup> Thomas W. Mangione, et al., National PFD Wear Rate Observational Study, 2005 (Boston, Massachusetts: JSI Research & Training Institute, Inc. for USCG, 2006). [Note: USCG now uses the term "life jacket" instead of PFD (personal flotation device)]
- <sup>19</sup> *Ibid.*, 40.
- <sup>20</sup> American Whitewater's International Scale of River Rafting Difficulty provides a six-class system of ranking rivers. The particular ranking of a river can vary based on water flows, and temperatures:
  - Class I is a river with moving water with few riffles and small waves, and no or few obstructions.
  - Class II is a river with easy rapids, waves up to three feet, and wide clear channels.
  - Class III has rapids with high, irregular waves, narrow passages, may require scouting, and requires some experience.
  - Class IV rivers include long, difficult rapids and constricted passages, precise maneuvering, scouting, and requires the boater have the ability to roll a canoe or kayak.
  - Class V rivers are extremely difficult, with long, violent, and congested rapids requiring scouting, and with difficult rescue conditions.
  - Class VI rapids are nearly impossible and very dangerous, for experts only.



Section 8

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# Health Benefits of Non-Motorized Boating

## 8. Health Benefits of Non-Motorized Boating

This section summarizes the health effects of non-motorized boating. The information in this section draws on general research on the health benefits of physical activity and outdoor recreation, of which non-motorized boating is a subset. In addition, this section summarizes the energy output from a variety of non-motorized boating activities. Linking back to the primary data gathered for this study, this section also identifies the reasons why survey respondents participate in non-motorized boating.

This section is organized as follows:

- A. *Health Benefits of Physical Activity*
- B. *Health Benefits of Outdoor Recreation*
- C. *Physical Activity Levels of Non-Motorized Boating*
- D. *Reasons for Participating in Non-Motorized Boating.*

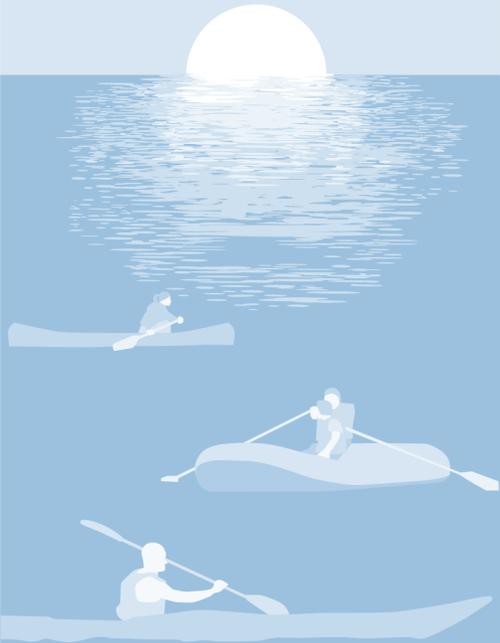
### A. Health Benefits of Physical Activity

There is a large accumulating body of research documenting the health benefits of physical activity.<sup>1</sup> The Surgeon General recommends that adults participate in at least 30 minutes of moderate physical activity most days of the week.<sup>2</sup> Physical activity is defined as “any bodily movement produced by skeletal muscles that results in energy expenditure.”<sup>3</sup>

The majority of adults do not meet this recommendation, and the increase in physical inactivity in the United States is cited as a cause in the increasing prevalence of overweight and obese individuals in this country.<sup>4</sup> Nationwide, over sixty percent of adults are overweight or obese.<sup>5</sup> In 2002, 19 percent of Californians were considered obese, compared to 10 percent in 1990.<sup>6</sup>

Physical inactivity is a problem among all ages, but is of greatest concern for children and teenagers. A recent study found that in 2004, 28 percent of 10 to 15 year olds in California were overweight, and childhood obesity is leading to earlier onset of Type II diabetes.<sup>7</sup>

The negative health impacts of inactivity have economic repercussions as well. A report prepared for the California Department of Health Services estimated that in 2000, the direct and indirect costs of physical inactivity, obesity, and overweight in California were \$21.7 billion annually. This \$21.7 billion figure includes costs of medical care, worker’s compensation, and lost productivity.<sup>8</sup> Over one-half of this total cost was due to physical inactivity.<sup>9</sup>



In 2005, California State Parks produced a report as part of the California Outdoor Recreation Planning Program, *The Health and Social Benefits of Recreation*.<sup>10</sup> This report summarized the physical and mental health benefits of physical activity, and emphasized the importance of these benefits given the severe health problems that California faces, including obesity, diabetes, and cardiovascular disease. Moderate levels of physical activity have been linked to the following nine major categories of health benefits<sup>11</sup>:

- Reducing obesity and controlling weight
- Controlling high blood pressure
- Reducing risk of heart disease and heart attack
- Reducing risk of Type II diabetes
- Reducing risk of colon cancer and breast cancer
- Reducing arthritis pain and disability
- Preventing osteoporosis
- Increasing life expectancy
- Reducing symptoms of depression and anxiety.

Recent studies are also finding that physical activity can help brain functions, and stave off the onset of Alzheimer's Disease and other cognitive disorders.<sup>12</sup>

The physical and health benefits of physical activity result from only moderate levels of physical activity. Studies have found that walking, or even undertaking household activities, for the recommended thirty (30) minutes per day results in health benefits.<sup>13</sup>

### B. Health Benefits of Outdoor Recreation

Outdoor recreation is a subset of physical activity. One key to encouraging participation in physical activity is to make it fun; outdoor recreation, including non-motorized boating, can

do so. Many would argue that there are also additional psychic benefits from spending active time out-of-doors. As far back as the early 1900s, conservationist John Muir noted, "Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountains is going home; that wilderness is a necessity."<sup>14</sup> Muir commented on what many have found themselves, and over 100 studies have documented,<sup>15</sup> that outdoor recreation reduces stress and improves quality of life.

Those that participate in outdoor recreation are more satisfied with their quality of life than those that do not participate in outdoor recreation.<sup>16</sup> While the social benefits of recreation are not as well studied as the physical benefits, there is growing recognition that parks and recreation opportunities strengthen communities, and provide positive alternatives to at-risk youth and senior citizens.<sup>17</sup>

The general trend in the country towards physical inactivity is also reflected in a decline in participation in outdoor activities among California youths. A survey of 605 California parents regarding summer youth activity for the Pacific Forest and Watershed Lands Stewardship Council found that 60 percent of parents said their children's interest in the outdoors is declining.<sup>18</sup> One of the goals of the California State Parks report on recreation's health and social benefits was to provide park and recreation service providers and policymakers with a tool to help generate support for their programs that would counter this trend toward physical inactivity.

### C. Physical Activity Levels of Non-Motorized Boating

The level of physical activity provided by the many types of non-motorized boating ranges from moderate to intense. Epidemiology and kinesiology researchers have developed a standard

**Table 8.1**  
**Comparative Metabolic Equivalent (MET) Values**  
**for Selected Activities<sup>19</sup>**

Activity	MET Value
1. Sitting quietly	1.0
2. Walking, moderate pace (3 mph)	3.5
3. Jogging (> 12 minute mile)	7.0
4. Running (9-minute mile)	11.0
5. Bicycling (general, leisure)	4.0
6. Swimming (laps, slow to moderate)	8.0
1. Canoeing or rowing (light effort)	3.5
2. Canoeing or rowing (moderate effort)	7.0
3. Canoeing or rowing (vigorous effort)	12.0
4. Kayaking	5.0
5. Sailing (boats and sailboards)	3.0

classification of the energy costs of human activities founded on the resting metabolic rate (the amount of energy one expends sitting quietly). This standardized system is based on METs (metabolic equivalent), the ratio of work metabolic rate to resting metabolic rate.<sup>20</sup>

The MET physical activity classification system allows researchers to compare the relative level of physical activity among a wide variety of activities. A MET value of 3.0 for a particular activity, such as light effort canoeing, means that it requires three (3) times more energy expenditure for light effort canoeing than the amount of energy expenditure required to simply sit quietly.

One can extrapolate the general health benefits associated from a given amount of physical activity from one activity, such as walking, to another activity, such as non-motorized boating, based on the METs.<sup>21</sup> Moderate physical activity is defined as an activity performed at an intensity of between 3 and 6 METs.<sup>22</sup>

**Table 8.1**, above, provides the MET values for six common activities, and five non-motorized

boating activities. The table illustrates that paddling activities have similar levels of exertion to common forms of exercise such as walking, running, and bicycling. To put the range of MET values in perspective, the lowest MET value in the Compendium was for sleeping, at 0.9; and the highest MET value in the Compendium was for fast running (5:30 per mile pace), at 18.<sup>23</sup>

Using METs as a means of comparison shows that even light effort paddling is equivalent to walking, the most basic form of moderate physical activity recommended by the Surgeon General and others. This comparison is supported by a study of the physiological effects of recreational kayaking, which found that recreational kayaking produces positive physiological benefits, including a sustained increase in heart rate.<sup>24</sup> This study found that “recreational kayaking is an acceptable form of physical activity to replace more traditional forms of exercise.”<sup>25</sup>

While the more common types of paddling activities provide a moderate level of physical activity, some non-motorized boating activities are more vigorous. Rowing in sculls or shells is considered one of the best full-body workouts available.<sup>26</sup> Competitive rowers of all ages achieve a high level of fitness through non-motorized boating. Similarly, there are a number of other competitive non-motorized boating activities, such as kayak racing, surfski racing, sailboard racing, and outrigger canoe racing, which require a high level of fitness.

## D. Reasons for Participating in Non-Motorized Boating

Non-motorized boaters in California responding to both the statewide random telephone survey, and active-user Internet survey, were asked to identify the reasons why they

participated in non-motorized boating. Respondents were allowed to list multiple reasons for participating in non-motorized boating, and most respondents identified at least three reasons.

**Table 8.2**, right, identifies the top ten reasons for participating in non-motorized boating for the statewide random telephone survey respondents.

**Table 8.3**, right, identifies the top ten reasons for participating in non-motorized boating for the active-user Internet survey respondents. In both tables, the percentages sum to over 100 percent because of multiple responses. The most frequently identified reasons for participating in non-motorized boating, for both surveys, supports the notion that non-motorized boating, as a form of recreation, can provide physical and mental health benefits to participants.

A very significant 24 percent of non-motorized boaters in the statewide random survey participated in non-motorized boating for fitness. Among active-user survey respondents, an even higher 81 percent participated in non-motorized boating for fitness. Clearly, non-motorized boating is an important source of physical activity and fitness for a large number of participants.

**Table 8.2**  
Reasons for Participating in Non-Motorized Boating, Statewide Random Telephone Survey (2006) (n=288)

Reason for Participating	Percent of Respondents
1. For recreation	46%
2. For leisure and relaxation	40%
3. To enjoy nature	38%
<b>4. For fitness</b>	<b>24%</b>
5. To participate in another activity*	24%
6. As a family activity	23%
7. For the physical and/or mental challenge	14%
8. As a social activity	11%
9. Because it is convenient and easy	11%
10. Because it is non-polluting (no gasoline)	10%

\* Fishing, hunting, scuba diving, snorkeling, photography, camping, bird-watching, etc.

**Table 8.3**  
Reasons for Participating in Non-Motorized Boating, Active-User Internet Survey (2006) (n=1,518)

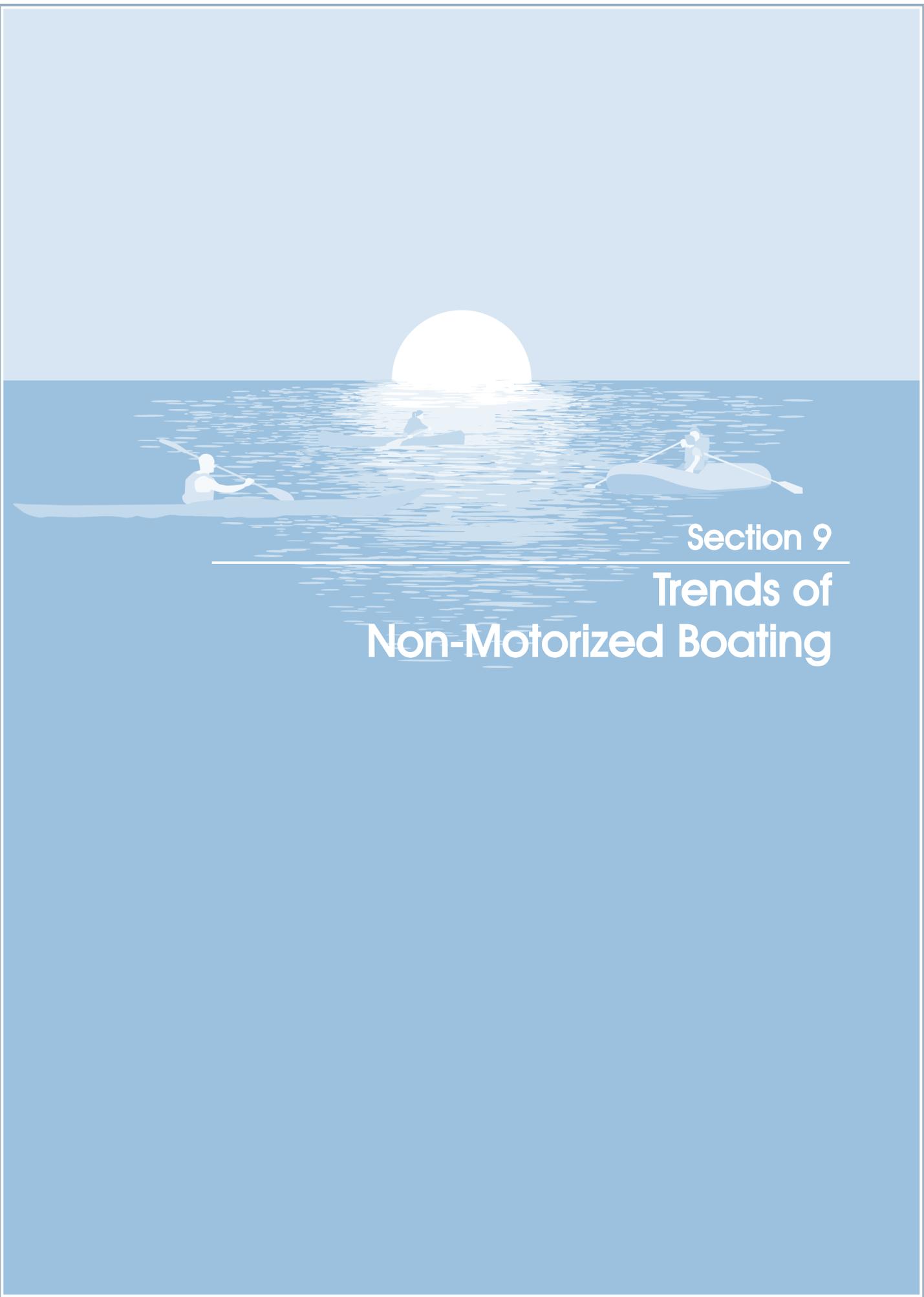
Reason for Participating	Percent of Respondents
1. For recreation	92%
2. For the physical and/or mental challenge	82%
3. To enjoy nature	82%
<b>4. For fitness</b>	<b>81%</b>
5. For leisure and relaxation	76%
6. As a social activity	72%
7. As a family activity	37%
8. For competition	33%
9. To participate in another activity*	18%
10. While camping	2%

\* Fishing, hunting, scuba diving, snorkeling, photography, bird-watching, etc.

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## Section 8 Endnotes

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- <sup>1</sup> In addition to the documents cited in this section, and the numerous references cited within those documents, the Outdoor Industry Foundation (OIF) web page, <http://www.outdoorindustryfoundation.org/youth.toolkit.research.html>, provides links to over twenty (20) government and scientific reports on the obesity epidemic, the necessity of physical activity, and the psychological benefits of nature.
- <sup>2</sup> U.S. Department of Health and Human Services. *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity* (Rockville, Maryland: U.S. Department of Health and Human Services, 2001).
- <sup>3</sup> Russell R. Pate, et al. "Physical activity and public health, a recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine." (*Journal of the American Medical Association*, Volume 273, Number 5, February 1, 1995, p.402).
- <sup>4</sup> U.S. Department of Health and Human Services, 2001.
- <sup>5</sup> California State Parks, *The Health and Social Benefits of Recreation* (Sacramento, California: California State Parks, March 2005).
- <sup>6</sup> California State Parks, 2005.
- <sup>7</sup> Danielle McNamara. "Kids on front line in weight battle." (*The Sacramento Bee*, June 25, 2007, p.B1).
- <sup>8</sup> David Chenoweth. *The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity* (North Carolina, Chenoweth & Associates for the California Department of Health Services, April 2005).
- <sup>9</sup> Ibid.
- <sup>10</sup> California State Parks, 2005.
- <sup>11</sup> California State Parks, 2005; and Centers for Disease Control and Prevention. "Physical activity for everyone: trails for health." (Centers for Disease Control, <http://www.cdc.gov/nccdphp/dnpa/physical/trails.htm>).
- <sup>12</sup> Mary Carmichael. "Health for life: stronger, faster, smarter." (*Newsweek*, March 26, 2007, p.38).
- <sup>13</sup> Personal communications with Michael Pratt, Director Division of Nutrition and Physical Activity, Centers for Disease Control and Prevention, June 5, 2006 and July 16, 2007; and Russell R. Pate, et al., 1995.
- <sup>14</sup> California State Parks, p.20.
- <sup>15</sup> Ibid.
- <sup>16</sup> Ibid.
- <sup>17</sup> Ibid.
- <sup>18</sup> M.S. Enkoji. "Great outdoors not so great among teens, survey finds." (*The Sacramento Bee*, October 3, 2006, p.A3).
- <sup>19</sup> Ibid.
- <sup>20</sup> Barbara Ainsworth, et al. "Compendium of physical activities: classification of energy costs of human physical activities." (*Medicine and Science in Sports and Exercise*, 1993, p.71).
- <sup>21</sup> Pratt, July 16, 2007.
- <sup>22</sup> Russell R. Pate et al., 1995.
- <sup>23</sup> Ainsworth, 1993.
- <sup>24</sup> Heidi Pederson and Molly Samuelson. "The Physiological Effects of Recreational Kayaking." (*Journal of Undergraduate Kinesiology Research*, Volume 1, 2005, p.30).
- <sup>25</sup> Ibid., p.37.
- <sup>26</sup> Lauren Young. "A different stroke." (*Business Week*, June 11, 2007, p.72).



Section 9

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# Trends of Non-Motorized Boating

# 9. Trends of Non-Motorized Boating

This section describes trends of non-motorized boating in California. The discussion of trends is based on findings from the statewide and regional random telephone surveys, the active-user Internet survey, the commercial/institutional survey, interviews with waterway managers, and secondary literature.

The section is organized as follows:

- A. *National Historical Trends in Non-Motorized Boating*
- B. *Implications of Survey Results for Trends in Non-Motorized Boating*
- C. *Summary of Trends on Non-Motorized Boating.*

## A. National Historical Trends in Non-Motorized Boating

In many ways, California is a unique setting for non-motorized boating. While national non-motorized boating participation studies do not exactly mirror California non-motorized boating participation studies, examining longer-term national trends provides a contextual backdrop for our discussion of non-motorized boating trends in California.

This subsection provides a discussion of non-motorized boating trends for each major non-motorized boat type, based on seven different national and regional non-motorized boating participation and/or sales studies:

1. *National Survey on Recreation and the Environment (NSRE)*<sup>1</sup>
2. *Outdoor Industry Foundation (OIF)*<sup>2</sup>
3. *The Recreation Roundtable Survey*<sup>3</sup>
4. *The National Recreational Boating Survey (NRBS)*<sup>4</sup>
5. *American Sports Data, Inc. (ASD) SUPERSTUDY of Sports Participation*<sup>5</sup>
6. *National Marine Manufacturers Association (NMMA)*<sup>6</sup>
7. *Sailing Industry Statistics.*<sup>7</sup>

These studies are described in **Appendix F**.

### 1. Canoeing

Data for national canoeing participation goes back to the first National Survey on Recreation in 1960.<sup>8</sup> National canoe participation rates increased gradually and fairly steadily from 2.0 percent the first year they were measured, to a high of 8.6 percent in 2001. Since 2001, canoe participation rates have dropped slightly to 7.8 percent of the United States population.

National canoe sales have been around 100,000 per year dating back to 1980, the first year data were available. The highest two sales years were 1981, at 126,000 canoes sold,



and 1999, with 121,000 canoes sold. However, on a per capita basis, the 1981 data reflects much higher sales, as there were 50 million fewer people in the United States in 1981, as compared to 1999. With the exception of 2004, when canoe sales saw a slight increase, canoe sales have dropped each year since 1999, and in 2005 were one of the lowest years on record, at 77,200 canoes sold nationwide.

Since 1999, the general slow decline in national canoe participation, and more rapid decline in national canoe sales, are in contrast to the rapid rise of recreational kayaking. Recreational kayaks are relatively inexpensive, easy to operate, and appropriate for entry level non-motorized boaters – even more so than canoes. That said, national canoe participation is still higher than any other type of non-motorized boat participation, and it is likely to continue to remain popular over the long-term, perhaps just not as popular as it has been.

### 2. Kayaking

National kayak participation rates were first measured in 1994, when they were still quite low, at 1.3 percent. In the early 1990s, kayaking was still a specialty sport, requiring a relatively high level of skill for either of the sport's two main subsets: whitewater kayaking or sea kayaking. By 2005, national kayak participation had increased to about 4.0 percent.<sup>9</sup>

The NMMA did not monitor national kayak sales until 2001, when they were already over 350,000 units sold per year, more than any other type of motorized or non-motorized boat.<sup>10</sup> By 2001, a new class of kayak called plastic recreational kayaks made up two-thirds of all kayak sales. Recreational kayak sales dropped slightly in 2003, but otherwise have increased each year they were measured, to a high of over 277,000 in 2005, a 17 percent increase since 2001.

While recreational kayak sales have grown significantly, sales for both whitewater and sea, or touring, kayaks have appreciably declined

since they were first measured in 2001. Inflatable kayak sales had their highest year on record in 2005, at 26,000 units – these boats reflect a small but fairly stable market.

The increase in kayaking appears to be driven by a rapid increase in recreational kayaking.<sup>11</sup> Both sales and participation data, when broken down by kayak type, show moderate declines in whitewater and sea kayaking, coupled with increases in recreational kayaking.

The significant sales of recreational kayaks over the last five years likely indicate two different trends. The first trend is a significant number of newcomers to non-motorized boating. The second trend is the widespread purchase of recreational kayaks by existing non-motorized boaters.

It seems unlikely that recreational kayak sales can continue to increase indefinitely at the current pace.<sup>12</sup> Sales of most other types of motorized and non-motorized boats follow a trend of increased sales to some point in time, and then gradually declining sales to about one-half, or less, of the maximum figure.

For example, outboard boat sales peaked in 1988 at 355,000, gradually declined, and have stabilized in the low 200,000 range for the last five years. Personal water craft (PWC) sales peaked in 1995 at 200,000, and since then have declined to about 80,000 over the last five years. Both of these motorized boat types are significantly more expensive than the average kayak, which may change the long-term sales dynamics.

It is too early to predict how kayak participation rates and sales will evolve over time. One hypothesis is that some percentage of the young people that are being introduced to recreational kayaks will graduate to more technical whitewater or sea kayaking as they reach their late teens and 20s. Similarly, to the extent that part of the increase in recreational kayaking is due to an increase in participation among aging Baby Boomers, some share of these individuals may

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become more serious about the activity as they retire, likely moving toward sea kayaking. Either of these situations could result in a reversal of the decline in whitewater and sea kayaking participation rates and sales over the next ten years.

Another, perhaps equally plausible, hypothesis is that recreational kayaking is just a passing trend.<sup>13</sup> If this is the case, kayak participation rates and sales will decline and stabilize over time. One of the reasons for their popularity is that recreational kayaks are inexpensive. With a low net investment in the activity, it may be easy for current participants to give up the sport when another activity attracts their interest.

### 3. Rafting (Inflatable Boats)

National participation rates for rafting were first measured in 1998.<sup>14</sup> Rafting participation covers a wide range, from “floating” in a raft to very technical whitewater rafting. National participation rates have remained fairly stable, at 5.0 percent or slightly more, since that time.

Sales of inflatable boats were monitored between 1980 and 1992, and then not again until 2003. Between 2003 and 2005, annual inflatable boat sales have been just over 30,000. Given the broad definition of inflatable boats (including boats with motors), and the use of boats for commercially guided trips, it is difficult to draw conclusions from inflatable boat sales data.

### 4. Sailing

There are no national participation data for sailboats 8 feet in length, or shorter. Sailing participation rates for all sizes of sailboats have historically covered a wide range, from 2.0 percent to 7.0 percent, depending on the year and the source of the study.<sup>15</sup> Participation rates are likely significantly lower for the three key types of 8 foot, or less, sailboats: Sabots, El Toros, and Optimists.

Members of sailing organizations estimated that 1,000, or less, of each of these three types of small sailboats are being used in California at this time.<sup>16</sup>

While small sailboat numbers are extremely low as compared to the total number of non-motorized boats in the State, each of these sailboats has an avid following. Interest in eight feet, and shorter, small sailing boats is reportedly increasing.

The NMMA, through The Sailing Company, provides national sales data for sailboats 11 feet in length, or shorter. Sales for sailboats 11 feet in length, or shorter, have declined by about one-half since 2000, from 8,123 units nationally, to 4,005. Again, it is impossible to determine what share of these boats, or this decline, are due to 8 foot, and shorter, boats. Historically, national sales of all sailboats have declined drastically, from a high of 77,100 in 1981. The lowest national sailboat sales year on record was 1991, with only 8,700 sailboats sold. Total national sailboat sales in 2005 were 14,400. A trend noted in the industry was toward sales of fewer, but larger and more expensive, sailboats.

### 5. Rowing

National participation data for rowing were limited, and there were no sales figures for rowing boats.<sup>17</sup> While rowing participation rates have fluctuated slightly since they were first measured in 1994, the 1994 rate and the 2003 rate (the last year measured) were essentially equal, at 3.6 percent and 3.7 percent, respectively.

### 6. Sailboarding and Kiteboarding

The conventional wisdom regarding sailboarding (windsurfing) trends is that the sport had its boom in the 1980s and early 1990s, and has since declined.<sup>18</sup> It is difficult to discern this trend in the national participation data, as participation rates are relatively low, thus making it difficult to accurately measure.

**Table 9.1**  
**Years of Participation for Non-Motorized Boat**  
**Owners, Statewide Random Survey (2006) (n=351)**

Years of Participation	Percent of Respondents
Less than 5 years	14%
5 to 9 years	13%
10 to 14 years	11%
15 to 20 years	15%
<b>Over 20 years</b>	<b>46%</b>
NA	1%
<b>Total</b>	<b>100%</b>

The sailboarding participation data does not go back far enough to show the reportedly rapid growth in the sport when it was introduced in the United States in the late 1970s and early 1980s. Sailboarding national participation rates were first measured in 1987, at 0.8 percent. Participation stayed at about the same level for several years, and then declined to 0.6 percent in 1999. The data appeared to show a slight increase since 2002, to 0.7 percent, although the change is not statistically significant.

The NMMA tracked national sailboard sales between 1980 and 1990. National sailboard sales grew rapidly between 1980 and 1987, increasing from 21,000 to 70,000 over eight years. After 1987, sailboard sales declined just as rapidly, reaching 42,000 in 1990, after which sales were not measured.

Kiteboarding, introduced in the late 1990s, appears to be drawing new participants from current and potential windsurfers. There were no data on kiteboard sales or participation; however, all anecdotal comments pointed to relatively rapid growth of this activity.

## B. Implications of Survey Results for Trends in Non-Motorized Boating

The statewide and regional random surveys and active-user Internet survey included several questions intended to help evaluate participation trends in non-motorized boating.

Trends identified in the statewide random survey can be extrapolated to the State population. **Table 9.1**, left, provides the statewide random survey results for the length of time that respondents had been involved in non-motorized boating. Almost one-half of respondents had been involved in non-motorized boating for more than 20 years. The remaining responses were split between the other years of participation categories.

Fourteen percent of California statewide NMB survey respondents, equivalent to an estimated 135,759 households statewide, had been participating in non-motorized boating for less than five years.<sup>a</sup> By subtracting 135,759 households from our 2006 estimate for non-motorized boat-owning households (969,707), we estimate that in 2002 there were 833,948 non-motorized boat-owning households. This represents an average annual compound rate of growth of 3.84 percent between 2002 and 2006. If we assume that this same annual 3.84 percent rate of growth continues to 2010, then the projected number of households owning non-motorized boats in 2010 would be 1,127,455.

We calculated the number of non-motorized boating participants in households that own non-motorized boats by multiplying the number of households by the average participants per household in 2006 (2.41), and the percent of households that boated in the last five years (82

<sup>a</sup> Calculated by multiplying 14 percent by the number of households owning non-motorized boats in 2006, which was 969,707.

**Table 9.2****Estimated Number of California Households and Participants Owning Non-Motorized Boats (2002, 2006, and 2010)**

Year	Persons per Household	California Households <sup>a</sup>	Incidence Rate, Percent of Households Owning Non-Motorized Boats	Number of Households Owning Non-Motorized Boats	Number of Participants in Households Owning Non-Motorized Boats <sup>b</sup>
2002	2.921	11,726,044	7.11%	833,948	1,648,048
<b>2006</b>	<b>2.938</b>	<b>12,368,706</b>	<b>7.84%</b>	<b>969,707</b>	<b>1,916,335</b>
2010	2.938	13,320,516	8.46% <sup>c</sup>	1,127,455	2,228,077

<sup>a</sup> State of California, Department of Finance

<sup>b</sup> Based on 2.41 participants per household, and 82 percent who boated in the last five years

<sup>c</sup> This rounded 8.46 percent incidence rate is calculated by dividing 1,127,455 by 13,320,516. The actual unrounded incidence rate is 8.46405 percent.

**Table 9.3****Range Projections for Number of California Households and Participants Owning Non-Motorized Boats (2010)**

Option	Incidence Rate, Percent of Households Owning Non-Motorized Boats	Number of Households Owning Non-Motorized Boats	Number of Participants in Households Owning Non-Motorized Boats
Low Estimate	7.84%	1,044,328	<b>2,063,801</b>
Medium Estimate	8.46%	1,127,455	<b>2,228,077</b>
High Estimate	8.64%	1,150,893	<b>2,274,395</b>

percent). We applied the 2.41 participants per household and 82 percent active participants to the 2002, 2006, and 2010 number of boat-owning households.

Using this methodology, **Table 9.2**, above, provides estimates and projections for the number of households owning non-motorized boats and the number of participants owning non-motorized boats in 2002, 2006, and 2010. Table 9.2 also provides the number of households in California, and the incidence rate, for those three years.

The incidence rate for 2006 is from the statewide random survey, while the incidence rates for 2002 and 2010 are calculated by dividing boat-owning households by total households. The estimated number of households in California for 2010 is based on Department of Finance estimates for the California population in 2010, multiplied by the number of persons per household in 2006,

the most recent year for which this data was available. The 2010 projection in Table 9.2 assumes the same 2.41 participants per household, and the 82 percent active participation.

**Table 9.3**, above, provides two additional 2010 projections (one a lower projection and one a higher projection) for the number of households owning non-motorized boats, and the number of participants in households owning non-motorized boats. The calculations for number of participants are again based on 2.41 participants per household and 82 percent of households participating in the last five years.

The most conservative estimate, the Low Estimate, assumes no change of incidence rate, and simply applies the 2006 incidence rate of 7.84 percent to the projected number of households in 2010. Thus, for the Low Estimate, all non-motorized boating growth is based only on Department of Finance population projections.

The Medium Estimate is based on the methodology described above, using the growth rate in number of households, based on the annual historical compound rate of growth from 2002 to 2006.

The High Estimate results in the largest projection, and is based on the annual historical compound growth rate of the incidence rate from 2002 to 2006, and the Department of Finance population projections. The High Estimate applies an 8.64 percent incidence rate to the estimated number of households in 2010. These three estimates all fall within a 10 percent range, and provide a reasonable basis from which to project non-motorized boating participation over the next several years.

These projections do not include estimates for increased non-motorized boating participation through clubs, rentals, instruction, or guided trips. One can predict that these categories of non-motorized boating participation will increase in future years as well.

To provide further insight into non-motorized boating participation trends, we examined the demographic characteristics of boaters in the statewide random survey. Because the statewide random telephone survey loses statistical power as the results are based on fewer respondents, these data should be evaluated for their overall trends, not absolute numbers. The active-user Internet survey results, also discussed in this subsection, do not reflect a random sample, but rather a subset of involved boaters.

The statewide random survey results for boaters participating less than five years (n=49) show some interesting trends in new boater participants. Fewer new boaters were Caucasian, and more new boaters were Asian, Black, or Latino. This finding would indicate that perhaps non-motorized boating is becoming more diverse, reflective of the diverse population in the State. New boaters also tended to be less educated, and have less household income,

than the overall population of boaters. However, these characteristics may be a reflection of the generally younger age of new boaters. Demographic characteristics of new active-user non-motorized boaters reflected similar trends.

The age that individuals start participating in non-motorized boating can provide insight into future participation trends. Among statewide random survey respondents boating less than five years, there was a greater proportion of young new boaters (24 years or less). There were also more new boaters in the middle age groups, 35 to 44 and 45 to 55.

Examining the ages of non-motorized boaters in each of the statewide random survey categories for “years of non-motorized boating participation” also supported the finding that many boaters started the activity either as young adults or in middle age. Individuals may start participating in non-motorized boating at any age. However, two distinct age groups emerged when individuals were most likely to start participating in non-motorized boating: (1) in their late teens and early twenties, or (2) in their forties or early fifties.

The fact that more individuals start participating in non-motorized boating in these two age groups seems intuitively reasonable. Many people in their early twenties are exploring new activities, and may try activities that they did not participate in as a child. At the younger end of the middle age group, individuals in their early 40’s may be trying new family activities as their children get old enough. At the older end of the middle age group, individuals whose children have left home may be looking for new recreational activities.

Given the age characteristics of California’s population, one might predict that non-motorized boating will continue to grow over the next several years. In 2005, approximately 28 percent of California’s population was under the age of 18.<sup>19</sup> Another 8 percent of the 2005 population was

between the ages of 18 and 24. Approximately 14 percent of the 2005 California population was between the ages of 45 and 54. This latter age group represents a portion of the Baby Boomer generation, which currently covers those in their early 40's to early 60's (those born between 1945 and 1964). As this large (and active) segment of the population reaches later into middle age and retirement, they are expected to boost participation in many recreational activities.<sup>20</sup> In addition, as the children of Baby Boomers approach young adulthood, they are also likely to increase participation in recreational activities (although perhaps not the same activities as their parents).

It is likely that much of the recent growth in non-motorized boating reflects increased participation in the front-end of the Baby Boomer generation and that of their children. If this is the case, we might expect a continued increase in non-motorized boating participation over the next several years. However, we would also expect an eventual decline in participation as these two cohorts continue to age.

California's growing population will also impact participation in non-motorized boating. California's population is expected to reach 50 million before 2050, increasing from 37 million in 2006.<sup>21</sup> The California State Parks report notes that, "with this level of growth, even activities with static or declining rates of participation will grow in absolute terms because there will be more Californians to participate."<sup>22</sup> Those activities with increasing participation rates will have even greater growth in participation.

In considering future levels of non-motorized boating, the total days of statewide non-motorized boating participation will also be impacted by existing boaters. Statewide random survey respondents were asked whether they expected to increase, or decrease, participation in non-motorized boating over the next five years.

**Table 9.4**, above, summarizes these results.

**Table 9.4**  
**Expected Change in Non-Motorized Boating Participation Over the Next Five Years, Statewide Random Survey (2006) (n=351)**

Change in Participation	Percent of Respondents
<b>A lot more</b>	<b>14%</b>
<b>A little more</b>	<b>24%</b>
About the same	48%
A little less	6%
A lot less	7%
NA	1%
<b>Total</b>	<b>100%</b>

Almost one-half of statewide random survey respondents expected to participate in non-motorized boating at the same (current) level over the next five years. Of the remaining participants, the majority expected to participate either a lot more, or a little more, with fewer expecting to participate less.

Answers to this question may be skewed toward increased participation, as people tend to answer these types of questions optimistically. Still, the vast majority of respondents expected to maintain, or increase, participation in non-motorized boating. There were relatively few differences in expected participation over the next five years between the most experienced non-motorized boaters (over 20 years) and the newer non-motorized boaters (9 years or less).

It is difficult to predict how increased participation among current non-motorized boaters could impact total participation days. In the statewide random survey, the average number of days of participation in non-motorized boating was 24, and the median number of days of participation was 10. More than one-half of respondents (55 percent) participated in non-motorized boating between one and ten days per year. Approximately 40 percent of respondents participated in non-motorized boating between 11 and 100 days per

year, and very few respondents (5 percent) participated more than 100 days per year.

Respondents that expected to participate more in non-motorized boating primarily did so because: (1) they enjoy the activity; (2) they will have more free time; or (3) they want to spend time with their family. **Table 9.5**, right, summarizes reasons for increased participation. (Note: the total adds to more than 100 percent because respondents could identify more than one reason.)

Respondents that expected to participate less in non-motorized boating primarily did so because: (1) of health issues; (2) they are no longer interested; or (3) they are getting too old. These findings support the hypothesis that as Baby Boomers reach an age when they are no longer active, overall non-motorized boating participation may decline. **Table 9.6**, right, summarizes reasons for decreased participation in non-motorized boating.

Trends identified in the non-random active-user Internet survey reflect the opinions of a small, but very active, group of non-motorized boaters. While they are not reflective of the general State population, they do provide insight into an important component of the non-motorized boating community. The active-user Internet survey participation trends are described below.

In comparing years of participation in non-motorized boating between the statewide random survey respondents and active-user Internet respondents, fewer of the active-user respondents have participated in non-motorized boating for more than 20 years, and more have participated less than ten years. **Table 9.7**, right, provides the years of participation for active-user Internet survey respondents. **Table 9.8**, on the next page, provides the expected participation in non-motorized boating in the next five years, for active-user Internet survey respondents. Among this group, more respondents expected to increase participation, compared to the statewide random survey respondents.

**Table 9.5**  
Reasons for Increasing Non-Motorized Boating Participation, Statewide Random Survey (2006) (n=135, with 287 total responses)

Reasons for Increasing Participation	Percent of Respondents
Enjoy the activity	53%
More free time	52%
To be with family	40%
Improved skill level	19%
To be with friends	18%
To try new types of boating	13%
Fixing or buying a new boat	6%
Replacing another hobby	5%
Other	7%

**Table 9.6**  
Reasons for Decreasing Non-Motorized Boating Participation, Statewide Random Survey (2006) (n=44, with 67 total responses)

Reasons for Decreasing Participation	Percent of Respondents
Health, illness, or injury	52%
No longer interested	30%
Getting too old	20%
Not enough time	14%
Using or getting a motorboat	9%
Lack of or inadequate facilities	7%
Family is too young	7%
Participating in other activities	5%
Other	9%

**Table 9.7**  
Years of Participation for Non-Motorized Boat Owners, Active-User Internet Survey (2006) (n=1,518)

Years of Participation	Percent of Respondents
Less than 5 years	17%
5 to 9 years	20%
10 to 14 years	15%
15 to 20 years	13%
Over 20 years	32%
NA	3%
<b>Total</b>	<b>100%</b>

**Table 9.8**  
**Expected Change in Non-Motorized Boating Participation Over the Next Five Years, Active-User Internet Survey (2006) (n=1,518)**

Change in Participation	Percent of Respondents
A lot more	22%
A little more	29%
About the same	41%
A little less	4%
A lot less	1%
NA	3%
<b>Total</b>	<b>100%</b>

**Table 9.9**  
**Reasons for Increasing Non-Motorized Boating Participation, Active-User Internet Survey (2006) (n=778, with 2,285 total responses)**

Reasons for Increasing Participation	Percent of Respondents
Enjoy the activity	79%
Improved skill level	57%
To be with friends	46%
More free time	36%
To be with family	29%
Replacing another hobby	18%
To try new types of boating	16%
Fixing or buying a new boat	1%
Other	1%

**Table 9.10**  
**Reasons for Decreasing Non-Motorized Boating Participation, Active-User Internet Survey (2006) (n=62, with 88 total responses)**

Reasons for Decreasing Participation	Percent of Respondents
Not enough time	60%
Lack of access	16%
Lack of or inadequate facilities	13%
Logistics make difficult	11%
Health, illness, or injury	11%
Getting too old	8%
Family is too young	8%
No longer interested	8%
Poor water quality	3%
Using or getting a motorboat	2%
Other	2%

For active-user non-motorized boaters, participating more in non-motorized boating means participating in many more days per year as compared to statewide random survey respondents. Active-user boaters participated in non-motorized boating an average of 73 days, and median of 50 days per year.

The reasons for increasing, or decreasing, non-motorized boating participation were somewhat different for the active-user survey respondent, as compared to the average statewide survey respondent. A greater percentage of active-user respondents simply enjoy the activity. A majority of respondents also expected to increase participation because they were increasing their skill level. In addition, more active-user respondents expected to increase participation to be with friends, and fewer as a family activity, than the statewide random survey respondents.

**Table 9.9**, left, summarizes the reasons active-user respondents expected to increase participation. **Table 9.10**, following Table 9.9, summarizes the reasons active-user respondents expected to decrease participation in non-motorized boating. The majority of active-user respondents expect to decrease participation because they do not have enough time, as compared to the statewide respondents, for whom health and age were major reasons.

## C. Summary of Trends on Non-Motorized Boating

This final subsection discusses and synthesizes general trends in non-motorized boating, as observed by the many individuals and organizations that participated in this study of non-motorized boating in California.

Non-motorized boating trends identified by commercial/institutional survey respondents reflect the opinions and observations of individuals that are closely, and actively, involved

in non-motorized boating. More than one-half of commercial survey respondents have been in the industry for more than 15 years. Thus, these respondents provided an experienced perspective. They also provided a wide range of perspectives, depending on the types of services they offered and types of non-motorized boats they used.

Overall, commercial survey respondents noted a general increase in non-motorized boating participation among beginners, particularly recreational kayaking (at the expense of canoeing). With the increase in recreational kayaking comes increases in both family and beginner participation. This also means a growing number of inexperienced boaters, pointing to a need for expanded non-motorized boating education and instruction.

Several commercial survey respondents noted that in addition to the rapid growth in beginner level recreational kayaking, sea kayaking is increasing in popularity. Kayak fishing was identified as one of the fastest growing segments of both the paddle sports and fishing industries.

In general, whitewater rafting outfitters have seen a reduction in commercial participation since the early to mid-1990s, when participation peaked. Some outfitters have noticed that commercial participation is once again growing, but is also highly dependent on water levels. One growth area for commercially guided raft trips was the “luxury trip”, providing gourmet food and wine, along with whitewater. Rafting outfitters also noted that many commercial participants have less time, and are interested in shorter (half or one-day) trips. Other trends rafting outfitters identified were: (1) declining participation among youth; and (2) a broader diversity of customers than in the past.

Commercial survey respondents in the sailboarding/kiteboarding industry commented that kiteboarding is growing exponentially, while sailboarding is declining or holding steady.

River managers, typically Federal, State, or County employees, also identified several trends in non-motorized boating.<sup>23</sup> One observation on river use trends was that private kayak participation on whitewater rivers was down, while guided trip participation numbers were steady. A second observation was that as the population is aging, non-motorized boaters are less interested in camping, and more interested in finding a motel and nice restaurant after a day of kayaking.

A growing trend among whitewater kayakers is the practice of “playboating”. Playboating is when boaters stay in one location in the river and “play” in the hydraulics, rather than running a stretch of the river.

In general, the ability to monitor river flows on the Internet has increased the number of private boaters (primarily whitewater kayakers) running rivers in the winter off-season period. After a winter storm, boaters now check river flows on various web pages, and if flows are high enough, they can be on the river within a few hours. Prior to the availability of such real-time river flow information, boaters would have to drive to the river to see whether it could be run.

Generally, river managers noted that it is difficult to track overall river paddling trends year-to-year from participation data because typically a high water year attracts more users, while a low water year attracts fewer users. Historical river use data are provided in Appendix D.

The South Fork of the American River has far higher participation levels than any other whitewater river in the State (and is among the most popular rivers nationally). Participation in commercial rafting on the South Fork varies widely, and appears to be increasing over the last few years, since achieving a low point in 2001. Participation on most other rivers has varied somewhat over time, although commercial rafting participation on most rivers appears to be relatively stable.

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In summary, we make the following observations on trends in non-motorized boating in California:

- The majority of those that do participate in non-motorized boating expect to either keep participating at the same levels, or increase participation, over the next five years.
- Non-motorized boating participation may slow or decline when Baby Boomers become too old to participate.
- Typical participants view non-motorized boating as an enjoyable recreational activity and a way to spend time with their families. More actively involved non-motorized boating participants also view non-motorized boating as an enjoyable activity, but are more focused on the challenge and skill required, as well as the social aspects of the activity.
- Kayaks account for almost one-half of estimated non-motorized boating participation days. The majority of kayak participation is by non-motorized boat owners.
- Commercial river rafting in California is a major non-motorized boating activity, particularly in the Sacramento Basin and Central Valley regions. This activity has generally declined since the mid-1990s, and is often dependent on rainfall. However, participation has been increasing in recent years.
- Canoeing participation is generally declining, although it has never been particularly popular in California, as compared to other states.
- Beginner-level and family-oriented recreational kayaking is growing. Recreational kayaks are popular because of their ease of use and low cost. This creates a need for education and instruction among these often inexperienced boaters.
- The increase in recreational kayaking may be a passing trend, or it may be an entry point to other types of non-motorized boating. It is possible that the majority of new non-motorized boaters that recently purchased recreational kayaks will eventually give up kayaking for another activity.<sup>24</sup> However, some smaller percentage of new recreational kayakers may continue in the sport, advancing to sea kayaking, whitewater kayaking, or some other non-motorized boating activity.
- Team and competitive non-motorized boating such as outrigger canoeing, rowing (crew), and dragon boat racing, are likely to remain niche activities. These sports have an active and avid following, but total participation numbers are relatively low.
- Participation in sailboarding has been fairly steady at a low level, although there are a number of avid sailboarders in certain regions of the State (San Francisco Bay Area, South Coast, San Diego). Kiteboarding, while still a small niche activity, is increasing rapidly, albeit from a small base.
- The number of non-motorized boat-owning households, and participants within those households, has increased at an estimated annual compound rate of growth of 3.84 percent over the last four years (from 2002 to 2006). Projecting forward, the number of non-motorized boat-owning households is expected to increase to between 1.044 million to 1.151 million, by 2010. The number of non-motorized boating participants in those households is projected to range from 2.064 million to 2.274 million in 2010.
- The number of non-motorized boating participants is expected to continue to increase. The largest share of new non-motorized boaters are young adults and those in their 40's and 50's. As the Baby Boomer generation ages and retires, it is likely that this large, and active, cohort will continue to drive increases in the number of non-motorized boaters. At the same time, the children of Baby Boomers are at an age when they are trying new activities, including non-motorized boating.

## Section 9 Endnotes

- <sup>1</sup> For the 1960-1961 survey: Abbott L. Ferriss, et al., *National Recreation Survey* (Washington D.C.: prepared for the Outdoor Recreation Resources Review Commission, ORRC Study Report 19, 1962); For the 1982-1983 survey: National Park Service, *1982-1983 Nationwide Recreation Survey* (Washington D.C.: U.S. Department of Interior, National Park Service, April 1986); For the 1994-1995 survey: H. Ken Cordell, Jeff Teasley, and Greg Super, *Outdoor Recreation in the United States: Results from the National Survey on Recreation and the Environment* (Athens, Georgia: Prepared for the USDA Forest Service, August 1997), and H. Ken Cordell, et al., *Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends* (Athens, Georgia: Sagamore Publishing, 1999); for the 1999-2004 survey: H. Ken Cordell, et al., *Outdoor Recreation for 21<sup>st</sup> Century America* (State College, Pennsylvania: Venture Publishing, Inc., 2004), United States Forest Service, *Recreation and Tourism Statistics Update, Participation in Outdoor Activities by People Living in Region 5* (Athens, Georgia: Southern Research Station, USFS, April 2006), United States Forest Service, *1999-2000 National Survey on Recreation and the Environment* (Athens, Georgia: Southern Research Station, USFS, 2001), H. Ken Cordell, et al., "United States of America: Outdoor Recreation," Chapter 16 in *Free Time and Leisure Participation: International Perspectives* (CAB International, 2005), and Vernon R. (Bob) Leeworthy et al., *Projected Participation in Marine Recreation: 2005 and 2010* (Silver Spring, Maryland: National Oceanic and Atmospheric Administration and U.S. Forest Service, March 2005). With the exception of the published books, studies from the NSRE are available at: <http://www.srs.fs.usda.gov/trends/Nsre?nsre2.html>.
- <sup>2</sup> Leisure Trends Group, *Outdoor Recreation Participation Study, Seventh Edition, For Year 2004* (Boulder, Colorado, Outdoor Industry Foundation and Outdoor Industry Association, June 2005); and Leisure Trends Group, *Outdoor Recreation Participation Study, Eighth Edition, For Year 2005* (Boulder, Colorado, Outdoor Industry Foundation and Outdoor Industry Association, June 2006).
- <sup>3</sup> Roper ASW, *Outdoor Recreation in America 2003: Recreation's Benefits to Society Challenged by Trends* (Washington D.C., prepared for The Recreation Roundtable, January 2004).
- <sup>4</sup> Strategic Research Group, *2002 National Recreational Boating Survey State Data Report* (Columbus, Ohio: prepared for the United States Coast Guard, November 30, 2003); and Strategic Research Group, *2002 National Recreational Boating Survey Report* (Columbus, Ohio: prepared for the United States Coast Guard, November 30, 2003).
- <sup>5</sup> American Sports Data, Inc., *The Superstudy<sup>®</sup> of Sports Participation Volume 3, Outdoor Activities 2005* (Cortland Manor, New York: American Sports Data, Inc., 2006); and American Sports Data, Inc., "California"; "Ethnicity", and "Lifestyle Segments" reports (Cortland Manor, New York: American Sports Data, Inc., 2006).
- <sup>6</sup> National Marine Manufacturers Association, *2005 Recreational Boating Statistical Abstract* (Chicago: NMMA, 2006).
- <sup>7</sup> The Sailing Company, *2006 State of the Industry* (Middletown, Rhode Island: The Sailing Company, 2006).
- <sup>8</sup> Ferriss et al., 1962. Canoeing trends based on: NSRE, NMMA, Roper ASW, OIF, and ASD.
- <sup>9</sup> Kayaking trends based on: NMMA, NSRE, OIF, and ASD.
- <sup>10</sup> NMMA, 2006.
- <sup>11</sup> NMMA, 2006; Leisure Trends Group, June 2006; and M.S. Enkoji, "Active gift giving: tastes change, so make selections carefully" (The Sacramento Bee, November 27, 2007, B1).
- <sup>12</sup> Matt McClellan, "Kayak makers turn to innovation" (Plastics News, August 9, 2004, p.1)
- <sup>13</sup> M.S. Enkoji, November 27, 2007. Enkoji cites the decline of in-line skates as an example of a fading sports trend.
- <sup>14</sup> Rafting trends based on: NSRE, NMMA, OIF, and ASD.
- <sup>15</sup> Sailing trends based on: NMMA, NSRE, The Sailing Company, Roper ASW, and personal communications with: Steve Lowry of El Toro International Yacht Racing Association, Steve Sherman and Susan Dennis of United States Optimist Dinghy Association, and Tom Newton of International Naples Sabot Association.
- <sup>16</sup> Personal communications with: Steve Lowry of El Toro International Yacht Racing Association, Steve Sherman and Susan Dennis of United States Optimist Dinghy Association, and Tom Newton of International Naples Sabot Association.

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<sup>17</sup> Rowing trends based on: NSRE, and Roper ASW.

<sup>18</sup> Sailboarding trends based on: NSRE and ASD.

<sup>19</sup> U.S. Census Bureau. "California General Demographic Characteristics: 2005." (U.S. Census Bureau, <http://factfinder.census.gov>.)

<sup>20</sup> California State Parks. Park and Recreation Trends in California (Sacramento, California: California State Parks, May 13, 2005).

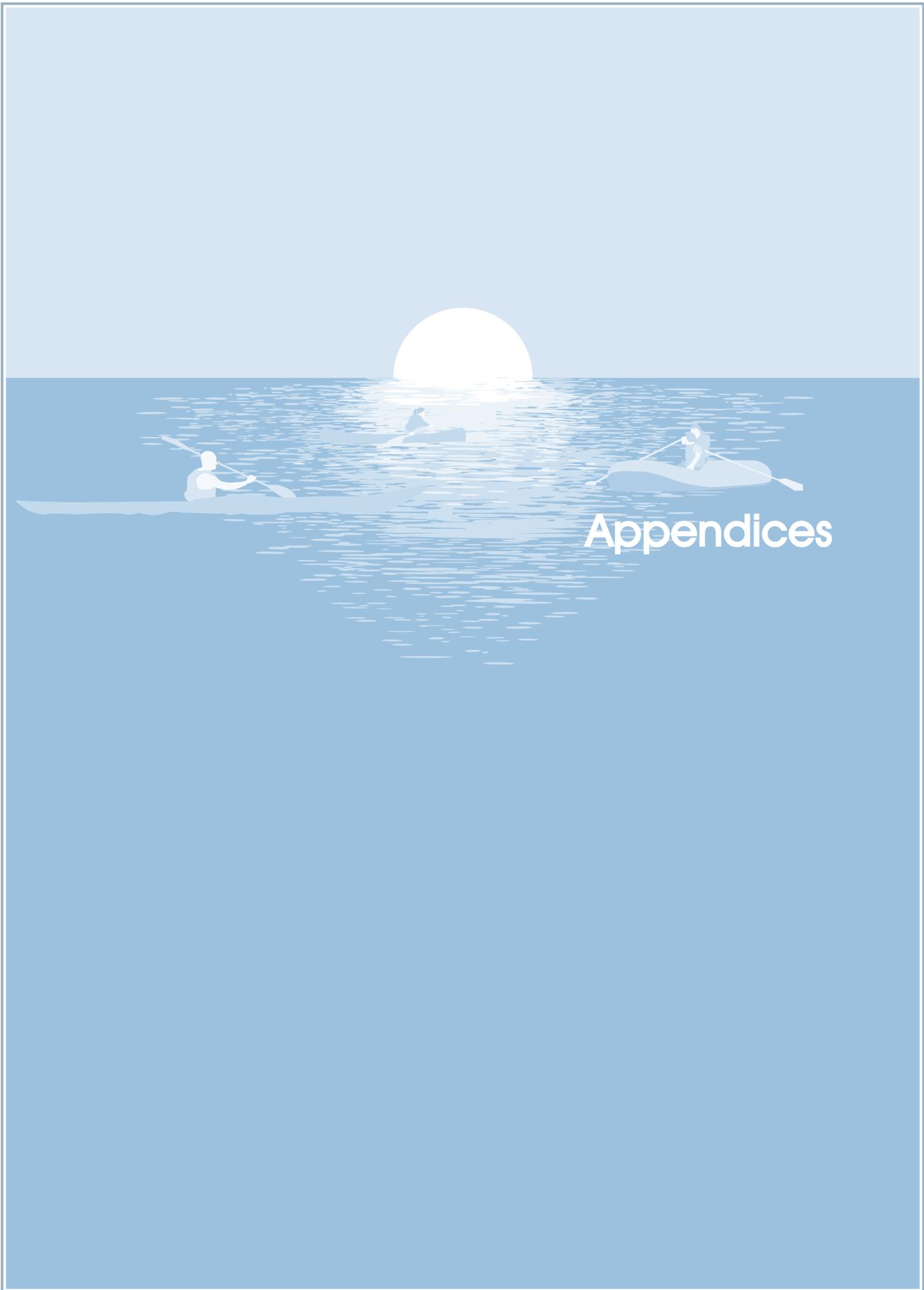
<sup>21</sup> California State Parks, 2005.

<sup>22</sup> *Ibid.*, p.2.

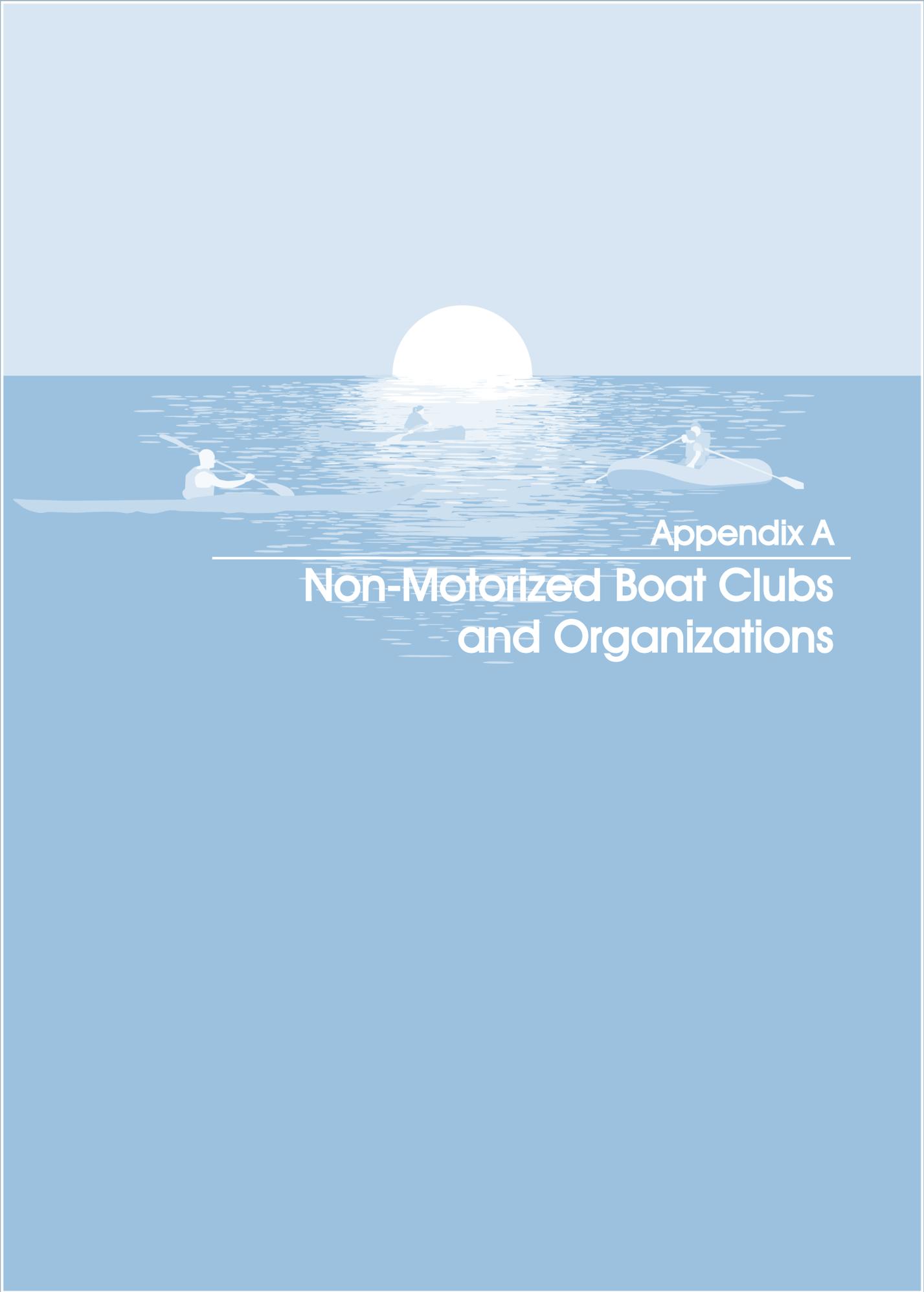
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<sup>23</sup> Personal communications with: Gay Baxter, Klamath National Forest; Jeff Horn, Folsom Office of the Bureau of Land Management; Cheryl Bowen, Sequoia National Forest; Noah Rucker-Triplett, El Dorado County; Jim Michaels, California State Parks; Bill Deitchman, California State Parks; Steve Welch, Stanislaus National Forest; John Swanson, Stanislaus National Forest; Terry Schumaker, Sierra National Forest; and Jennifer Munn, Tulare County.

<sup>24</sup> For example, Enkoji, November 27, 2007, cites that in-line skating participation dropped by more than half between 1998 and 2005; McClellan, August 2004, noted that the kayak industry growth was slowing.



# Appendices



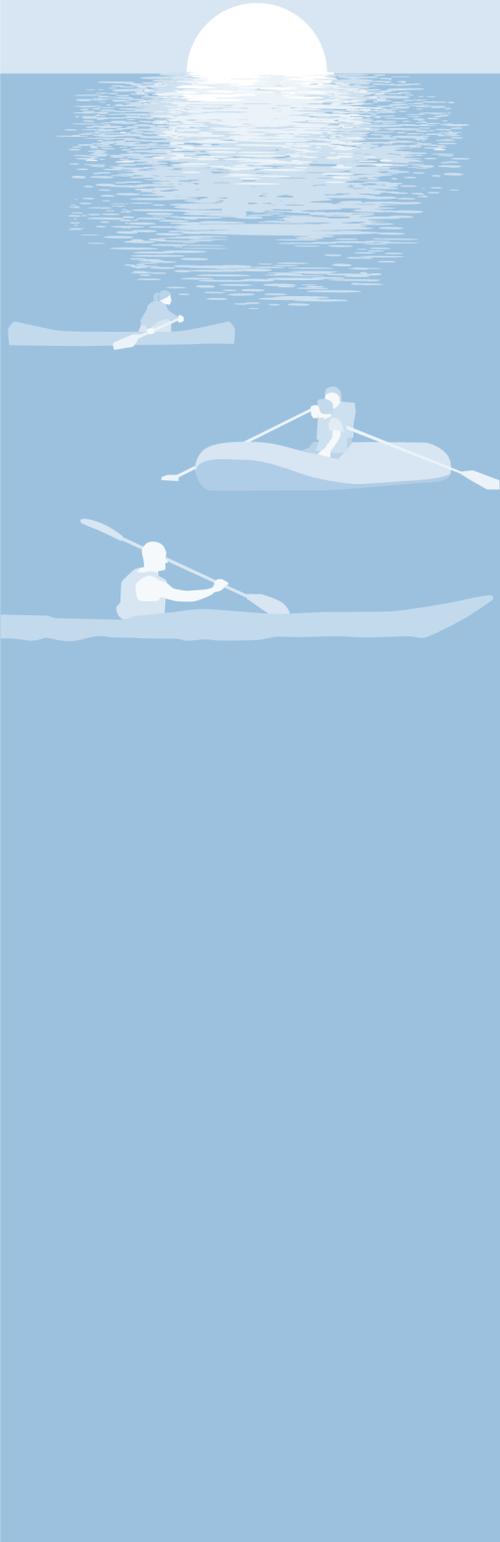
Appendix A

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# Non-Motorized Boat Clubs and Organizations

# A. Non-Motorized Boat Clubs and Organizations

This appendix identifies 130 non-motorized boating clubs (**Exhibit A.1**). Most of these clubs are local or regional boating organizations based in California communities. The club list also includes a number of national organizations, as well as Internet-based groups. In some cases, this list identifies organizing bodies, such as the California Dragon Boat Association, but not each of the individual dragon boat clubs. **Exhibit A.2**, following Exhibit A.1, is a list of 68 California rowing clubs that are members of United States Rowing.



## A. Non-Motorized Boat Clubs and Organizations

### Exhibit A.1 Selected Non-Motorized Boating Clubs and Organizations (2006)

Page 1 of 7

Organization Name	Web Page	Location	Boat Types	Scope	General Description
1. Akauhana Outrigger Canoe Club	akauhana.org	Santa Cruz, CA	Outrigger canoes	Local club	Outrigger canoe club
2. All Kayak Fishing	allkayakfishing.com				Information on kayak fishing
3. American Canoe Association	americancanoe.org	7432 Alban Station Blvd., Springfield, VA 22150	Canoes, Kayaks (all), Rafts	National	Club members with kayaks, canoes, rafts. Works on water access issues and safety, provides support for local clubs and organizations
4. America Outdoors	americaoutdoors.org	P.O. Box 10847, Knoxville, TN 37939	Canoes, Kayaks (all), Rafts	International	Association representing travel outfitters, tour companies and others. Provides search engine for whitewater rafting, canoeing, kayak touring, guest ranch vacations, bicycle touring, fishing trips, and other outdoor services
5. American Rivers	americanrivers.org	1101 14th St. NW, Suite 1400, Washington, DC 20005		National	A national non-profit conservation lobby and organization dedicated to protecting and restoring rivers
6. American Whitewater	americanwhitewater.org	P.O. Box 1540, Cullowhee, NC 28723		National	A national organization dedicated to protecting rivers with three focuses: River Stewardship, Safety, and Outreach
7. Bass-n-Tubes	bass-n-tubes.com	San Jose		Northern California	Float tube, kickboat, and kayak bass fishing club
8. Bay Access, Inc.	bayaccess.org	P.O. Box 303, Forest Knolls, CA 94933		Local San Francisco area	SF nonprofit organization of kayakers dedicated to improving non-motorized boat access and water trails
9. Bay Area Kiteboarding	bayareakiteboarding.com			San Francisco Bay area	Website with information on San Francisco Bay Area Kiteboarding
10. Bay Area Sea Kayakers	bask.org	BASK c/o Penny Wells, 229 Courtright Rd., San Rafael, CA 94901	Sea kayaks	Local San Francisco area	SF group providing training, boating trips and monthly presentations
11. Benicia Outriggers	n/a	Benicia, CA	Outrigger canoes	Local club	Outrigger canoe club
12. Berkeley Rowing Club	n/a	2817 Piedmont Ave., Berkeley, CA 94705		Local club	Local chapter of U.S. Canoe/Kayak organization
13. Big Water's Edge	bigwatersedge.com		Kayaks		Kayak fishing group
14. Boater Talk	boatertalk.com				Whitewater boating information
15. British Canoe Union	bcuna.com	New York	Canoes, kayaks	International	Governing body for canoeing and kayaking. Provides instructional training and ratings.
16. California Adventures	caladventures.com			Online club	Web space for and a directory of paddling and other outdoor and travel activities
17. California Dragon Boat Association	cdba.org	California Dragon Boat Association (CDBA), 268 Bush St, #888, San Francisco, CA 94104	Dragon boats	Local San Francisco area	A non-profit, 501(c)3 organization promoting dragon boating in the Bay Area. Organizes competitions and facilities
18. California Floaters Society	cfsonline.org		Kayaks, Rafts, Canoes	Online Northern California club	An online networking club organizing river trips, trading and selling river gear, reporting river news, events, and river hazards. Paddling club for all types of river craft

**Exhibit A.1**  
**Selected Non-Motorized Boating Clubs and Organizations (2006) (continued)**

Organization Name	Web Page	Location	Boat Types	Scope	General Description
19. California Hydropower Reform Coalition	calhrc.org	California Hydropower Reform Coalition, 2140 Shattuck Ave., Suite 605, Berkeley, CA 94704		Statewide	Coalition to protect and restore California rivers impaired by hydropower dams with a Steering Committee representing environmental, fishing, and river recreation organizations
20. California Kayak Friends	ckf.org		Kayaks, Rafts, Canoes	Southern Cal and Southern NV area club	Club for paddlesport enthusiasts including sea kayaking, river runners and canoeists
21. Central California Canoe Club	carlwoodard.com/c4	P.O. Box 1821 Nevada City, CA 95959	Rafts, Canoes	Northern California	A local paddling club
22. Chico Paddleheads	chicopaddleheads.org		Kayaks, Rafts, Canoes	Chico area	Website for researching rafting and other information
23. Class II Kayakers	groups.yahoo.com/group/class2wokayakers	Northern California	Kayaks	Regional	Trip organization group for Northern California kayaking
24. Dana Outrigger Canoe Club	danaoutrigger.net	Dana Point Harbor, CA		Local club	Outrigger canoe club
25. Explore North Coast	explorenorthcoast.net	P.O. Box 4712 Arcata, CA 95521	Kayaks, Sea Canoes	Arcata area kayak club	An association of paddlers organizing regular paddling events, promoting paddling safety and education, and exploring improvements to bay and coastal access and environment
26. Fishing Kayaks	fishingkayaks.net	6581 Bandola St., Alta Loma, CA 91737			Kayak fishing club
27. Float Tube & Kayak Fishing Network	fkpfishing.net				Fishing club
28. Friends of the Napa River	friendsofthenapariver.org	68 Coombs St., Bldg. B Napa, CA 94559		Napa area	A nonprofit community organization dedicated to the restoration, protection of the Napa River and its watershed
29. Friends of the River	friendsoftheriver.org	Friends Of The River, 915 20th Street Sacramento, CA 95814		Statewide	Statewide River Conservation Organization. Includes rafting program
30. Friends of the Trinity River	fotr.org	P.O. Box 2327 Mill Valley, CA 94942		Statewide	A nonprofit community organization dedicated to the restoration, protection of the Trinity River and its watershed
31. Full Sail Windsports Club	venturalink.net/~gibbsrus	367 Meredith Ave. Ventura, CA 93003		Ventura, Santa Barbara County area club	Kitesurfing/Windsurfing club.
32. Gold Country Paddlers	gcpaddlers.org	Gold Country Paddlers, P.O. Box 1058, Lotus, CA 95651	Kayaks (all), Rafts, Canoes	Northern California	Networking club focused on whitewater kayaking, canoeing and rafting facilitating the networking of paddlers in Northern California
33. Headwater Paddlers	n/a	1100 Main St., Fortuna, CA 95540			Local US Canoe/Kayak club
34. Heal the Bay Foundation	healthebay.org	1444 9th St., Santa Monica, CA 90401			Conservation organization focusing on Santa Monica Bay
35. He'E Nalu O'Marin Outrigger Canoe Club	heenucc.org	Larkspur, Marin County, CA	Outrigger canoes	Local club	Outrigger canoe club
36. Ho'Okahi Pu'uwai Outrigger Canoe Club	hpocc.com	Foster City Lagoon, Foster City, CA	Outrigger canoes	Local club	Outrigger canoe club

## A. Non-Motorized Boat Clubs and Organizations

### Exhibit A.1

#### Selected Non-Motorized Boating Clubs and Organizations (2006) (continued)

Page 3 of 7

Organization Name	Web Page	Location	Boat Types	Scope	General Description
37. Hui O' Hawaii of Sacramento, Inc. Outrigger Canoe Club	huiohawaiisacramento.org/Canoe.htm	Lake Natoma, Sacramento, CA.	Outrigger canoes	Local club	Outrigger canoe club
38. Hui Wa'a O San Jose Outrigger Canoe Club	n/a	Redwood City, Berkeley, and San Jose, CA	Outrigger canoes	Local club	Outrigger canoe club
39. Human Powered Vehicle Association	hpva.org	Cutten, California	All	National	National association dedicated to promoting improvement, innovation, creativity in human powered vehicles
40. Hydraulic Hooligans	hydraulicooligans.com		Kayaks, Rafts		Whitewater boating Internet group
41. Inner City Outings	sierraclub.org/ico	Several	Any	National to local	Sierra Club group providing outdoor trips for inner city youth and adults
42. International Rivers Network	irn.org	1847 Berkeley Way, Berkeley, CA 94703		International	Environmental organization which is directed at protecting rivers and opposes dams
43. Kaimanu Hawaiian Outrigger Canoe Club	kaimanu.com	San Leandro Marina, San Leandro, CA	Outrigger canoes	Local club	Outrigger canoe club
44. Kamau'i 'O Ke Kai Outrigger Canoe Club	kamaliiokekai.org	Lake Cunningham, San Jose, CA	Outrigger canoes	Local club	Outrigger canoe club
45. Kawaiulu Outrigger Canoe Club	n/a	North & South Lake Tahoe	Outrigger canoes	Local club	Outrigger canoe club
46. Kayak Fishing Association of California	kfaca.org			California	Kayak fishing club
47. Kayak Morro Bay	groups.yahoo.com/group/kayakmorrobay	Morro Bay	Kayaks	Local	Local paddling group
48. Kayak Polo Acalanes Union High School	n/a	1212 Pleasant Hill Rd., Lafayette, CA 94549		Local club	Local U.S. Canoe/Kayak club
49. Ke Kai O'Uhane Outrigger Canoe Club	kekaiouhane.org	Monterey Beach, Monterey, CA	Outrigger canoes	Local club	Outrigger canoe club
50. Kern River Alliance	kernriver.org	Bakersfield, CA	Whitewater kayaks	Local club	Supports whitewater kayaking for area youths
51. Kern Valley River Council	kvrc.org	23112 Baltar St., West Hills, CA 91304	Kayaks, Rafts, Canoes	Local club	Local U.S. Canoe/Kayak club
52. Kevsmom CA Rafting & Kayaking	kevsmom.com				Whitewater boating information
53. Kilohana Outrigger	kilohanaocc.org	Redwood City and Fremont, CA	Outrigger canoes	Local club	Outrigger canoe club
54. L Okahi Outrigger Club	lokahi.us	Petaluma River, Petaluma, CA	Outrigger canoes	Local club	Outrigger canoe club
55. La Jolla Kayak Fishing	kayak4fish.com				Kayak fishing club
56. Loma Prieta Paddlers	lomaprieta.sierraclub.org			San Jose area club part of Sierra Club	South Bay whitewater paddling club. Providing training, trips and information
57. Long Beach Dragonboat Festival	lbdragonboat.com	120 Garfield Ave., Monterey Park, CA 91754	Dragon boats	Local club	Local U.S. Canoe/Kayak club
58. Makana Hoe Outrigger Canoe Club	makanahoe.org	Folsom, CA	Outrigger canoes	Local club	Outrigger canoe club
59. Marin Canoe & Kayak Club	marincanoecub.org	Marin County	Canoes, kayaks	Local	Started over forty years ago to encourage and support canoeing

**Exhibit A.1**

**Selected Non-Motorized Boating Clubs and Organizations (2006) (continued)**

Organization Name	Web Page	Location	Boat Types	Scope	General Description
60. Masters Rowing Association	mastersrowing.org	National	Rowing	National	Supporting recreational and competitive rowing at the masters (over 40 years) level
61. Mendocino Outrigger Canoe Club	n/a	Mendocino, CA	Outrigger canoes	Local club	Outrigger canoe club
62. Miramar Beach Kayak Club	n/a	Number One Mirada Road, Half Moon Bay, CA 94019			Kayak club
63. Monterey Bay Outrigger Canoe Club	mbocc.com	Monterey Bay	Outrigger canoes	Local club	Outrigger canoe club
64. National Organization of Rivers	nors.org	212 West Cheyenne Mountain Blvd., Colorado Springs, CO 80906		National	Organization focused on the issues of navigability, river ownership, and state vs. federal control of rivers
65. Never Enough Water (N.E.W.) Kayak Club	groups.yahoo.com/group/newkayakclub	Fresno, CA		Local club	Whitewater kayak club
66. NorCal Kayak Anglers	norcalkayakanglers.com		Kayaks	Central California	Kayak fishing club
67. NorCal Slalom Racers Whitewater Slalom/Wildwater		P.O. Box 1, Mt. Hamilton, CA 95140		Local club	Local U.S. Canoe/Kayak club
68. North Bay Rowing Club	northbayrowing.org	P.O. Box 192 Petaluma, CA 94953	Sculls	San Francisco Bay area club	Rowing club
69. Northern California Outrigger Canoe Association	ncoca.com		Outrigger canoes	Local Northern California club	Outrigger canoe association with 21 local area member clubs
70. O Kalani Outrigger Canoe Club	n/a	Ballena Bay, Alameda, CA	Outrigger canoes		Outrigger canoe club
71. Ohana Wa'a Outrigger Canoe Club	n/a	Petaluma, CA	Outrigger canoes	Local club	Outrigger canoe club
72. Pacific Rivers Council	pacrivers.org	P.O. Box 10798, Eugene, OR 97440		National	Large river conservation group
73. Pacific Windsurfing	pacifcwindsurf.com			West Coast	Information site with Pacific Ocean windsurfing information
74. Paddle Wise	paddlewise.com			National	General paddling information
75. Paddling.Net	paddling.net		Kayaks, Canoes	National	Directory of clubs, manufacturers, books and how-to information
76. Penguin Paddlers	penguinpaddlers.com/missionstatement.html	Redding, CA	Kayaks	Local club	Local paddling club, primarily on lakes
77. Petaluma Paddlers	groups.yahoo.com/group/Petaluma_Paddlers	Petaluma	Kayaks, canoes	Regional	Local paddling group
78. Plastic Navy	plasticnavy.com		Kayaks		Kayak fishing organization
79. Professional Paddlesports Association	propaddle.com	7432 Alban Station Blvd., # B-232, Springfield, VA 22150	Kayaks, Canoes, Rafts	International	Trade association promoting paddlesports with search engine for locating businesses
80. Pu Pu 'O Hawai'i Outrigger Club	pupuohawaii.org	Lake Vasona & Santa Cruz, Los Gatos, CA	Outrigger canoes	Local club	Outrigger canoe club

## A. Non-Motorized Boat Clubs and Organizations

### Exhibit A.1

#### Selected Non-Motorized Boating Clubs and Organizations (2006) (continued)

Page 5 of 7

Organization Name	Web Page	Location	Boat Types	Scope	General Description
81. Qajaq USA	qajaqusa.org	National	Greenland kayaks	National	Supporting Greenland kayaking in the United States
82. Richmond Plungers	n/a	818 Channing Way, Berkeley, CA 94710		Local club	Local chapter of U.S. Canoe/Kayak organization
83. Rio Vista Windsurf Association	rvwa.com	P.O. Box 547 Rio Vista, CA 94571		Delta area club	Local area windsurfers and kiteboarders association
84. River City Paddlers	groups.yahoo.com/group/rivercitypaddlers		Kayaks, Canoes	Sacramento area club	Local area paddler web-based group
85. River City Whitewater Club	rcwconline.com	Sacramento		Sacramento area club	Whitewater rafting club
86. River Management Society	river-management.org	P.O. Box 9048 Missoula, MT 59807		National	Nonprofit organization for professionals who study, protect, and manage North America's rivers, with nationwide chapters (4 in CA)
87. River Touring Section, Angeles Chapter Sierra Club	angeles.sierraclub.org/rts	Los Angeles, CA		Los Angeles-area club that is part of the Sierra Club	Sierra Club sub organization for canoe and kayak trips on lakes and rivers and some sea kayak trips in the Los Angeles area and in Morro Bay
88. River Tree Volunteers		Fresno area	Any	Regional	Supports river clean-ups and other activities in Fresno area
89. San Diego Kayak Club	sdkc.org	c/o Gilbert Siegel 14244 Primrose Ct., Poway, CA 92064	Kayaks, Canoes, Rafts	San Diego club	Social club organizing social paddling trips at all skills levels.
90. San Diego Dragonboat Team	sddragonboat.com	5998 Alcalá Park, Unit 666, San Diego, CA 92110	Dragon boats	Local club	Local U.S. Canoe/Kayak club
91. San Diego Kayaking Meetup Group	kayaking.meetup.com/121/?g=sj7		Kayaks	Local San Diego Internet club	Kayak Meetup club
92. San Diego Paddling Club	n/a	1829 Chalcedony St., San Diego, CA 92109		Local club	
93. San Diego Windsurfing Association	sdwa.org	San Diego	Sailboards	Local	Events and information for San Diego are windsurfing
94. San Francisco Bay Chapter of the Sierra Club River Touring Section (RTS)	sanfranciscobay.sierraclub.org/rivertouring	5960 South Land Park Dr., #117, Sacramento, CA 95822		Local chapters of National Organization	Club sponsoring river and flat water trips. Bay Area Chapter of Sierra Club also has eight local groups focused on environmental issues
95. San Francisco Boardsailing Association	sfba.org	1592 Union Street, Box 301, San Francisco, CA 94123		Local club	Boardsailing Volunteer Social Association with North Bay, San Francisco, East Bay and Peninsula chapters
96. San Francisco Outrigger Canoe Club	mindspring.com/~siais/index.html	The Sportsbasement, Crissy Field/ SF Presidio, San Francisco, CA	Outrigger canoes	Local club	Outrigger canoe club
97. Santa Cruz Kayak Club	n/a		Kayaks		Area paddling club
98. Santa Cruz Kayak Fishing	santacruzkyakfishing.com		Kayaks	Local club	Kayak fishing club
99. Santa Cruz Outrigger Canoe Club	santacruzoutrigger.org	Santa Cruz Harbor, Santa Cruz, CA	Outrigger canoes	Local club	Outrigger canoe social club

Exhibit A.1

Selected Non-Motorized Boating Clubs and Organizations (2006) (continued)

Organization Name	Web Page	Location	Boat Types	Scope	General Description
100. Santa Cruz Rowing Club	scrowing.org			Santa Cruz club	Rowing Club
101. Sequoia Paddling Club	sequoiapc.org	P.O. Box 2881 Guerneville, CA 95446	Kayaks, Rafts, Canoes	Santa Rosa area club	Sierra Club Sectional Redwood Chapter Club for promotion of paddlesports and waterway conservation
102. Shared Adventures	sharedadventures.org	90 Grandview St., B101, Santa Cruz, CA 95060	Rafts, Sailboats	Santa Cruz club	A non-profit organization dedicated to improving the quality of life of people living with disabilities
103. Sierra Nevada Whitewater Club		Reno, Nevada	Whitewater boats	Regional	Recreational club for whitewater boaters
104. Sierra Sea Kayakers	groups.yahoo.com/group/SierraSeaKayakers	Sacramento			
105. Smith River Alliance	smithriveralliance.org	Crescent City	Any	Regional	Conservation organization for the Smith River
106. SOTO Recreational Kayak Club	n/a	2333 Camino Del Rio S., #230, San Diego, CA 92108			
107. South Yuba River Citizen's League	syrccl.org	216 Main St., Nevada City, CA 95959			The South Yuba River Citizens League is a community-based educational nonprofit corporation for the protection, preservation and restoration of the entire Yuba Watershed
108. Southern California Outrigger Racing Association	socaloutrigger.org	Southern California	Outrigger canoes	Regional	Governing organization for outrigger canoe racing in Southern California
109. Southern California Surf Kayakers	groups.yahoo.com/group/southern-california-surf-kayakers	Southern California	Kayaks	Los Angeles area Internet surf club	A loose knit group of paddle surfers in Southern California. Group has no memberships, no dues, no meetings and no attitudes
110. Stanford Kayak Club	stanford.edu/group/KayakClub		Kayaks	Local club	Kayak club
111. Stanford Canoe and Kayak Team	stanford.edu/group/sck	3 Dana Point Cir., Redwood Shores, CA 94065	Kayaks, Canoes	Local club	Local chapter of U.S. Canoe/Kayak organization
112. Surfrider Foundation	surfrider.org			National	Conservation organization
113. Tamalpais Outrigger Canoe Club	geocities.com/paddletam	Horseshoe Cove, Sausalito, CA	Outrigger canoes	Local club	Outrigger canoe club
114. The El Toro International Yacht Racing Association	eltoroyra.org	El Toro Assn, 1014 Hopper Ave., #419, Santa Rosa, CA 95403	One-person yachts	San Francisco Bay area organization	Club for one person yacht sailors providing plans, training and events for members
115. Trade Association of Paddlesports	gopaddle.org				Website for locating paddlesport suppliers
116. Traditional Small Craft Association	tsca.net	Connecticut	Historical non-motorized boats	National	Supports boats used for work and recreation before advent of gasoline motors
117. Tuolumne River Preservation Trust	tuolumne.org/content	San Francisco, Modesto, Sonora	Any	Regional	Conservation organization for Tuolumne River and tributaries
118. UCLA Kayak Polo Club	www.studentgroups.ucla.edu/kayakpolo		Kayaks	University local club	University club dedicated to the sport of kayak polo (canoe polo)
119. United Anglers of Southern California	unitedanglers.com	17391 Murphy Ave., Irvine, CA 92614		Southern California	Conservation organization

## A. Non-Motorized Boat Clubs and Organizations

### Exhibit A.1

#### Selected Non-Motorized Boating Clubs and Organizations (2006) (continued)

Page 7 of 7

Organization Name	Web Page	Location	Boat Types	Scope	General Description
120. U.S. Academy of Canoeing and Kayaking	n/a	12209 Santa Paula Ojai Road, Ojai, CA 92023			Local chapter of U.S. Canoe/Kayak organization
121. U.S. Canoe/Kayak	usack.org	301 South Tryon St., Suite 1750 Charlotte, NC 28282	Kayaks, Rafts, Canoes	National	Membership club for anyone with an interest in competitive paddlesports
122. U.S. Rowing	usrowing.org	2 Wall St. Princeton, NJ 08540		National	Governing organization for all U.S. rowing classes and contests with 1,000 local area clubs
123. U.S. Windsurfing	uswindsurfing.org	P.O. Box 99 Chelsea, MI 48118		National	Volunteer organization for windsurfers
124. Valley Wide Kayak Club	valleywidekayakclub.org	42100 Walters Road, Hemet, CA 92544		Southern California area club	Southern California kayak club
125. Wave Chaser Paddle Series	wavechaser.com	San Francisco Bay Area	Outriggers, surfskis, kayaks, paddleboards	Regional	Northern California winter racing organization
126. Western USA Waveski Association	members.aol.com/waveskier2/webpage/westwave.html		Kayaks, Surfboards	Southern California area club	Small internet club dedicated to advancing waveskiing
127. Western Rivers Conservancy	westernrivers.org	313 N. Main St., Suite C, Sebastopol, CA 95472		Regional	Conservation organization
128. Western Sea Kayakers	westernseakayakers.org	P.O. Box 1531 Mountain View, CA 94042-1531	Kayaks	San Jose area club	A sea kayaking club
129. Western Waters Canoe Club	westernwaterscanoeclub.org		Canoes		A open boat paddlers club
130. Women on Water	uswindsurfing.org/WOW/WOWhome.htm				San Francisco women's windsurfing and kitesurfing association

**Exhibit A.2**  
**California Rowing Clubs (Member of US Rowing) (2006)**

Organization Name	Location	Web Page
1. Bair Island Aquatic Center (BIAC)	Redwood City, Calif.	gobair.org
2. Berkeley Crew	Oakland, Calif.	calbears.com
3. Berkeley Crew	Berkeley, Calif.	berkeleyhighcrew.org
4. Berkeley Rowing Club	Oakland, Calif.	n/a
5. Blue Blades Rowing Club	Venice, Calif.	n/a
6. California Rowing Club	Oakland, Calif.	n/a
7. California Yacht Club	Westchester, Calif.	calyachtclub.com
8. Capital Crew Boosters Club	Fair Oaks, Calif.	capitalcrew.com
9. Chapman University	Orange, Calif.	n/a
10. Claremont College Rowing Club	Claremont, Calif.	n/a
11. Clear Lake Scullers	Kelseyville, Calif.	n/a
12. Crystal Middle School Rowing Club	Suisun City, Calif.	n/a
13. CSUS/CSUS Aquatic Center/Lake Natoma/Capital Crew	Rancho Cordova, Calif.	n/a
14. Delta Blades	Stockton, Calif.	n/a
15. Dolphin Club	San Francisco, Calif.	dolphinclub.org
16. Embarcadero Rowing Club	San Francisco, Calif.	n/a
17. Four Score & Four Rowing Club	San Francisco, Calif.	keyprincipalpartners.com
18. Friends of California Men's Crew	Oakland, Calif.	n/a
19. Humboldt Bay Rowing Association	Trinidad, Calif.	n/a
20. Humboldt State University	Arcata, Calif.	n/a
21. Jack London Aquatic Center, Inc.	Oakland, Calif.	n/a
22. Junipero Serra High School	San Mateo, Calif.	serrahs.com
23. Kent Mitchell Rowing Club	Palo Alto, Calif.	n/a
24. Lake Merritt Rowing Club	Oakland, Calif.	rowlakemerritt.org
25. Lions Rowing Club	Los Angeles, Calif.	n/a
26. Long Beach Junior Crew	Long Beach, Calif.	n/a
27. Long Beach Rowing Association	Long Beach, Calif.	longbeachrowing.org
28. Los Angeles Rowing Club	Marina Del Rey, Calif.	n/a
29. Los Gatos Rowing Club	Pacifica, Calif.	lgrc.org
30. Loyola Marymount University Crew	Los Angeles, Calif.	lmulions.com
31. Marin Master Men Rowing	San Geronimo, Calif.	n/a
32. Marin Rowing Association	Greenbrae, Calif.	marinrowing.org
33. Marina Aquatic Center	Marina del Rey, Calif.	macrowing.org
34. Newport Aquatic Center	Newport Beach, Calif.	newportaquaticcenter.com

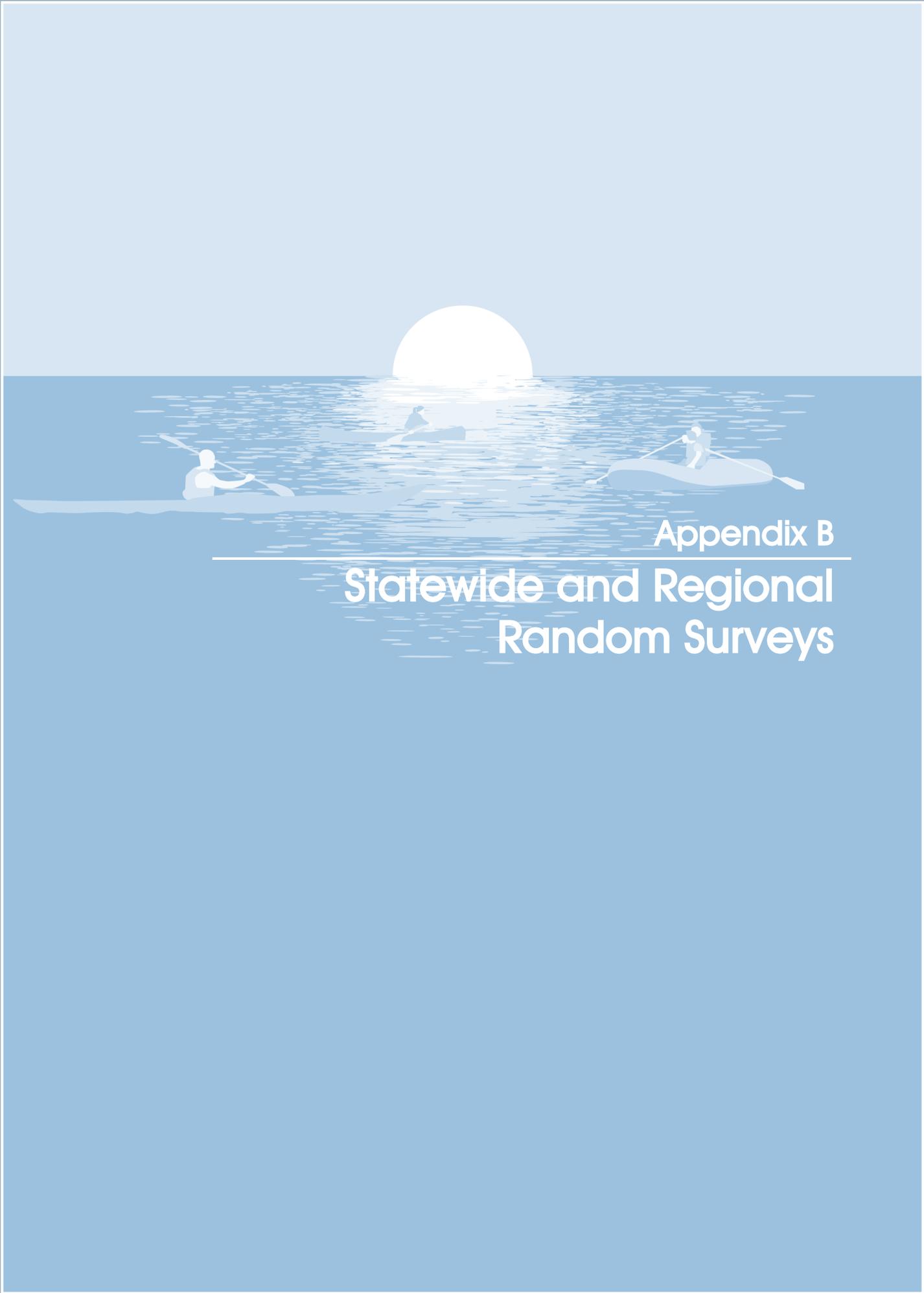
## A. Non-Motorized Boat Clubs and Organizations

### Exhibit A.2

#### California Rowing Clubs (Member of US Rowing) (2006) (continued)

Page 2 of 2

Organization Name	Location	Web Page
35. North Bay Rowing Club	Petaluma, Calif.	northbayrowing.org
36. Northern California Crew / NORCAL	Menlo Park, Calif.	norcalcrew.org
37. Oakland Strokes, Inc.	Oakland, Calif.	oaklandstrokes.org
38. Open Water Rowing Center	Sausalito, Calif.	owrc.com
39. Orange Coast College	Newport Beach, Calif.	coast-crew.org
40. Pacific Rowing Club	Daly City, Calif.	pacifirc.org
41. Palo Alto High School Crew	Los Altos, Calif.	n/a
42. Palo Alto Rowing Club	Los Altos Hills, Calif.	n/a
43. Peninsula Aquatic Center Junior Crew	Redwood City, Calif.	peninsulajuniorcrew.org
44. River City Rowing Club	West Sacramento, Calif.	rivercityrowing.org
45. Sacramento State Women's Rowing	Sacramento, Calif.	hornetsports.com
46. San Diego Crew Classic	San Diego, Calif.	crewclassic.org
47. San Diego Rowing Club	San Diego, Calif.	sdrc-row.org
48. San Diego State University Women	San Diego, Calif.	n/a
49. San Francisco Bay Blades	Palo Alto, Calif.	n/a
50. Santa Clara University Crew	Santa Clara, Calif.	<a href="http://santaclarabroncos.fansonly.com/sports/c-crew/sacl-c-crew-body.html">http://santaclarabroncos.fansonly.com/sports/c-crew/sacl-c-crew-body.html</a>
51. Santa Cruz Rowing Club	Santa Cruz, Calif.	scrowing.org
52. Sonoma Sculling Society	Healdsburg, Calif.	n/a
53. Sonoma State Rowing Club	Rohnert Park, Calif.	sonoma.edu/clubs/crew
54. St. Ignatius Crew - San Francisco	San Francisco, Calif.	n/a
55. Stanford Rowing Center	Redwood City, Calif.	n/a
56. Stanford University Men's Crew	Stanford, Calif.	n/a
57. Stanford University Women's Crew	Stanford, Calif.	gostanford.edu
58. Stockton Rowing Club	Stockton, Calif.	stocktonrowing.com
59. Trident Rowing Club	Carlsbad, Calif.	n/a
60. UCLA Women's Rowing	Los Angeles, Calif.	uclabruins.com
61. United Marina Rowing Association	Los Angeles, Calif.	n/a
62. University of California - Davis Men's Crew	Davis, Calif.	ucdcrew.org
63. University of California - San Diego Crew	La Jolla, Calif.	<a href="http://athletics.ucsd.edu">http://athletics.ucsd.edu</a>
64. University of California - Santa Barbara	Santa Barbara, Calif.	par.ucsb.edu/recsports/sportclubs/rowing
65. University of California Berkeley Lightweight Rowing	Mill Valley, Calif.	cal-lightweights.org
66. University of San Diego Women's Rowing	San Diego, Calif.	n/a
67. University of Southern California	Los Angeles, Calif.	usctrojans.ocsn.com
68. ZLAC Rowing Club, LTD	San Diego, Calif.	zlac.com



Appendix B

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# Statewide and Regional Random Surveys

A vertical blue sidebar on the left side of the page features a white illustration of a sunset over the ocean. The sun is a large white circle on the horizon, with its light reflecting on the water. Below the horizon, three people are shown in silhouette, each in a different type of non-motorized boat (a small kayak, a larger canoe, and another kayak), paddling across the water.

## B. Statewide and Regional Random Surveys

The statewide and regional surveys were telephone surveys of randomly selected California households. These telephone surveys were conducted by Quantum Market Research (QMR), of Oakland, California. The surveys were performed between November 2006 and April 2007.

This Appendix includes the following statewide and regional random survey information:

- A description of the statewide and regional survey approaches
- A presentation of the statewide and regional survey analyses
- A paper version of the telephone questionnaire (the actual survey was implemented using a Computer Aided Telephone Interview system), **Exhibit B.1**
- A seven-page exhibit, **Exhibit B.2**, that provides calculations for incidence rates, number of households owning boats, participants, and number of boats by boat type
- A one-page exhibit, **Exhibit B.3**, that provides summary results of fourteen survey questions.

### Statewide and Regional Random Survey Approaches

The statewide and regional random telephone surveys of 474 households that own one or more non-motorized boats utilized a “listed household” sample frame. As described below, the listed household approach has many benefits as compared to random digit dialing. The following description is based on materials provided by GENESYS Sampling Systems, the company that provided the sample data to Quantum Market Research (QMR). QMR performed the random telephone surveys.

#### Listed Household Sample Frames

In the market research industry, the term “listed household” usually refers to a sample frame comprised of **residential** telephone numbers derived from the “white pages” in the telephone directory. There are two companies nationally that compile white page directories, Donnelley Marketing and InfoBase. Essentially all white page-based consumer telephone lists originally come from one of these two sources. GENESYS purchased listed household telephone numbers from Donnelley Marketing.

The original white pages data includes name (as listed in the telephone book), telephone number, address (where listed), and a telephone book identification code (identifying the book the data originated from). In addition, the companies assign a geographic code to each record. This is straightforward in those cases where the address is listed, as the exact zip code can be identified. However, for listings without

an address, there is standard protocol that uses exact and modeled data to determine the zip codes for these listings. Geographic data at the county level and above is very accurate using this methodology, with accuracy rates above 80 percent. Geographic data at more refined levels, such as zip codes or census tracts, is less accurate. For the regional component of the survey, we utilized data at the county level.

Beyond this point, all white page-based consumer telephone lists are not the same. Individual companies purchase the original white page numbers from Donnelly or InfoBase, and then further enhance the data in various ways, such as merging the data with automobile registrations; drivers license data; voter registrations; birth records; survey respondents; coupon redemption information; direct mail donors; mail order buyers; books and merchandise purchases; and proprietary data sources. Thus, the basic white page information can be enhanced to include both geographic and demographic data about a household, with varying levels of accuracy. For example, household income data associated with a particular household listing is typically modeled, and thus may be only 70 percent to 80 percent accurate. A final set of listed household data will include the basic telephone contact information, as well as geographic and demographic data.

An important component of listed household samples is maintaining the list. Each year, the compilation process involves a record-by-record review of each new telephone directory versus the existing information in the database. This process takes from two to four months. Furthermore, the sheer size of a listed household database requires ongoing maintenance in order to ensure that each record still represents an active household, as well as to verify the continuing accuracy of the record's information. On a monthly basis, the entire list is compared to, and corrected by, the National Change of Address file. In addition, maintenance includes compilation of new directories, aging of

respondents, unduplicating of telephone numbers, and remodeling of record information based on new Census data. An updated listed telephone number sample frame should return 80 percent to 90 percent households.

### Benefits of Listed Household Sample Frames

Listed household data can significantly reduce inefficiencies in sampling. A listed household sample frame eliminates a large number of invalid telephone numbers such as fax lines, businesses, disconnected numbers, and elevator telephones. This is in contrast to a sample frame of randomly generated telephone numbers (random digit dialing, RDD). Invalid telephone numbers can make up a significant component of the total numbers in a RDD sample. Calling a large number of invalid numbers adds greatly to the time and expense of a random telephone survey.

By utilizing a listed household sample frame, we eliminated the first source of invalid numbers at the front end, and thus reduced the total number of calls necessary to obtain 474 completed surveys. Listed household samples are particularly beneficial in a survey, such as the statewide and regional random surveys of non-motorized boating, in which the incidence rate is very low. For the statewide and regional random surveys, the incidence rate refers to the percent of respondents (households) that actually own a non-motorized boat. For surveys with a low incidence rate, it takes a large number of telephone calls to obtain the required number of completed surveys.

At the start of the survey, we estimated that approximately twelve (12) percent of California households would own a non-motorized boat. Based on this assumption, we would need to contact and actually query approximately 4,000 households whether or not they owned a non-

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motorized boat. Actually getting in contact with 4,000 households required dialing significantly more telephone numbers to account for answering machines, hang ups, non-answers, etc. The listed household list assures, with over 80 percent accuracy, that at least the number called is a residential household.

To conduct the statewide random survey, we initially purchased 30,000 listed household numbers. As it became clear that the incidence rate was much lower than the original assumption of twelve (12) percent, we purchased an additional 10,000 listed household numbers. Approximately 25,000 numbers were selected randomly statewide, and approximately 15,000 numbers were selected randomly amongst the ten regions. Each listed household in the sample frame was contacted up to six (6) times. This high rate of follow-up helped ensure that each household contacted was truly random.

The actual number of households contacted, and willing to answer the screening question (to determine if they owned a non-motorized boat) was 5,451. These 5,451 households represent 13.6 percent of the total sample frame. The remaining 34,549 telephone numbers either refused to answer the survey, were answering machines, were disconnected numbers, were businesses, did not pick up the telephone, or did not speak English.

## Telephone Interview Approach

The statewide random survey was conducted by telephone, using a Computer Aided Telephone Interview (CATI) system. After we developed a paper-version of the survey, QMR converted the survey to the CATI system, with automatic links to questions based on “yes” or “no” answers. (For example, skipping questions on the second or third boat type if the respondent has only one boat type.) After the surveyor identified whether the respondent had non-motorized boat(s), they ensured that they

were speaking to the person most qualified to answer non-motorized boating questions. If necessary, the surveyor set up a time to call back and speak to the non-motorized boater in the household.

QMR programmed the CATI system to incorporate previous answers into future questions. For example, if the respondent said they had an inflatable canoe, the surveyor would read later questions as: “How often do you use your inflatable canoe?” rather than, “How often do you use this non-motorized boat type?”

Some respondents had multiple types of non-motorized boats and used multiple waterways. Our approach was to first identify *all* of the non-motorized boats. For those respondents with multiple types of boats, we then identified the most-used boat type (whitewater kayak, inflatable canoe, etc.). We then asked questions about how often that boat type was used, two waterways where it was used, and facility needs for those two waterways. Surveyors gathered information on two waterways that the boater used, and one waterway that the boater avoided using but would have liked to use.<sup>a</sup> Following the waterway and facility questions, we asked a series of general, expenditure, and demographic questions.

We included an open-ended question for comments or suggestions at the survey end. This open-ended question provided respondents with a chance to voice their own opinions. We synthesized much of this qualitative survey input into the facility needs analysis (Section 3).

The telephone survey took approximately 15 minutes. The survey was significantly shorter for a respondent that had not used their boat within the last five years, and longer for an active non-motorized boater that wanted to discuss the topic.

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<sup>a</sup> Due to survey time constraints, we were limited to asking respondents about only their two most used waterways. Thus, usage data for specific waterways were conservative. As a result, we provided relative ranking of waterways in Section 3, combining data from random and active-user surveys, commercial surveys, and interest group meetings.

### Quality Control Procedures

The statewide random survey included a high degree of training and quality control steps to ensure validity of the survey. Prior to developing the survey, NewPoint Group, in consultation with DBW, spent a significant amount of time developing the definition of non-motorized boats, for both the survey and the project overall. This definition of non-motorized boats was carefully, and repeatedly, communicated to QMR supervisors and surveyors.

NewPoint Group prepared a picture glossary of included non-motorized boats, as well as “boats” that were excluded from the survey. The picture glossary included several pages and pictures of each category of non-motorized boat, and one page with pictures of excluded items, such as toy rafts.

To ensure that surveyors were knowledgeable about non-motorized boating in general, and our definitions of non-motorized boats in particular, NewPoint Group participated in a three-hour surveyor training session at QMR offices in Oakland. During this training we provided a boat-by-boat description of included and excluded vessels, using the picture glossary as a guide. In addition to attending the training and being provided an on-screen presentation on boat definitions, each surveyor was given a hard copy of the picture glossary. Furthermore, the training session included a question-by-question reading and discussion of the survey.

There was a substantial degree of quality control during the telephone survey itself to ensure that surveyors were asking questions correctly, and clarifying responses with respondents when necessary. During initial survey interviews, NewPoint Group anonymously listened to selected non-motorized boat-owner surveys to ensure that the surveyors were correctly interpreting survey questions and responses.

NewPoint Group provided constructive feedback to QMR on this early project juncture to clarify boat types that should be included and excluded in the survey. One or more QMR supervisors was on-site during all telephone interviews, and listened to the surveys, both in-person, and through the QMR computer aided telephone interview system. In addition, because the incidence rate of non-motorized boat ownership was so low (and thus there were very few completed surveys on any given night), QMR supervisors were able to closely monitor surveys as they were in progress. As a final quality control step, NewPoint Group reviewed survey responses at several interim points during the survey, and after the survey was completed. During these interim reviews we identified and removed survey responses that were not for non-motorized boats, such as one respondent that identified their second type of non-motorized boat as a fisherman float tube.

Finally, in regards to the survey methodology, it is worth noting that if a respondent was willing to spend fifteen or more minutes on the telephone answering questions about how many non-motorized boats they own, where they use them, why they use them, and how much they spend on boating, they likely owned a “real” non-motorized boat, and not a “toy”. We believe the statewide random survey responses of non-motorized boaters support this perception.

### Statewide and Regional Survey Components

The survey included a statewide random component and a regional random component. Because each region was a unique subpopulation of the State, the 351 completed statewide random surveys were analyzed at both the statewide and regional level. QMR completed an additional 123 random regional surveys in order to achieve a minimum of 25 completed surveys per region.

We utilized this blended state and regional approach to maximize the statistical accuracy of information obtained at the statewide level, while providing reasonable coverage at the regional level. This was particularly important, because no such survey of non-motorized boat owners had been previously conducted in California, or elsewhere in the United States.

This research study had little prior information upon which to predict the number of households that own non-motorized boats. The statewide random telephone survey of 351 non-motorized boat owning households provided the basis for estimating the statewide incidence rate (percent of households owning non-motorized boats), the number of non-motorized boats owned by individuals, and the number of non-motorized boating participants in non-motorized boat owning households. Because this statewide data was more accurate than the regional data, we adjusted the regional totals to match the statewide totals.

Statistically, we could count each completed statewide random survey as a valid random regional survey.<sup>b</sup> That is, we could double-count each survey (once for the State and once for the region) without losing any statistical power. In fact, this statistical characteristic of subpopulations, enhanced the statistical power of the statewide survey.

We analyzed the data, including incidence rates, and developed population estimates at the statewide level, and subpopulation estimates at the regional level.

<sup>b</sup> Pages 62 to 63 in Cochran's *Sampling Techniques* (John Wiley and Sons, 1977) discusses estimating proportions and totals over subpopulations. In our study, each region was a subpopulation of the overall statewide population. With only minor adjustments to the equations used for the population estimates, one could calculate estimates of mean, variance, and standard error for each subpopulation.

## Confidence Intervals of Statewide and Regional Incidence Rates

The incidence rate of non-motorized boat ownership was the key calculation resulting from the statewide and regional random telephone survey of non-motorized boating household. The incidence rate is the percent of households that own one, or more, non-motorized boats. Once an interviewer made telephone contact with a household, they asked a screening question to determine whether anyone in the household owned a non-motorized boat. If the household did own a non-motorized boat, the interviewer continued with the full survey. If the household did not own a non-motorized boat, the interview was terminated.

The incidence rate of non-motorized boat ownership was equal to:

$$\frac{\text{Number of households owning a non-motorized boat (NMB)}}{\text{Number of households owning a NMB} + \text{Number of households not owning a NMB}}$$

For the incidence rates calculation, the sample size,  $n$ , was equal to the denominator. The denominator was the number of households owning, and not owning, non-motorized boats. In determining the incidence rate, the sample size was not the number of respondents owning a boat (the number of completed surveys), but the number of households that were contacted and answered the screening question. This was because the incidence rate calculation requires us to know the number of “do not own a non-motorized boat” (or did not qualify) responses, in addition to the number of “do own a non-motorized boat” responses. This large sample size,  $n$ , results in an improvement of statistical accuracy for the incidence rate calculations, as compared to results of survey questions, such as days of boating per year, that are based only on the number of completed surveys of households owning a non-motorized boat.

**Table B.1**  
**Statewide and Regional Random Telephone Survey Incidence Rates**  
**and Margin of Errors at a 95 Percent Confidence Interval (2006)**

Survey Area	Completed Surveys	Total Survey Contacts (n)	Incidence Rate	Standard Deviation of Incidence Rate	Relative Margin of Error at a 95 percent Confidence Interval
Statewide Random Survey	351	4,475	7.84%	0.40%	10.05%
Regional Random Survey					
1. North Coast	46	239	19.25%	2.55%	25.97%
2. San Francisco	67	1,021	6.56%	0.77%	23.15%
3. Central Coast	33	238	13.87%	2.24%	31.66%
4. South Coast	67	1,375	4.87%	0.58%	23.36%
5. San Diego	26	345	7.54%	1.42%	36.95%
6. Northern Interior	49	206	23.79%	2.96%	24.44%
7. Sacramento Basin	87	551	15.79%	1.55%	19.28%
8. Central Valley	39	508	7.68%	1.18%	30.15%
9. Eastern Sierra	35	174	20.11%	3.02%	29.62%
10. Southern Interior	25	794	3.15%	0.62%	38.57%
<b>Total</b>	<b>474</b>	<b>5,451</b>			

Because the statewide and regional random telephone surveys reflected a true random sample of households in California, we could extrapolate the results of the surveys to the population of California households overall. We applied statistical tools to estimate the level of accuracy in applying our survey results to the statewide and regional populations.

The survey design was originally intended to achieve a 5 percent relative margin of error at the 95 percent confidence interval at the statewide level for the incidence rate calculation. The actual relative margin of error at the 95 percent confidence interval at the statewide level for the incidence rate calculation was 10.05 percent. The margin of error was higher than expected at the statewide level, and also high at the regional level, as shown in **Table B.1**, above.

A 10.05 percent relative margin of error at the 95 percent confidence level means that the

probability is 95 percent that the actual statewide incidence rate falls within +/- 10.05 percent of 7.84 percent, i.e., that the actual statewide incidence rate is between 7.05 percent, and 8.63 percent.

This relative margin of error is driven, primarily, by sample size. There is a statistical “rule of thumb” that states that for a proportion (yes/no) question, the maximum margin of error at the 95 percent confidence level,  $e$ , is equal to  $1/\sqrt{n}$ , where  $n$  is the sample size.<sup>c</sup> Thus, for any given sample size, one can estimate the approximate margin of error at the 95 percent confidence level. Conversely, for a desired error rate, one can estimate the necessary sample size,  $n = 1/e^2$ . Using these equations, a sample size of 400 should result in a margin of error of approximately 5 percent at the 95 percent confidence level. It is important to note that this

<sup>c</sup> This rule is provided in Cochran, *Sampling Techniques*, pages 72-73 (1977). The maximum error rate is based on a proportion in which both  $p$  and  $q$  are equal to 50 percent, the case that results in the largest value of  $p \times q$ , and thus the highest error rate.

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statistical estimator provides an absolute margin of error, not a relative margin of error.

The difference between absolute and relative margins of error is more complicated in the case of proportions, because both figures are percentages. In many cases, survey results do not distinguish between relative and absolute margins of error. The relative margin of error depends on the proportion in question. For example, if one is considering a question in which 65 percent of 400 survey respondents answered “yes”, the absolute margin of error at the 95 percent confidence level would be approximately 5 percent ( $1/\sqrt{400}$ ), but the relative margin of error at the 95 percent confidence level would be  $5/65$ , or 7.7 percent. This means that the probability is 95 percent that the actual result falls within  $\pm 7.7$  percent of 65 percent, or between 60 percent and 70 percent.

The sample size for the incidence rate calculation, of 4,475, would be more than sufficient to achieve a 5 percent relative margin of error at the 95 percent confidence level under reasonable assumptions. In fact, the maximum absolute margin of error, given a sample size of 4,475 is equal to  $1/\sqrt{4,475}$ , or 1.5 percent. However, because the incidence rate was extremely small (about one-half of the 12 percent that we initially projected), the relative error rate was higher, at 10 percent.

The relative margin of error is equal to the absolute margin of error, divided by the incidence rate. Because the sample size is so large, the absolute actual margin of error for the statewide incidence rate is very low, 0.79 percent. However, when compared to the very low incidence rate of 7.84 percent, the relative margin of error is higher.

This much lower than expected incidence rate of non-motorized boat ownership means that it would not have been economically feasible, or reasonable, to achieve a 5 percent relative margin of error at the 95 percent confidence level for the

statewide random survey. Achieving such an error rate would have required a sample size of 18,000 households. By comparison, most national telephone polling surveys are based on maximum sample sizes of between 1,000 and 5,000. There are two reasons why sample sizes typically are not any higher: (1) the high cost of completing each survey; and (2) the fact that there are diminishing returns for improved statistical accuracy once the sample size increases beyond several thousand.

The relative margin of error for the statewide incidence rate can be improved somewhat by calculating the margin of error at the 85 percent confidence level, rather than the 95 percent confidence level. This is a lower statistical standard. The probability is 85 percent that the actual statewide incidence rate falls within  $\pm 7.5$  percent of 7.84 percent, i.e. that the actual statewide incidence rate is between 7.25 percent, and 8.43 percent. The margin of error at 85 percent provides a smaller range for the incidence rate; however, we are slightly less certain that the actual value falls within this range.

The margins of error at the 95 percent confidence interval for the regional incidence rate calculations are much higher than the margin of error for the statewide incidence rate. This was because: (1) the sample size,  $n$ , for each region was much lower than the statewide sample size (between 174 and 1,375); and (2) for many regions the incidence rate was even lower, resulting in a lower denominator for the calculation of the relative margin of error.

Thus, even in a region with a relatively large sample size, such as the South Coast region, the low incidence rate of 4.87 percent resulted in a high margin of error of 23.4 percent. What this means for the South Coast region is: there is a probability of 95 percent that the actual South Coast region incidence rate falls within  $\pm 23.4$  percent of 4.87 percent, i.e., that the actual South Coast incidence rate is between 3.73 percent, and 6.01 percent.

**Table B.2**  
**Statewide Random Telephone Survey Boat Type Incidence Rates and Margin of Errors**  
**at a 95 Percent Confidence Interval (2006)**

Boat Type	Survey Number of Households (n=4,475)	Survey Number of Boats	Percent of Boats	Estimated Statewide Number of Boats	Household Incidence Rate	Boats per Household by Type	Standard Deviation of Incidence Rate	Relative Margin of Error at a 95 percent Confidence Interval, Incidence Rate
Statewide Random Survey Total	351	616	100.0%	1,696,987	7.84%	1.75	0.40%	10.05%
a. Boats Utilized 5 Days or More per Year								
1. Kayak	109	171	27.76%	471,084	2.44%	1.57	0.23%	18.53%
2. Inflatable*	112	151	24.51%	415,931	2.50%	1.35	0.23%	18.30%
3. Canoe	41	45	7.30%	123,880	0.92%	1.10	0.14%	30.41%
4. Rowing Boat	30	34	5.52%	93,674	0.67%	1.13	0.12%	35.67%
5. Sailboard/Kiteboard	10	16	2.60%	44,122	0.22%	1.60	0.07%	62.40%
6. Small Sailboat**	7	7	1.14%	19,345	0.16%	1.00	0.06%	73.19%
7. Other	3	3	0.49%	8,315	0.07%	1.00	0.04%	110.70%
8. Combined Boats #4 to #7	50	60	9.74%	165,456	1.12%	1.20	0.16%	27.53%
b. Boats Utilized 1 to 4 Days per Year	82	109	17.69%	300,197	1.83%	1.33	0.20%	21.46%
c. Boats Not Utilized Within Last 5 Years	63	80	12.99%	220,439	1.41%	1.27	0.18%	24.50%
<b>Total</b>		<b>616</b>	<b>100.00%</b>	<b>1,696,987</b>				

\* For purposes of this study, the “inflatable” category includes inflatable rafts, catarafts, and transoms. Inflatable kayaks are included in the “kayak” category.

\*\* Many boaters consider any sailboat that they store at home, and load on their car, as a “small sailboat”, even if the sailboat is longer than 8 feet in length. This estimate of small sailboats includes a significant number of these longer small sailboats.

Table B.2, above, provides the margins of error at the 95 percent confidence interval for the boat type incidence rate calculations. As Table B.2 illustrates, these error rates are much higher than the margin of error for the statewide incidence rate, and are increasingly higher as the incidence rates for particular boat types decrease. Some of these relative error rates are high due to the extremely low incidence rates (between 0.07 percent and 2.50 percent) for boat types.

One can see that we have less statistical confidence in the regional and boat type survey results than the statewide results. Wherever

possible, the reader should focus primarily on the statewide level survey results.

The regional survey results should be interpreted as relative estimates in that the regional results are relatively accurate across regions, and in relative comparison to the statewide totals, even though there were greater margin of errors in the regional results. As a regional comfort factor, the sum of the estimated number of non-motorized boat owning households in each region was less than 10 percent different than the estimated number of non-motorized boat owning households at the much more accurate statewide level.

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Like the regional survey results, the boat type results should be interpreted as relative order-of-magnitude estimates, in that the sum of these boat type estimates are relatively accurate across the state, for boats owned by boat owners that utilized their boat(s) five or more times per year. The fact that the number of boats by boat type estimates calculated by two different methodologies sum to within less than 1 percent of the statewide estimate improves one's confidence in these estimates, even if the relative error rates are high.

We have a moderate degree of confidence for boat type estimates for the two more common boat types (kayaks and inflatable boats), and lower confidence in boat type estimates for each of the other five boat type categories. However, when we combine categories, we have moderate confidence that the total number of regularly used rowing boats, sailboards, kiteboards, small sailboats, and other non-motorized boats is approximately 165,000.

The regional and boat specific results illustrate that providing boat type estimates at the regional level would have required disaggregating the survey results into such small numbers – for example, three respondents in the Sacramento Basin owning a sailboard or kiteboard – that there would be little statistical validity in extrapolating to a regional population. Our approach was to provide those estimates for which we had a moderate (or high) statistical confidence.

## Statewide and Regional Survey Analyses

Exhibit B.2 and Exhibit B.3, following Exhibit B.1, provide summary calculations and results for the statewide and regional random surveys.

Exhibit B.2 provides the series of calculations illustrating the estimates for number of households owning non-motorized boats statewide (969,707), and by region. Once we estimated the number of non-motorized boat owning households, we

determined the number of boats, based on the average number of boats per boat-owning household (1.75 at the State level). To determine total non-motorized boats in California, Exhibit B.2 also includes estimates for commercial/institutional boats (based on the commercial survey summarized in Appendix D), and club-owned boats.

We also used the number of boat-owning households as the basis for calculating the number of participants in non-motorized boating (among boat owners). We calculated this estimate by multiplying the number of households owning non-motorized boats by the average number of participants per household (2.41 at the State level). We then determined the total number of current boat-owning participants, based on the percent of respondents that had participated in non-motorized boating in the last five years. This reduced participation from 2.3 million boat-owning Californians, in total, to 1.9 million current boat-owning Californian participants. To determine total participants, Exhibit B.2 also includes estimates for commercial/institutional participants, and club participants.

Estimating the number of participation days for non-motorized boating in California draws on one additional statistic from the statewide and regional random surveys, the average number of days per non-motorized boating participant. At the statewide level, the average (mean) number of participation days was 23.94. The average participation days at the regional level ranged from 9 to 29. What these average figures do not reflect is the wide range in participation days among respondents. At the statewide level, the number of participation days ranged from 1 to 250. The median participation days at the statewide level were 10, thus one-half of respondents boated 10 days or less, and one half boated 10 days or more. Using the median participation days in order to calculate total participation days would have resulted in a more conservative estimate of the number of days of non-motorized boating in California.

The final page of Exhibit B-2 provides calculations for estimating the number of non-motorized boats, by boat type. We provide estimates for the seven major categories of non-motorized boats, as well as a detailed breakdown for kayaks. It is important to note that when the number of boats, by type, is based on only a few survey respondents (particularly less than 25), we have less statistical confidence in extrapolating to the overall population. In addition, the estimate for small sailboats likely includes a significant number of sailboats that are larger than 8 feet in length, simply because respondents considered these to be “small” sailboats.

Page 5 of Exhibit B.2 provides a second set of calculations for estimating the number of non-motorized boats by boat type and utilization levels. In order to focus on non-motorized boats that Californian’s utilized most frequently on State waterways, page 5 of Exhibit B.2 provides estimates of non-motorized boats, by boat type, for only those boats that were regularly used by California boat owners, or were in commercial, institutional, or club fleets. Regular non-motorized boat use for boat owners was defined for this study purposes as boats owned by boat owners that utilized their non-motorized boat(s) five (5) or more days per year. The study defined two additional categories of non-motorized boat owners, “infrequent” boaters, defined as non-motorized boat owners that utilized their non-motorized boat(s) between one and four days per year, and “inactive” non-motorized boat owners, defined as non-motorized boat owners that did not utilize their boat(s) in the last five years. For the latter two boat use categories, page 5 of Exhibit B.2 provides only the total number of non-motorized boats.

The boat type estimates were based on the statewide survey responses and the total number of privately owned boats, statewide, of 1,696,987. However, one could achieve the same

results, within less than one percent, using household boat incidence rates and the average number of boats per household, by boat type. (Note, the boat type error rates in Table B.2 are based on the latter calculation approach, consistent with the regional error rates).

Because they are based on a smaller number of survey responses, the boat type estimates provided on page 5 of Exhibit B.2 are less statistically accurate than the overall boat type estimates provided on page 4 of Exhibit B.2. However, these estimates of regularly used boats provide reasonable estimates of the relative number of boats, by boat type, particularly for kayaks and inflatable boats.

The last two pages of Exhibit B.2 provides estimates for participants, and participation days, by boat types. These estimates were adjusted to match the more statistically accurate total number of non-motorized boat-owning participants (1,917,503) and participant days (45,905,022). The number of non-motorized boat owning participants were divided into two categories: (1) boat owners that utilized their boat(s) five or more days per year (regular boaters), and (2) boat owners that utilized their boat(s) only one to four days per year (infrequent boaters). We provide boat specific participants and participation day estimates only for regular boaters.

The participant estimates were conservative in that they do not take into account the fact that some non-motorized boaters may participate with more than one type of non-motorized boat. Because we used the total number of non-motorized boating participants as a starting point, and allocated these participants based on the number of boats, each individual boat owner participant was “assigned” to only one boat type. This approach was necessary because we did not have statewide survey data specific to boat type participation among all respondent household members.

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While the participant estimates provide minimum figures for boat type participants, these estimates involved making assumptions about boat use at a level of detail that we did not include in the survey. While we can generally assume that if 31.9 percent of utilized boats were kayaks, then 31.9 percent of participants used kayaks, we cannot determine how many of those 31.9 percent also used inflatable boats, canoes, and/or other types of non-motorized boats.

Non-motorized boating participation days estimates for regularly boating boat owners were based on: (1) the number of participants by boat type, multiplied by (2) the average number of participation days for regularly boating boat owners, by most-used boat. For example, for those regularly boating respondents that identified a

kayak as their most-used boat, the average number of participation days per year was 37.63. We multiplied 37.63 days by the estimated number of boat owning kayak participants (611,683), and then adjusted the result to match the more accurate overall estimate for total boat-owner participation days of 45,905,022.

Exhibit B.3 provides summary results for several of the questions asked of non-motorized boat-owning households, at the statewide level. The initial questions on boat ownership and final questions on participation trends and demographics were asked of all 351 respondents. Only the 288 respondents that had used their boats in the last five years were asked questions about where, and why, they participate in non-motorized boating.

**Non-Motorized Boating in California  
Statewide Random Survey**

**Telephone Questionnaire**

The California Department of Boating and Waterways is conducting its first ever study of non-motorized boating in California to understand how economically important boating is to California, and to plan future facilities to meet the needs of boaters. All your responses will be kept strictly confidential, and will only be presented in the aggregate form, together with other responses. The results of this study will be available late next year at the California Department of Boating and Waterways web page, [www.dbw.ca.gov](http://www.dbw.ca.gov).

Which of the following types of vehicles or vessels do you or someone in your household, currently own. [Initial screen question, interviewers continued the survey if the respondent had any of the non-motorized boat categories.]

- |               |   |   |
|---------------|---|---|
| 1. Motorcycle | 6. Motorboat                                  | 10. Rowing boat, including row boats, shells, sculls, dories, or driftboats |
| 2. Canoe      | 7. Inflatable boat or raft                    | 11. Sailboard or kiteboard  |
| 3. Kayak      | 8. Small sailboat 8 feet in length or shorter | 12. Other type of non-motorized boat.                                       |
| 4. SUV        | 9. Sailboat over 8 feet                       |   |
| 5. Bicycle    |   |   |

[If needed] For purposes of this study, "non-motorized boat" means any boat **not** currently registered with a vessel registration (CF) number from the California Department of Motor Vehicles. This non-motorized boat definition includes: (1) boats propelled by paddles or oars, and usually without a motor, such as canoes, kayaks, inflatable boats and rafts, rowing boats (including row boats, shells, sculls, dories, or driftboats), and other types of manually propelled boats; (2) sailboats 8 feet in length or shorter, and usually without a motor; and (3) sailboards or kiteboards. Non-motorized boats **do not** include "toy like" blow-up rafts and other non-durable water toys.

**Directions and clarifications are provided in bold type.**

\* \* \* \* \*

- There are many kinds of non-motorized boats, and we are interested in identifying specific types of boats you, or someone in your household, **currently owns**. Our definition of non-motorized boats means any boat **not** currently registered with a vessel registration (CF) number from the California Department of Motor Vehicles. This non-motorized boat definition includes: (1) boats propelled by paddles or oars, and usually without a motor, such as canoes, kayaks, inflatable boats and rafts, rowing boats (including row boats, shells, sculls, dories, or driftboats), and other types of manually propelled boats; (2) sailboats 8 feet in length or shorter, and usually without a motor; and (3) sailboards or kiteboards. Non-motorized boats **do not** include "toy like" blow-up rafts and other non-durable water toys. Do you or anyone in your household, own one or more of the following non-motorized boats, within this definition? (**Indicate all that apply**)

- 1 A. Canoe
- 2 B. Kayak
- 3 C. Inflatable Boat or Raft
- 4 D. Small Sailboat (8 feet in length or shorter)
- 5 E. Rowing Boat (including row boat, shell, scull, dory, or driftboat)
- 6 F. Sailboard or Kiteboard
- 7 G. Other type of non-motorized boat
- 8 I don't own a non-motorized boat. If you do not own a non-motorized boat, you do not need to complete the remainder of this survey.

Statewide Random Survey – Questionnaire (continued)

Complete question #2 for each category of non-motorized boat that you indicated above. If the specific type of non-motorized boat that you own is not identified, please fill in the appropriate “Other” entry.

2. Please identify the specific type of non-motorized boat, and how many of that type of boat that you, or someone in your household, owns. (Indicate all that apply)

**A. Canoes**

- 9 Hard-shell canoe – How many? \_\_\_\_ 10
- 11 Inflatable canoe – How many? \_\_\_\_ 12
- 13 Other specialty canoes:
  - 14 Hunting – How many? \_\_\_\_ 15
  - 16 Fishing – How many? \_\_\_\_ 17
  - 18 Outrigger – How many? \_\_\_\_ 19
  - 20 Whitewater – How many? \_\_\_\_ 21
  - 22 Other: \_\_\_\_\_ 23  
– How many? \_\_\_\_ 24

**B. Kayaks**

- 25 Recreational (flat-top plastic) kayak – How many? \_\_\_\_ 26
- 27 Inflatable kayak – How many? \_\_\_\_ 28
- 29 Whitewater kayak – How many? \_\_\_\_ 30
- 31 Sea or touring kayak – How many? \_\_\_\_ 32
- 33 Other specialty kayaks:
  - 34 Fishing kayak – How many? \_\_\_\_ 35
  - 36 Sailing kayak – How many? \_\_\_\_ 37
  - 38 Surfski – How many? \_\_\_\_ 39
  - 40 Surf kayak – How many? \_\_\_\_ 41
  - 42 Scuba kayak – How many? \_\_\_\_ 43
  - 44 Folding kayak – How many? \_\_\_\_ 45
  - 46 Other: \_\_\_\_\_ 47  
– How many? \_\_\_\_ 48

**C. Inflatable Boats and Rafts**

- 49 Inflatable raft – How many? \_\_\_\_ 50
- 51 Inflatable cataraft – How many? \_\_\_\_ 52
- 53 Inflatable transom boat or tender – How many? \_\_\_\_ 54
- 55 Other inflatable boat \_\_\_\_\_ – How many? \_\_\_\_ 56

**D. Sailboats**

- 57 Small sailboat (8 feet or shorter, such as an “El Toro”) – How many? \_\_\_\_ 58

**E. Rowing Boats**

- 59 Rowing shell or scull – How many? \_\_\_\_ 60
- 61 Row boat/dory/driftboat/tender – How many? \_\_\_\_ 62

**F. Sailboard/Kiteboard**

- 63 Sailboard – How many? \_\_\_\_ 64
- 65 Kiteboard – How many? \_\_\_\_ 66

**G. Other Non-Motorized Boats**

- 67 Dragon boat – How many? \_\_\_\_ 68
- 69 Paddle/peddle boat – How many? \_\_\_\_ 70
- 71 Other type of non-motorized boat: \_\_\_\_\_ 72 How many? \_\_\_\_ 73

Statewide Random Survey – Questionnaire (continued)

3. Did you use your non-motorized boat (or boats) in the last five years?

74 Yes 75 No (If “no”, please skip to question #39)

**Answer question #4 if, from question #2, you own more than one type of non-motorized boat. If you own only one type of non-motorized boat, skip to question #5.**

4. If you own more than one type of non-motorized boat, which boat type do you use most often?(for example, “whitewater kayak” or “rowboat”) \_\_\_\_\_76

**If you have multiple non-motorized boats, answer questions #5 to #15 for the one type of non-motorized boat that you use most often.**

\* \* \* \* \*

5. How many years have you owned this type of non-motorized boat? \_\_\_\_\_77

6. How many days a year do you typically use this type of non-motorized boat? \_\_\_\_\_78

7. On what waterway do you use your non-motorized boat most often? \_\_\_\_\_79

8. Please indicate any of the following that best describe why you used your non-motorized boat at this waterway: (Indicate all that apply)

- 80 Close to home, or convenient access
- 81 Facilities (parking, restrooms, day-use, camping)
- 82 Water and/or flow conditions (for example: rapids, wave conditions, wind conditions, reliable water flows, calm water, variety, clean water, etc.)
- 83 Not crowded
- 84 Visiting location for another reason (sightseeing, hiking, biking, camping, vacation, etc.)
- 85 Access to another activity (hunting, fishing, scuba/snorkeling, birdwatching, etc.)
- 86 Features or destinations (beach, shoreline, amenities, boating trails)
- 87 Other: \_\_\_\_\_88

9. Are there improvements or facility needs that would support non-motorized boating at this waterway? Examples of facility needs include restrooms, parking, signage, boating trails, storage, etc.

89 Yes 90 No (If “no”, skip to question #11)

10. If yes, what are they? (Indicate all that apply)

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> 91 Improved access to water            | <input type="checkbox"/> 98 Boating trails       | <input type="checkbox"/> 104 Improved water quality |
| <input type="checkbox"/> 92 Maintain water level/water releases | <input type="checkbox"/> 99 Docks                | <input type="checkbox"/> 105 Picnic areas           |
| <input type="checkbox"/> 93 Parking                             | <input type="checkbox"/> 100 Floats/launch ramps | <input type="checkbox"/> 106 Camping                |
| <input type="checkbox"/> 94 Restrooms                           | <input type="checkbox"/> 101 Beach area          | <input type="checkbox"/> 107 Motor-boat free zones  |
| <input type="checkbox"/> 95 Showers                             | <input type="checkbox"/> 102 Storage             | <input type="checkbox"/> 108 Whitewater park        |
| <input type="checkbox"/> 96 Freshwater boat wash                | <input type="checkbox"/> 103 Signage             | <input type="checkbox"/> 109 Other: _____110        |
| <input type="checkbox"/> 97 Low-impact facilities               |  |   |

11. Is there a second waterway where you use your non-motorized boat?

111 Yes 112 No (If “no”, skip to question #16)

12. If yes, what is the name of that waterway? \_\_\_\_\_113

Statewide Random Survey – Questionnaire (continued)

13. Why do you boat at this second waterway: (Identify up to three reasons)

- 1. \_\_\_\_\_114
- 2. \_\_\_\_\_115
- 3. \_\_\_\_\_116

14. Are there improvements or facility needs that would support non-motorized boating at this second waterway? 117 Yes 118 No (If “no”, skip to question #16)

15. If yes, what are they? (Identify up to three improvements or facility needs)

- 1. \_\_\_\_\_119
- 2. \_\_\_\_\_120
- 3. \_\_\_\_\_121

\* \* \* \* \*

16. Is there a California waterway that you avoid using, or would use more often, except that there are problems or facility needs at the waterway? 122 Yes 123 No (If “no”, skip to question #19)

17. If yes, what is the name of that waterway? \_\_\_\_\_124

18. If yes, please identify the problems or facility needs at that waterway: (Indicate all that apply)

- |   |  |
|---|--|
| <input type="checkbox"/> 125 Lack of access for non-motorized boats                           | <input type="checkbox"/> 130 Water conditions (water quality, obstructions, rapids, currents, low water levels, floating debris, etc.) |
| <input type="checkbox"/> 126 Overcrowding   | <input type="checkbox"/> 131 Reckless boaters  |
| <input type="checkbox"/> 127 Inconsistent water flows and/or problems related to dam releases | <input type="checkbox"/> 132 Other: _____  |
| <input type="checkbox"/> 128 Inadequate parking   | _____133   |
| <input type="checkbox"/> 129 Lack of or inadequate restrooms                                  |  |

\* \* \* \* \*

**Answer questions #19 to #24 only if you have more than one type of non-motorized boat, as identified in question #2. For example, if you have a sea kayak and a whitewater kayak, this would count as two types of boats. If you have six whitewater kayaks, this counts as only one type of boat. If you have only one type of boat, skip to question #25.**

19. What is the non-motorized boat type, from question #2, that you use the second most often?  
\_\_\_\_\_134

20. How many years have you owned this second type of non-motorized boat? \_\_\_\_\_135

21. How many days a year do you typically use this second type of non-motorized boat? \_\_\_\_\_136

**If you own a third type of non-motorized boat, answer questions #22 to #24, if not, skip to question #25.**

22. If you have more than two non-motorized boat types, from question #2, what is the non-motorized boat type that you use the third most often? \_\_\_\_\_137

23. How many years have you owned this third type of non-motorized boat? \_\_\_\_\_138

24. How many days per year do you typically use this third type of non-motorized boat? \_\_\_\_\_139

\* \* \* \* \*

Statewide Random Survey – Questionnaire (continued)

25. There are many reasons why people use non-motorized boats. Please indicate the reason (or multiple reasons) why you participate in non-motorized boating. **(Indicate all that apply)**

- |  |  |
|--|--|
| <input type="checkbox"/> <sub>140</sub> Recreation                               | <input type="checkbox"/> <sub>145</sub> For fitness  |
| <input type="checkbox"/> <sub>141</sub> Leisure and relaxation                   | <input type="checkbox"/> <sub>146</sub> For competition  |
| <input type="checkbox"/> <sub>142</sub> As a social activity                     | <input type="checkbox"/> <sub>147</sub> To enjoy nature  |
| <input type="checkbox"/> <sub>143</sub> As a family activity                     | <input type="checkbox"/> <sub>148</sub> To participate in another activity such as fishing, hunting, snorkeling, or scuba diving |
| <input type="checkbox"/> <sub>144</sub> For the physical and/or mental challenge | <input type="checkbox"/> <sub>149</sub> Other reason: _____  |
- \_\_\_\_\_150

26. Do you have safety concerns related to non-motorized boating? <sub>151</sub> Yes <sub>152</sub> No  
**(If “no”, skip to question #28)**

27. If yes, what are they? **(Indicate all that apply)**

- |   |  |
|---|--|
| <input type="checkbox"/> <sub>153</sub> Interactions with motorized vessels   | <input type="checkbox"/> <sub>158</sub> Boaters not using PFDs (personal floatation devices)                       |
| <input type="checkbox"/> <sub>154</sub> Inexperienced or unprepared boaters   | <input type="checkbox"/> <sub>159</sub> Using unsafe boats or equipment (ropes, paddles, improper boat, no helmet) |
| <input type="checkbox"/> <sub>155</sub> Problems related to overcrowding  | <input type="checkbox"/> <sub>160</sub> Waterborne illness/poor water quality                                      |
| <input type="checkbox"/> <sub>156</sub> Boating in unsafe water conditions (rapids, waves, rocks, debris, unpredictable flows, tides, currents, cold water, high water, cold water) | <input type="checkbox"/> <sub>161</sub> Other safety concerns: _____   |
| <input type="checkbox"/> <sub>157</sub> Boating in unsafe weather conditions (wind, cold, heat, lightening)   | _____162   |

28. This question relates to annual spending for durable goods and services related to non-motorized boating, not including boating trips. In the last 12 months, how much have you, and your household, spent on non-motorized boating equipment, supplies and services, for each of the following categories: **(Provide your best estimate)**

- \$ \_\_\_\_\_<sub>163</sub> New boats
- \$ \_\_\_\_\_<sub>164</sub> Used boats
- \$ \_\_\_\_\_<sub>165</sub> Repairs
- \$ \_\_\_\_\_<sub>166</sub> Boating supplies and equipment (racks, paddles, PFDs, ropes, parts, pumps, bags, sails, carts, helmets, etc.)
- \$ \_\_\_\_\_<sub>167</sub> Other gear (apparel, footwear, accessories)
- \$ \_\_\_\_\_<sub>168</sub> Memberships
- \$ \_\_\_\_\_<sub>169</sub> Classes, instruction, events
- \$ \_\_\_\_\_<sub>170</sub> Books, magazines, videos, DVDs
- \$ \_\_\_\_\_<sub>171</sub> Other annual expenses: \_\_\_\_\_172

\* \* \* \* \*

Statewide Random Survey – Questionnaire (continued)

The next several questions are about your most recent non-motorized boating trip in California, within the last five years. This could be a one-day outing, or a several-day trip.

29. First, what is the name of the waterway that you went to on your most recent trip?

\_\_\_\_\_173

30. If you have more than one type of non-motorized boat, from question #2, which boat type did you use on this trip?

\_\_\_\_\_174

31. Was non-motorized boating the primary purpose of this trip? 175 Yes 176 No

If “yes”, go to question #34, if “no”, answer questions #32 and #33, then go to question #34.

32. If no, what was the primary purpose of this trip? (Indicate one)

- 177 Camping
- 178 Motorized boating activity
- 179 Hiking or biking
- 180 Fishing or hunting
- 181 Sightseeing
- 182 Participating in another event (family gathering, vacation, business, sporting event)
- 183 Other : \_\_\_\_\_184

33. If no, what percent of your activity time (excluding travel) was spent on non-motorized boating?

\_\_\_\_\_185

\* \* \* \* \*

34. How many days was this trip? \_\_\_\_\_186

35. How many hours one-way did it take you to travel to your destination? \_\_\_\_\_187

36. How many miles one-way from your home is this destination? \_\_\_\_\_188

37. How many people traveled with you, in your immediate group, on this trip? \_\_\_\_\_189

38. For this most recent non-motorized boating trip, how much did you and your immediate traveling group spend for the following categories: (Provide your best estimate)

- \$ \_\_\_\_\_190 Fuel
- \$ \_\_\_\_\_191 Parking
- \$ \_\_\_\_\_192 Entrance and/or launch fees
- \$ \_\_\_\_\_193 Shuttle services
- \$ \_\_\_\_\_194 Grocery and convenience stores
- \$ \_\_\_\_\_195 Retail, gift, specialty, or other stores
- \$ \_\_\_\_\_196 Restaurants
- \$ \_\_\_\_\_197 Motels/hotels
- \$ \_\_\_\_\_198 Campgrounds
- \$ \_\_\_\_\_199 Other: \_\_\_\_\_200

Statewide Random Survey – Questionnaire (continued)

\* \* \* \* \*

39. How many years have you been involved in some form of non-motorized boating?

- <sub>201</sub> Less than 5 years
- <sub>202</sub> 5 to 9 years
- <sub>203</sub> 10 to 14 years
- <sub>204</sub> 15 to 20 years
- <sub>205</sub> More than 20 years

40. In the next five years, how many days per year do you think you will participate in non-motorized boating, as compared to the last five years? **(Indicate one)** (If “a lot more” or “a little more”, answer question #41, then go to question #43; if “a lot less” or “a little less”, skip to question #42; if “about the same”, skip to question #43)

- <sub>206</sub> A lot more
- <sub>207</sub> A little more
- <sub>208</sub> About the same
- <sub>209</sub> A little less
- <sub>210</sub> A lot less

41. If you answered a lot more, or a little more, why will you be increasing your participation? **(Indicate all that apply)**

- <sub>211</sub> More free time
- <sub>212</sub> Enjoy the activity
- <sub>213</sub> Non-motorized boating is replacing another hobby/activity
- <sub>214</sub> As a social activity/my friends are doing it
- <sub>215</sub> As a family activity/my family is doing it
- <sub>216</sub> My skill level has improved
- <sub>217</sub> To try new types of non-motorized boating
- <sub>218</sub> Other: \_\_\_\_\_<sub>219</sub>

42. If you answered a lot less, or a little less, why will you decrease participation? **(Indicate all that apply)**

- <sub>220</sub> Not enough time
- <sub>221</sub> No longer interested
- <sub>222</sub> Lack of access to an appropriate waterway
- <sub>223</sub> Lack of facilities or inadequate facilities
- <sub>224</sub> Logistics make it too difficult
- <sub>225</sub> Expense
- <sub>226</sub> Health/illness/injury
- <sub>227</sub> Too crowded
- <sub>228</sub> Other: \_\_\_\_\_<sub>229</sub>

Statewide Random Survey – Questionnaire (continued)

43. Are you a member of any non-motorized boating clubs or organizations?  
<sup>230</sup> Yes <sup>231</sup> No (If “no”, skip to question #45)

44. If yes, please list all the non-motorized boating organizations or clubs that you belong to:  
(Identify up to five organizations or clubs)

1. \_\_\_\_\_<sup>232</sup>
2. \_\_\_\_\_<sup>233</sup>
3. \_\_\_\_\_<sup>234</sup>
4. \_\_\_\_\_<sup>235</sup>
5. \_\_\_\_\_<sup>236</sup>

**The last several questions will help us understand who participates in non-motorized boating activities. Remember, your answers are confidential, and will only be presented in aggregate form.**

45. What is your age?

- <sup>237</sup> Under 18
- <sup>238</sup> 18-25
- <sup>239</sup> 25-34
- <sup>240</sup> 35-44
- <sup>241</sup> 45-55
- <sup>242</sup> 56-65
- <sup>243</sup> Over 65

46. What is your zip code? \_\_\_\_\_<sup>244</sup>

47. What is your gender? <sup>245</sup> Male <sup>246</sup> Female

48. What is your marital status? <sup>247</sup> Single <sup>248</sup> Married

49. How many people are in your household? \_\_\_\_\_<sup>249</sup>

50. How many people in your household participate in non-motorized boating? \_\_\_\_\_<sup>250</sup>

51. What is your ethnicity?

- <sup>251</sup> Caucasian
- <sup>252</sup> Black
- <sup>253</sup> Latin
- <sup>254</sup> Native American
- <sup>255</sup> Asian
- <sup>256</sup> Other

Statewide Random Survey – Questionnaire (continued)

52. What level of education have you completed?

- <sub>257</sub> High school
- <sub>258</sub> Some college
- <sub>259</sub> B.A. or equivalent
- <sub>260</sub> Advanced degree (MS, MA, PhD, MD, JD, etc.)

53. What was your household's combined income for 2005?

- <sub>261</sub> Under \$25,000
- <sub>262</sub> \$25,000 up to \$50,000
- <sub>263</sub> Over \$50,000 up to \$100,000
- <sub>264</sub> Over \$100,000 up to \$200,000
- <sub>265</sub> Over \$200,000

54. Please provide any additional comments or suggestions related to non-motorized boating or non-motorized boating facilities in California:

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Thank you for your time. Do you have any questions?

**Exhibit B.2**

**Number of Boats, Households, and Participants Based on Statewide and Regional Random Telephone Survey of California Households (2006)**

**Incidence Rate - Percent of Households Owning One or More Non-Motorized Boats, Statewide and By Region in California (2006)**

	A. Completed State Surveys	B. Completed Region Surveys	C. Total Completed Surveys (A+B)	D. State Did Not Qualify	E. Region Did Not Qualify	F. Total Did Not Qualify (D+E)	G. Total Contacts (C+F)	H. Incidence Rate C/G
Statewide Total	351	–	351	4,124	–	4,124	4,475	7.84%
1. North Coast (NC)	34	12	46	116	77	193	239	19.25%
2. San Francisco Bay Area (SF)	62	5	67	882	72	954	1,021	6.56%
3. Central Coast (CC)	21	12	33	130	75	205	238	13.87%
4. South Coast (SC)	67	–	67	1,308	–	1,308	1,375	4.87%
5. San Diego (SD)	26	–	26	319	–	319	345	7.54%
6. Northern Interior (NI)	3	46	49	10	147	157	206	23.79%
7. Sacramento Basin (SB)	87	–	87	459	5	464	551	15.79%
8. Central Valley (CV)	39	–	39	469	–	469	508	7.68%
9. Eastern Sierra (ES)	–	35	35	6	133	139	174	20.11%
10. Southern Interior (SI)	12	13	25	425	344	769	794	3.15%
<b>Total</b>	<b>351</b>	<b>123</b>	<b>474</b>	<b>4,124</b>	<b>853</b>	<b>4,977</b>	<b>5,451</b>	

**Number of Households Owning One or More Non-Motorized Boats, Statewide and By Region in California (2006)**

	I. California Households (2006)	J. NMB Owning Households (unadjusted) (H x I)	K. Percent NMB Owning HH by Region	L. Regional HH Adjustment (K x N)	M. Adjusted NMB Owning Households (J + L)
Statewide Total	12,368,706	969,707			969,707
1. North Coast (NC)	281,433	54,176	6.12%	5,215	59,391
2. San Francisco Bay Area (SF)	2,416,004	158,490	17.92%	15,270	173,760
3. Central Coast (CC)	325,073	45,088	5.10%	4,346	49,434
4. South Coast (SC)	4,613,738	224,689	25.40%	21,643	246,332
5. San Diego (SD)	1,069,740	80,658	9.12%	7,771	88,429
6. Northern Interior (NI)	34,082	8,108	0.92%	784	8,892
7. Sacramento Basin (SB)	1,107,034	174,801	19.76%	16,838	191,639
8. Central Valley (CV)	1,249,799	95,985	10.85%	9,245	105,230
9. Eastern Sierra (ES)	14,386	2,893	0.33%	281	3,174
10. Southern Interior (SI)	1,257,417	39,609	4.48%	3,817	43,426
<b>Total</b>	<b>12,368,706</b>	<b>884,497</b>	<b>100.00%</b>	<b>85,210</b>	<b>969,707</b>
<b>N. Difference, State – Region Sum</b>		85,210			

**Number of Non-Motorized Boats Owned by Households, Statewide and By Region in California (2006)**

	C. Total Completed Surveys	O. Total Boats Owned by Respondents	P. Average Number of Boats per Household (O/C)	Q. NMBs Owned by HH (unadjusted) (M x P)	R. Percent NMBs by Region	S. Regional NMB Adjustment (R x U)	T. Adjusted NMBs Owned by HH (Q + S)
Statewide Total	351	616	1.75	1,696,987			1,696,987
1. North Coast (NC)	46	79	1.72	102,153	6.21%	3,196	105,349
2. San Francisco Bay Area (SF)	67	111	1.66	288,442	17.53%	9,023	297,465
3. Central Coast (CC)	33	64	1.94	95,902	5.83%	3,001	98,903
4. South Coast (SC)	67	105	1.57	386,741	23.50%	12,096	398,837
5. San Diego (SD)	26	44	1.69	149,445	9.08%	4,674	154,119
6. Northern Interior (NI)	49	94	1.92	17,073	1.04%	535	17,608
7. Sacramento Basin (SB)	87	161	1.85	354,532	21.54%	11,087	365,619
8. Central Valley (CV)	39	63	1.62	170,473	10.36%	5,332	175,805
9. Eastern Sierra (ES)	35	67	1.91	6,062	0.37%	190	6,252
10. Southern Interior (SI)	25	43	1.72	74,693	4.54%	2,337	77,030
<b>Total</b>				<b>1,645,516</b>	<b>100.00%</b>	<b>51,471</b>	<b>1,696,987</b>
<b>U. Difference, State – Region Sum</b>				51,471			

We normalized regional results to reflect more statistically accurate statewide total boat-owning households and boats, using an adjustment factor equal to the relative percent of households (or boats) in each region, based on the regional survey results. We then applied this percent to allocate the difference between the statewide estimate and the sum of regional estimates proportionally to each region.

## B. Statewide and Regional Random Surveys

### Exhibit B.2

#### Number of Boats, Households, and Participants Based on Statewide and Regional Random Telephone Survey of California Households (2006) (continued)

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##### Individuals from Non-Motorized Boat-Owning Households Participating in Non-Motorized Boating, Statewide and By Region in California (2006)

	M. Adjusted NMB Owning Households	C. Total Completed Surveys	V. Respondent's Total HH Participants	W. Average Participants per HH (V/C)	X. Total NMB Owning HH Participants (unadjusted) (M x W)	Y. Percent Participants by Region	Z. Regional Participant Adjustment (AB x Y)	AA. Adjusted Total NMB Owning HH Participants (X+Z)
Statewide Total	969,707	351	845	2.41	2,336,994			2,336,994
1. North Coast (NC)	59,391	46	104	2.26	134,224	5.71%	(847)	133,377
2. San Francisco Bay Area (SF)	173,760	67	155	2.31	401,386	17.07%	(2,532)	398,854
3. Central Coast (CC)	49,434	33	88	2.67	131,989	5.61%	(832)	131,157
4. South Coast (SC)	246,332	67	171	2.55	628,147	26.71%	(3,962)	624,185
5. San Diego (SD)	88,429	26	55	2.12	187,469	7.97%	(1,182)	186,287
6. Northern Interior (NI)	8,892	49	115	2.35	20,896	0.89%	(132)	20,764
7. Sacramento Basin (SB)	191,639	87	191	2.20	421,606	17.92%	(2,658)	418,948
8. Central Valley (CV)	105,230	39	111	2.85	299,906	12.75%	(1,891)	298,015
9. Eastern Sierra (ES)	3,174	35	70	2.00	6,348	0.27%	(40)	6,308
10. Southern Interior (SI)	43,426	25	69	2.76	119,856	5.10%	(757)	119,099
<b>Total</b>	<b>969,707</b>				<b>2,351,827</b>	<b>100.00%</b>	<b>(14,833)</b>	<b>2,336,994</b>
<b>AB. Difference, State - Region Sum</b>					(14,833)			

##### Currently Participating Individuals from Non-Motorized Boat-Owning Households Participating in Non-Motorized Boating, Statewide and By Region (used their boat in the last five years) in California (2006)

	M. Adjusted NMB Owning Households	W. Average Participants per HH (V/C)	AC. Number of Respondents Boating in Last 5 Years	C. Total Completed Surveys	AD. Percent of Respondents Boating in Last Five Years (AC/C)	AE. Number of Current Participants from NMB HH (unadjusted) (M x W x AD)	AF. Percent Participants by Region	AG. Regional Participant Adjustment (AF x AI)	AH. Adjusted Current NMB Participants (AE + AG)
Statewide Total	969,707	2.41	288	351	82.05%	1,917,503			1,917,503
1. North Coast (NC)	59,391	2.26	40	46	86.96%	116,721	6.10%	226	116,947
2. San Francisco Bay Area (SF)	173,760	2.31	53	67	79.10%	317,496	16.59%	615	318,111
3. Central Coast (CC)	49,434	2.67	30	33	90.91%	119,991	6.27%	232	120,223
4. South Coast (SC)	246,332	2.55	55	67	82.09%	515,646	26.94%	998	516,644
5. San Diego (SD)	88,429	2.12	23	26	88.46%	165,836	8.67%	321	166,157
6. Northern Interior (NI)	8,892	2.35	43	49	87.76%	18,339	0.96%	36	18,375
7. Sacramento Basin (SB)	191,639	2.20	70	87	80.46%	339,224	17.72%	657	339,881
8. Central Valley (CV)	105,230	2.85	31	39	79.49%	238,395	12.46%	462	238,857
9. Eastern Sierra (ES)	3,174	2.00	30	35	85.71%	5,441	0.28%	10	5,451
10. Southern Interior (SI)	43,426	2.76	16	25	64.00%	76,708	4.01%	149	76,857
<b>Total</b>	<b>969,707</b>					<b>1,913,797</b>	<b>100.00%</b>	<b>3,706</b>	<b>1,917,503</b>
<b>AI. Difference, State - Region Sum</b>						3,706			

**Exhibit B.2**

**Number of Boats, Households, and Participants Based on Statewide and Regional Random Telephone Survey of California Households (2006) (continued)**

**Total Current California Non-Motorized Boating Participants – NMB Owners, Commercial and Institutional Participants, Club Participants, Statewide and by Region (2006)**

	AH. Adjusted Current NMB Participants (AE + AG)	AJ. Commercial/Institutional Participants	AK. Club Participants	AL. Total Participants (AH+AJ+AK)	AM. California Population (2006)	AN. Participants as Percent of CA Population (AL/AM)	AO. CA Population Age 12 and Over (81.2%)	AP. Participants as Percent Population 12 and Over (AL/AO)
Statewide Total	1,917,503	539,822	33,000	<b>2,490,325</b>	37,195,240	6.70%	30,202,535	8.25%
1. North Coast (NC)	116,947	70,523		187,470				
2. San Francisco Bay Area (SF)	318,111	45,122	9,000	372,233				
3. Central Coast (CC)	120,223	26,404	1,400	148,027				
4. South Coast (SC)	516,644	108,317	12,800	637,761				
5. San Diego (SD)	166,157	52,979	9,600	228,736				
6. Northern Interior (NI)	18,375	13,953		32,328				
7. Sacramento Basin (SB)	339,881	122,627	200	462,708				
8. Central Valley (CV)	238,857	96,622		335,479				
9. Eastern Sierra (ES)	5,451	725		6,176				
10. Southern Interior (SI)	76,857	2,550		79,407				
<b>Total</b>	<b>1,917,503</b>	<b>539,822</b>	<b>33,000</b>	<b>2,490,325</b>				

Note: Regional participation rates were not calculated because many commercial/institutional participants do not live in the region that they participated in.

**Total Current California Non-Motorized Boating Participation Days – NMB Owners, Commercial and Institutional Participants, Club Participants, Statewide and By Region (2006)**

	AQ. Average Currently Participating Boat Owner Annual Days	AR. Total Currently Participating Boat Owner Annual Days (unadjusted) (AH x AQ)	AS. Percent Days by Region	AT. Regional Participation Days Adjustment (AS x AZ)	AU. Total Adjusted Currently Participating Boat Owner Annual Days (AR+AT)	AV. Commercial/Institutional Participation Days	AW. Club Participation Days	AX. Total Participation Days (AU+AV+AW)	AY. Percent Total Participation Days by Region
Statewide Total	23.94	45,905,022			<b>45,905,022</b>	726,472	1,870,000	<b>48,501,494</b>	
1. North Coast (NC)	22.98	2,687,442	6.03%	79,598	2,767,040	86,377		2,853,417	5.88%
2. San Francisco Bay Area (SF)	20.74	6,597,622	14.80%	195,364	6,792,986	54,838	542,500	7,390,324	15.24%
3. Central Coast (CC)	19.87	2,388,831	5.36%	70,754	2,459,585	33,485	68,500	2,561,570	5.28%
4. South Coast (SC)	22.87	11,815,648	26.50%	349,808	12,165,456	126,817	708,000	13,000,273	26.80%
5. San Diego (SD)	26.61	4,421,438	9.92%	130,947	4,552,385	57,476	531,000	5,140,861	10.60%
6. Northern Interior (NI)	21.05	386,794	0.87%	11,484	398,278	23,415		421,693	0.87%
7. Sacramento Basin (SB)	24.53	8,337,281	18.70%	246,845	8,584,126	193,312	20,000	8,797,438	18.14%
8. Central Valley (CV)	29.74	7,103,607	15.93%	210,281	7,313,888	147,324		7,461,212	15.39%
9. Eastern Sierra (ES)	23.43	127,717	0.28%	3,696	131,413	878		132,291	0.27%
10. Southern Interior (SI)	9.35	718,613	1.61%	21,252	739,865	2,550		742,415	1.53%
<b>Total</b>		<b>44,584,993</b>	<b>100.00%</b>	<b>1,320,029</b>	<b>45,905,022</b>	<b>726,472</b>	<b>1,870,000</b>	<b>48,501,494</b>	<b>100.00%</b>
<b>AZ. Difference, State - Region Sum</b>		1,320,029							

We normalized regional results to reflect more statistically accurate statewide total participation, using an adjustment factor equal to the relative percent of participants in each region, based on the regional survey results. We then applied this percent to allocate the difference between the statewide estimate and the sum of regional estimates proportionally to each region.

Commercial and institutional participants from the survey of 112 commercial entities, extrapolated to additional commercial entities that did not respond to the survey using information on each business from web pages, and extrapolating by activity (rental, instruction, guided trips) and region. (See Appendix D).

**Club Participation Calculations (2006)**

Club Type	Participants	Average Days	Total Days
Rowing	5,000	100	500,000
Dragon Boat	3,000	100	300,000
Outrigger Canoe	3,000	100	300,000
Yacht/Sailing	22,000	35	770,000
<b>Totals</b>	<b>33,000</b>		<b>1,870,000</b>

Club participants of 33,000 and regional allocations based on results of interviews with boating organizations, and club member participation in the active-user Internet survey. Club participation estimates are for rowing (5,000), outrigger canoe (3,000), dragon boat (3,000), and yacht club learn-to-sail and race programs (22,000). Club participation days of 1,870,000 are based on average of 100 days for rowing, outrigger, and dragon boat club participants, and 35 days per year for sailing participants (based on sail boat owners in statewide survey).

## B. Statewide and Regional Random Surveys

### Exhibit B.2

#### Number of Boats, Households, and Participants Based on Statewide and Regional Random Telephone Survey of California Households (2006) (continued)

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#### Number of Total Boats by Boat Type and Kayak Subtype Calculated Based on Distribution of 616 Boats Owned by 351 Completed Statewide Surveys in California (2006)

Boat Type	A. Number of Boats by Boat Type	B. Percent of Boats by Boat Type	C. Boats by Boat Type (B x D)
Canoe	69	11.20%	190,063
Kayak	194	31.49%	534,381
Inflatable*	257	41.72%	707,983
Small Sailboat**	15	2.43%	41,237
Rowing Boat	58	9.42%	159,856
Sailboard/Kiteboard	20	3.25%	55,152
Other	3	0.49%	8,315
<b>Total</b>	<b>616</b>	<b>100.00%</b>	<b>1,696,987</b>
<b>D. CA Total Owned NMBs</b>	<b>1,696,987</b>		

\* For purposes of this study, the "inflatable" category includes inflatable rafts, catarafts, and transoms. Inflatable kayaks are included in the "kayak" category.

\*\* Many boaters consider any sailboat that they store at home, and load on their car, a "small sailboat", even if the sailboat is longer than 8 feet in length. This estimate of small sailboats includes a significant number of these larger small sailboats.

Kayak Subtypes	E. Number of Boats by Kayak Type	F. Percent of Kayaks by Kayak Type	G. Kayaks by Kayak Type (F x H)
Recreational Kayak	86	44.33%	236,891
Inflatable Kayak*	27	13.92%	74,386
Whitewater Kayak	20	10.31%	55,095
Sea/Touring Kayak	48	24.74%	132,206
Other Kayaks	13	6.70%	35,803
<b>Total</b>	<b>194</b>	<b>100.00%</b>	<b>534,381</b>
<b>H. Total Kayaks (from above)</b>		534,381	

\* There is some ambiguity within kayak definitions, as inflatable kayaks may be used for recreational paddling, touring, and whitewater paddling.

#### Total Number of Non-Motorized Boats by Boat Type – Households, Commercial and Institutional, and Clubs in California (2006)

Boat Type	C. Total Boats by Boat Type	I. Commercial/ Institutional Boats	J. Club Boats	K. Total Boats by Boat Type (C+I+J)	Percent of Boats
Canoe	190,063	942	500	191,505	11.17%
Kayak	534,381	8,870		543,251	31.68%
Inflatable	707,983	3,526		711,509	41.49%
Small Sailboat	41,237	433	1,100	42,770	2.49%
Rowing Boat	159,856	279	600	160,735	9.38%
Sailboard/Kiteboard	55,152	817		55,969	3.26%
Other	8,315	195	500	9,010	0.53%
<b>Total</b>	<b>1,696,987</b>	<b>15,062</b>	<b>2,700</b>	<b>1,714,749</b>	<b>100.00%</b>

Kayak Subtypes	G. Total Kayaks by Kayak Type	L. Commercial/ Institutional Kayaks	M. Total Kayaks by Kayak Type (G+L)	Percent of Kayaks
Recreational Kayak	236,891	5,102	241,993	44.55%
Inflatable Kayak	74,386	1,175	75,561	13.91%
Whitewater Kayak	55,095	450	55,545	10.22%
Sea/Touring Kayak	132,206	1,864	134,070	24.68%
Other Kayaks	35,803	279	36,082	6.64%
<b>Total</b>	<b>534,381</b>	<b>8,870</b>	<b>543,251</b>	<b>100.00%</b>

Commercial and institutional boats based on results of survey of 112 commercial entities, extrapolated based on boat type to additional entities that did not respond to the survey. Club boats based on interviews with club organizers and organization web pages.

**Exhibit B.2**

**Number of Boats, Households, and Participants Based on Statewide and Regional Random Telephone Survey of California Households (2006) (continued)**

**Number of Boats by Utilization Level, Boat Type and Kayak Subtype Calculated Based on Distribution of 616 Boats Owned by 351 Completed Statewide Surveys in California (2006)**

Boat Type	A. Number of Boats by Boat Type	B. Percent of Boats by Boat Type	C. Boats by Boat Type (B x D)
a. Boats Utilized 5 Days or More per Year			
1. Canoe	45	7.30%	123,880
2. Kayak	171	27.76%	471,084
3. Inflatable*	151	24.51%	415,931
4. Small Sailboat**	7	1.14%	19,345
5. Rowing Boat	34	5.52%	93,674
6. Sailboard/Kiteboard	16	2.60%	44,122
7. Other	3	0.49%	8,315
b. Boats Utilized 1 to 4 Days per Year	109	17.69%	300,197
c. Boats Not Utilized Within Last 5 Years	80	12.99%	220,439
<b>Total</b>	<b>616</b>	<b>100.00%</b>	<b>1,696,987</b>
<b>D. CA Total Owned NMBs</b>	1,696,987		

\* For purposes of this study, the "inflatable" category includes inflatable rafts, catarafts, and transoms. Inflatable kayaks are included in the "kayak" category.  
 \*\* Many boaters consider any sailboat that they store at home, and load on their car, as a "small sailboat", even if the sailboat is longer than 8 feet in length. This estimate of small sailboats includes a significant number of these longer small sailboats.

**Estimated Number of Kayaks Utilized Five Days or More per Year, by Kayak Type in California (2006)**

Kayak Subtypes	E. Number of Boats by Kayak Type	F. Percent of Kayaks by Kayak Type	G. Kayaks by Kayak Type (F x H)
1. Recreational Kayak	74	43.27%	203,838
2. Sea/Touring Kayak	44	25.73%	121,210
3. Inflatable Kayak*	25	14.62%	68,872
4. Whitewater Kayak	18	10.53%	49,605
5. Other Kayaks	10	5.85%	27,559
<b>Total</b>	<b>171</b>	<b>100.00%</b>	<b>471,084</b>
<b>H. Total Kayaks (from above)</b>	471,084		

\* There is some ambiguity within kayak definitions, as inflatable kayaks may be used for recreational paddling, touring, and whitewater paddling.

**Total Number of Non-Motorized Boats by Utilization Level and Boat Type - Households, Commercial and Institutional, and Clubs in California (2006)**

Boat Type	C. Total Boats by Boat Type	I. Commercial/ Institutional Boats	J. Club Boats	K. Total Boats by Boat Type (C + I + J)	Percent of Boats
a. Boats Utilized 5 Days or More per Year					
1. Canoe	123,880	942	500	125,322	7.3%
2. Kayak	471,084	8,870		479,954	28.0%
3. Inflatable*	415,931	3,526		419,457	24.5%
4. Small Sailboat**	19,345	433	1,100	20,878	1.2%
5. Rowing Boat	93,674	279	600	94,553	5.5%
6. Sailboard/Kiteboard	44,122	817		44,939	2.6%
7. Other	8,315	195	500	9,010	0.5%
b. Boats Utilized 1 to 4 Days per Year	300,197			300,197	17.5%
c. Boats Not Utilized Within Last 5 Years	220,439			220,439	12.9%
<b>Total</b>	<b>1,696,987</b>	<b>15,062</b>	<b>2,700</b>	<b>1,714,749</b>	<b>100.0%</b>

\* For purposes of this study, the "inflatable" category includes inflatable rafts, catarafts, and transoms. Inflatable kayaks are included in the "kayak" category.  
 \*\* Many boaters consider any sailboat that they store at home, and load on their car, as a "small sailboat", even if the sailboat is longer than 8 feet in length. This estimate of small sailboats includes a significant number of these longer small sailboats.

**Estimated Number of Kayaks Utilized Five Days or More per Year, by Kayak Type in California (2006)**

Kayak Subtypes	G. Total Kayaks by Kayak Type	L. Commercial/ Institutional Kayaks	M. Total Kayaks by Kayak Type (G + L)	Percent of Kayaks
1. Recreational Kayak	203,838	5,102	208,940	43.53%
2. Sea/Touring Kayak	121,210	1,864	123,074	25.65%
3. Inflatable Kayak*	68,872	1,175	70,047	14.59%
4. Whitewater Kayak	49,605	450	50,055	10.43%
5. Other Kayaks	27,559	279	27,838	5.80%
<b>Total</b>	<b>471,084</b>	<b>8,870</b>	<b>479,954</b>	<b>100.00%</b>

\* There is some ambiguity within kayak definitions, as inflatable kayaks may be used for recreational paddling, touring, and whitewater paddling.  
 Commercial and institutional boats based on survey of 112 commercial entities, extrapolated based on boat type to additional entities that did not respond to the survey. Club boats based on interviews with club organizers and organization web pages.

## B. Statewide and Regional Random Surveys

### Exhibit B.2

#### Number of Boats, Households, and Participants Based on Statewide and Regional Random Telephone Survey of California Households (2006) (continued)

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#### Total Current California Non-Motorized Boating Participants, by Utilization Level and Boat Type – NMB Owners, Commercial and Institutional Participants, and Club Participants (2006)

Boat Type	C. Boats by Boat Type (Utilized Boats Only)	N. Percent of Utilized Boats	O. Total Owning Participants* (N x S)	P. Commercial/ Institutional Participants	Q. Club Participants	R. Total Participants (O + P + Q)	Percent of Total Participants	Percent of Population 12 and Over Participating (R/T)
a. Boats Utilized 5 Days or More per Year								
1. Canoe	123,880	8.4%	161,070	60,085	3,000	224,155	9.0%	0.7%
2. Kayak	471,084	31.9%	611,683	164,525		776,208	31.2%	2.6%
3. Inflatable	415,931	28.2%	540,736	272,765		813,501	32.7%	2.7%
4. Small Sailboat	19,345	1.3%	24,928	8,209	22,000	55,137	2.2%	0.2%
5. Rowing Boat	93,674	6.3%	120,803	6,164	5,000	131,967	5.3%	0.4%
6. Sailboard/ Kiteboard	44,122	3.0%	57,525	14,356		71,881	2.9%	0.2%
7. Other	8,315	0.6%	11,505	13,718	3,000	28,223	1.1%	0.1%
8. Total Boats Utilized 5 Days or More per Year	1,176,351	79.7%	1,528,250			2,101,072	84.4%	6.9%
b. Boats Utilized 1 to 4 Days per Year	300,197	20.3%	389,253			389,253	15.6%	1.3%
Total	1,476,548	100.0%	1,917,503	539,822	33,000	2,490,325	100.0%	8.2%
<b>S. California Total Owning Participants</b>	<b>1,917,503</b>							
<b>T. California 2006 Population 12 and Over</b>	<b>30,202,535</b>							

\* Total participants by boat type were adjusted to match the total number of participants overall. As a result, these estimates assume that each participant utilized only one boat type. Because some participants used multiple boat types, these are conservative estimates of boat type participation.

**Exhibit B.2**

**Number of Boats, Households, and Participants Based on Statewide and Regional Random Telephone Survey of California Households (2006) (continued)**

**Total Current California Non-Motorized Participation Days, by Utilization Level and Boat Type - NMB Owners, Commercial and Institutional Participants, and Club Participants (2006)**

Boat Type	U. Participation Days per Participant	V. Unadjusted Participation Days (O x U)	W. Percent of Participation Days	X. Boat Type Participant Days Adjustment (W x AD)	Y. Adjusted Utilizing Owner Participation Days (V + X)	Z. Club Participation Days	AA. Commercial/ Institutional Participation Days	AB. Total Participation Days (Y + Z + AA)	Percent of Total
a. Boats Utilized 5 Days or More per Year									
1. Canoe	31.50	5,073,705	10.22%	(381,960)	4,691,745	300,000	101,706	5,093,451	10.5%
2. Kayak	37.63	23,017,631	46.37%	(1,733,021)	21,284,610		231,745	21,516,355	44.4%
3. Inflatable	26.84	14,513,354	29.24%	(1,092,809)	13,420,545		337,083	13,757,628	28.3%
4. Small Sailboat	51.83	1,292,018	2.60%	(97,172)	1,194,846	770,000	10,171	1,975,017	4.1%
5. Rowing Boat	30.13	3,639,794	7.33%	(273,950)	3,365,844	500,000	7,265	3,873,109	8.0%
6. Sailboard/ Kiteboard	10.67	613,792	1.24%	(46,342)	567,450		18,888	586,338	1.2%
7. Other	46.80	538,434	1.08%	(40,364)	498,070	300,000	19,614	817,684	1.7%
8. Total Boats Utilized 5 Days or More per Year		48,688,728	98.08%	(3,665,618)	45,023,110	1,870,000	726,472	47,619,582	98.2%
b. Boats Utilized 1 to 4 Days per Year	2.45	953,670	1.92%	(71,758)	881,912			881,912	1.8%
Total		49,642,398	100.00%	(3,737,376)	45,905,022	1,870,000	726,472	48,501,494	100.0%
<b>AC. California Total Owning Participant Days</b>		<b>45,905,022</b>							
<b>AD. Difference, Total - Boat Type Sum</b>		<b>(3,737,376)</b>							

**Exhibit B.3**  
**Summary of Statewide Random Survey Respondents (2006) (n=351)**

Boater Gender	
Males	58%
Females	42%
<b>100%</b>	

Boater Marital Status	
Married	69%
Single	29%
NA	2%
<b>100%</b>	

Used a Boat in Last 5 Years?	
Yes	82%
No	18%

Education	Percent
High School	16%
Some College	28%
BA or Equivalent	30%
Advanced Degree	24%
NA	2%
<b>100%</b>	

Number of Boats Owned	
1	61%
2	22%
3	10%
4	3%
5	2%
6	1%
7 to 11	1%
<b>100%</b>	
<b>Average</b>	<b>1.75 boats</b>
<b>Median</b>	<b>1 boat</b>

Years Owned Most-Used Non-Motorized Boat	
1 to 2	21%
3 to 4	22%
5 to 6	17%
7 to 8	11%
9 to 10	13%
11 to 14	4%
15 to 20	7%
Over 20 years	5%
<b>(n=288)</b>	<b>100%</b>

Number of Boaters in Household
<b>2.4</b>

Age	Percent
Under 18	1%
18 to 24	5%
25 to 34	8%
35 to 44	18%
45 to 55	29%
56 to 65	23%
Over 65	15%
NA	1%
<b>100%</b>	

Ethnicity	Percent
Caucasian	84%
Asian	1%
Black	1%
Latin	6%
Native American	1%
Other	3%
NA	4%
<b>100%</b>	

Years Involved in Non-Motorized Boating	
Less than 5 years	14%
5 to 9 years	13%
10 to 14 years	11%
15 to 20 years	15%
Over 20 years	46%
NA	1%
<b>100%</b>	

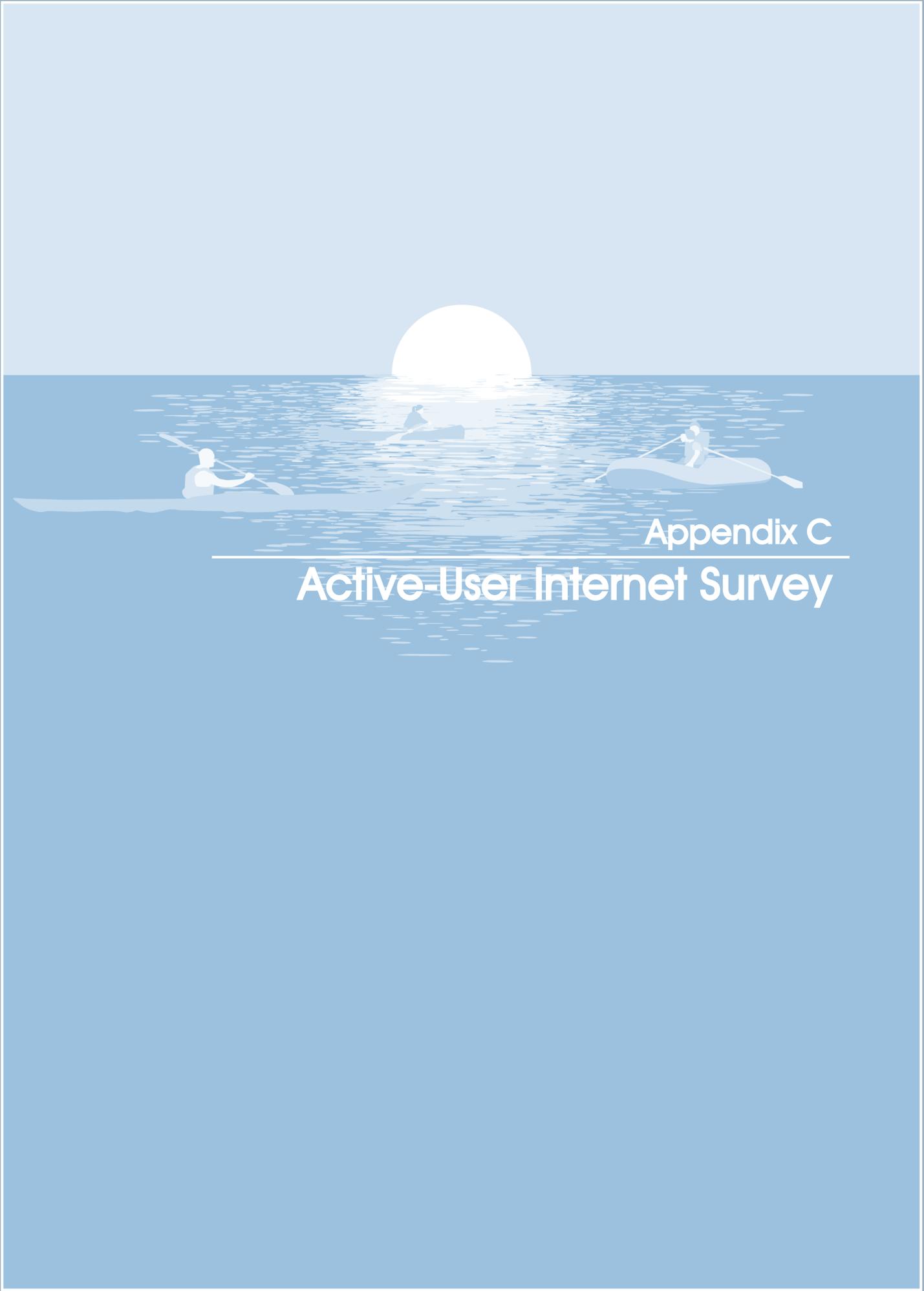
Days per Year of Non-Motorized Boating	
1 to 2 days	15%
3 to 4 days	14%
5 to 6 days	10%
7 to 8 days	8%
9 to 10 days	9%
11 to 15 days	10%
16 to 20 days	6%
21 to 30 days	11%
31 to 40 days	2%
41 to 100 days	12%
101 to 250 days	4%
<b>(n=288)</b>	<b>100%</b>
<b>Average</b>	<b>24 days</b>
<b>Median</b>	<b>10 days</b>

Reasons for Participating in Non-Motorized Boating	
Recreation	46%
Leisure and relaxation	40%
To enjoy nature	38%
For fitness	24%
Participate in another activity*	24%
As a family activity	23%
Physical/mental challenge	14%
As a social activity	11%
Convenient and easy	11%
Non-polluting and no gasoline	10%
Quiet	8%
Less expensive	7%
To reach other boat	1%
For competition	0.7%
<b>(n=288)</b>	
<b>Sums to over 100 percent because respondents identified multiple reasons.</b>	

Household Income	Percent
Under \$25,000	6%
\$25,000 up to \$50,000	15%
Over \$50,000 up to \$100,000	36%
Over \$100,000 up to \$200,000	24%
Over \$200,000	7%
NA	12%
<b>100%</b>	

Most Used Non-Motorized Boat Type (Regularly Used Boats Only)	
Inflatable raft	33.0%
Recreational kayak	17.0%
Sea or touring kayak	9.2%
Hard-shell canoe	8.2%
Rowing boat or shell	7.3%
Inflatable kayak	5.3%
Other inflatable	3.9%
Small sailboat	2.9%
Whitewater kayak	2.9%
Inflatable transom boat	2.4%
Other kayaks	2.4%
Other boats	1.5%
Other canoes	1.5%
Sailboard or kiteboard	1.5%
Paddleboat	1.0%
<b>(n=288)</b>	<b>100.0%</b>
<b>(All kayaks = 36.8 percent)</b>	

\* Fishing, hunting, scuba diving, snorkeling, photography, camping, bird-watching, etc.



Appendix C

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# Active-User Internet Survey

## C. Active-User Internet Survey

The non-random, active-user internet survey was conducted between December 13, 2006, and February 16, 2007.

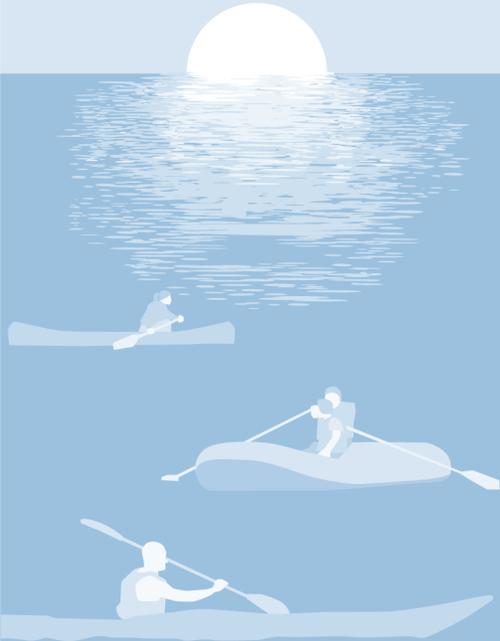
This Appendix includes:

- A description of the active-user Internet survey approach
- A printed copy of the web-based survey instrument (**Exhibit C.1**)
- A sample email to non-motorized boating clubs to inform them of the survey (**Exhibit C.2**)
- A summary of fourteen survey question responses (**Exhibit C.3**).

The active-user Internet survey instrument was essentially identical to the Statewide Random Survey. The only changes were to remove the screening question, add a background/description, and revise the first two questions to allow for those that regularly use, but do not own, non-motorized boats.

DBW placed a link to the active user survey on the front of DBW's web page, [www.dbw.ca.gov](http://www.dbw.ca.gov), on December 12, 2006, until February 16, 2007. Starting on December 13, 2006, NewPoint Group emailed non-motorized boating clubs and organizations throughout the State to introduce the survey and to ask them to inform their members about the survey. Organizations were also told that members that were not online could contact NewPoint Group to obtain a paper-copy of the survey. NewPoint Group also informed several involved individuals, and two web pages related to whitewater boating: [dreamflows.com](http://dreamflows.com) and [TheAmericanRiver.com](http://TheAmericanRiver.com). We contacted the following organizations regarding the active user survey:

- Bay Area Sea Kayakers
- California Dragon Boat Association and local dragon boat clubs
- California Kayak Friends
- Chico Paddleheads
- Explore North Coast
- Full Sail Windsports Club
- International Naples Sabot Association
- Kern Valley River Council
- Norcal Kayak Anglers
- Northern California Outrigger Canoe Association and Northern California outrigger clubs
- Richmond Plungers
- Rio Vista Windsurf Association



- River City Paddlers
- River Touring Section, Los Angeles Sierra Club
- San Diego Kayak Club
- San Diego Windsurfing Association
- San Francisco Board Sailing Association
- San Francisco Sierra Club River Touring Section
- Sequoia Paddling Club
- Shasta Paddlers
- Southern California Kiteboarding Association
- Southern California Outrigger Racing Association and Southern California outrigger clubs
- Southern California Surf Kayakers
- The El Toro International Yacht Racing Association
- US Rowing and California rowing clubs
- Valley Wide Kayak Club
- Western Sea Kayakers.

The survey link was posted on several organizations web pages and non-motorized boating listserves. Club representatives from a number of clubs contacted NewPoint Group to clarify the intent of the survey and to obtain additional information prior to informing their members.

The active-user survey was designed to allow easy click or fill-in responses, and a one-click submission. Completed answers were sent in an anonymous email to NewPoint Group. We imported each survey response into a master Excel file, with one row per survey response. As surveys were processed, we removed duplicates and partially completed surveys (which occurred if the respondent submitted the survey before completing it, or submitted the survey more than once).

There were a total of 1,518 completed surveys. The vast majority of respondents, 1,481, were from within California. An additional 37 respondents were from out-of-state, but boated in California. Most (1,400) respondents owned one or more non-motorized boats; however, there were 118 respondents that regularly participated in boating, but used club-owned or rental boats.

The statewide random telephone survey and the active-user Internet survey were two very distinct, and incomparable, surveys. The statewide random telephone survey represented a random sampling of California households. Because this was a random survey of households statewide, we could extrapolate results to the California population overall, with a given level of statistical accuracy. This was not the case with the active-user Internet survey.

The active-user survey was a self-selected sample of active and interested boaters. Only boaters that were informed about the survey through clubs, non-motorized boating list servers, and other boaters, or that may have “happened across the survey” on DBW’s web page, participated. Also, among the thousands of non-motorized boaters that were made aware of the survey, only a subset of them completed the survey.

The types of boats represented in the active-user survey were shaped by the clubs and user-groups that were most heavily represented in the active-user survey: sea kayakers, whitewater boaters, sailboarders, and rowers. For example, nine (9) percent of active user respondents used sailboards as their most-used boat. This was clearly far higher than the actual percentage of Californian’s that used sailboards in 2006. The active-user respondents that owned inflatable boats were generally a subset of whitewater boaters that participated in the survey, and that were whitewater rafters, rather than whitewater kayakers. This active-user response reflected only a small subset of the types of inflatable boating among statewide random telephone survey respondents.

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We included the active-user survey in our study because we wanted to identify the characteristics, and perspectives, of the most involved (enthusiastic) subset of the non-motorized boating public. While this subset may include many of the types of boaters one sees most often on many of California waterways, it does **not** represent the typical California non-motorized boat **owner**.

In total, while these active-user surveys are not statistically representative of the California population of non-motorized boaters, they do provide a robust picture of the perspectives of non-motorized boating enthusiasts. The active-user survey responses were presented to attendees at the special interest group meetings, and were utilized in helping to write Section 3: Facilities and Waterways for Non-Motorized Boating.



## Non-Motorized Boating in California

### Active-User Survey

### Questionnaire

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#### SURVEY BACKGROUND

The California Department of Boating and Waterways (Cal Boating) is conducting its first-ever study of non-motorized boating in California. Cal Boating is a State agency whose mission is to provide safe and convenient access to California's public waterways, and leadership in promoting the public's right to safe, enjoyable, and environmentally sound recreational boating. A major focus for Cal Boating is to provide grants and loans for boating facilities such as launch ramps and marinas. While Cal Boating has supported several non-motorized boating initiatives over the last few years, Cal Boating-funded facilities are typically directed toward motorized boating.

As non-motorized boating activities have become increasingly popular in California and elsewhere, Cal Boating is considering providing more support to this growing boating community. As a first step in further planning and potential support for non-motorized boating, Cal Boating seeks to understand how many non-motorized boaters there are in California, the boats they own, and where and why they boat.

The results of this study will be used to help the Department to (1) understand how many, and what types, of non-motorized boats there are in California, (2) understand how economically important non-motorized boating is to California, and (3) plan future facilities to meet the needs of non-motorized boaters. This study is **not** associated with California Department of Motor Vehicles boat registration enforcement.

Relatively little is known either nationally, or within California, about non-motorized boats and boating, and we need non-motorized boaters' input. As part of the overall non-motorized boating study, we are conducting this "active-user" Internet Survey of non-motorized boaters. Those who boat regularly will have a better awareness of facility needs, will spend the most money on boating, and will have the best perspectives on how to improve non-motorized boating in California.

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If you have one or more non-motorized boats, as defined below in question #1, please take the time (about 15 to 20 minutes) to complete and submit this active-user survey. All of your responses will be kept strictly confidential, and will only be presented in the aggregate form, together with other responses. The results of this study will be available in late 2007 at the California Department of Boating and Waterways web page, [www.dbw.ca.gov](http://www.dbw.ca.gov).

**Special note for non-motorized boating participants who do not own a boat (for example, members of outrigger canoe clubs, rowing clubs, and dragon boat clubs):** Even though you do not own a particular type of non-motorized boat, we are interested in your opinions and expenditures on non-motorized boating. Please complete the survey. For those boat type(s) that you regularly use, but do not own, check the specific boat type in Question #2, but put a zero for the number of boats. Answer the remaining questions for the non-motorized boat types that you use most often, even if you do not own them.

We value your time and thank you very much for your assistance in this important study. If you have questions about the survey, please contact Wendy Pratt at [wendypratt@newpointgroup.com](mailto:wendypratt@newpointgroup.com).

**Directions and clarifications are provided in bold type.**

#### USER SURVEY

1. There are many kinds of non-motorized boats, and we are interested in identifying specific types of boats you, or someone in your household, **currently owns**. *Our definition of non-motorized boats means any boat **not** currently registered with a vessel registration (CF) number from the California Department of Motor Vehicles. This non-motorized boat definition includes: (1) boats propelled by paddles or oars, and usually without a motor, such as canoes, kayaks, inflatable boats and rafts, rowing boats (including row boats, shells, sculls, dories, or driftboats), and other types of manually propelled boats; (2) sailboats 8 feet in length or shorter, and usually without a motor; and (3) sailboards or kiteboards. Non-motorized boats **do not** include “toy like” blow-up rafts and other non-durable water toys.* Do you or anyone in your household, own one or more of the following non-motorized boats, within this definition?

**(Indicate all that apply)**

- A. Canoe
- B. Kayak
- C. Inflatable Boat or Raft
- D. Small Sailboat (8 feet in length or shorter)
- E. Rowing Boat (including row boat, shell, scull, dory, or driftboat)
- F. Sailboard or Kiteboard
- G. Other type of non-motorized boat
- H. I don't own a non-motorized boat, but I regularly participate in non-motorized boating through a club or other organization.

*If you do not own, or regularly use, a non-motorized boat, you do not need to complete the remainder of this survey.*

**Complete question #2 for each category of non-motorized boat that you indicated above. If the specific type of non-motorized boat that you own is not identified, please fill in the appropriate “Other” entry.**

2. Please identify the specific type of non-motorized boat, and how many of that type of boat that you, or someone in your household, owns.

(Indicate all that apply)

**A. Canoes**

- Hard-shell canoe – How many?
- Inflatable canoe – How many?
- Other specialty canoes:
  - Hunting – How many?
  - Fishing – How many?
  - Outrigger – How many?
  - Whitewater – How many?
  - Other:  – How many?

**B. Kayaks**

- Recreational (flat-top plastic) kayak – How many?
- Inflatable kayak – How many?
- Whitewater kayak – How many?
- Sea or touring kayak – How many?
- Other specialty kayaks:
  - Fishing kayak – How many?
  - Sailing kayak – How many?
  - Surfski – How many?
  - Surf kayak – How many?
  - Scuba kayak – How many?
  - Folding kayak – How many?
  - Other:  – How many?

**C. Inflatable Boats and Rafts**

- Inflatable raft – How many?
- Inflatable cataraft – How many?
- Inflatable transom boat or tender – How many?
- Other inflatable boat:  – How many?

**D. Sailboats**

- Small sailboat (8 feet or shorter, such as an “El Toro”) – How many?

**E. Rowing Boats**

- Rowing shell or scull – How many?
- Row boat/dory/driftboat/tender – How many?

**F. Sailboard/Kiteboard**

- Sailboard – How many?
- Kiteboard – How many?

**G. Other Non-Motorized Boats**

- Dragon boat – How many?
- Paddle/peddle boat – How many?
- Other non-motorized boat:  – How many?

3. Did you use your non-motorized boat (or boats) in the last five years?

- Yes
- No

**(If “no”, please skip to question #39)**

**Answer question #4 if, from question #2, you own more than one type of non-motorized boat. If you own only one type of non-motorized boat, skip to question #5.**

4. If you own more than one type of non-motorized boat, which boat type do you use most often? (for example, “whitewater kayak” or “rowboat”)

**If you have multiple non-motorized boats, answer questions #5 to #15 for the one type of non-motorized boat that you use most often.**

5. How many years have you owned this type of non-motorized boat?

6. How many days a year do you typically use this type of non-motorized boat?

7. On what waterway do you use your non-motorized boat most often?

8. Please indicate any of the following that best describe why you used your non-motorized boat at this waterway:

**(Indicate all that apply)**

- Close to home, or convenient access
- Facilities (parking, restrooms, day-use, camping)
- Water and/or flow conditions (for example: rapids, wave conditions, wind conditions, reliable water flows, calm water, variety, clean water, etc.)
- Not crowded
- Visiting location for another reason (sightseeing, hiking, biking, camping, vacation, etc.)
- Access to another activity (hunting, fishing, scuba/snorkeling, birdwatching, etc.)
- Features or destinations (beach, shoreline, amenities, boating trails)
- Other:

9. Are there improvements or facility needs that would support non-motorized boating at this waterway?

Examples of facility needs include restrooms, parking, signage, boating trails, storage, etc.

- Yes
- No

**(If "no", please skip to question #11)**

10. If yes, what are they?

**(Indicate all that apply)**

- Improved access to water
- Maintain water level/water releases
- Parking
- Restrooms
- Showers
- Freshwater boat wash
- Low-impact facilities
- Boating trails
- Docks
- Floats/launch ramps
- Beach area
- Storage
- Signage
- Improved water quality
- Picnic areas
- Camping
- Motor-boat free zones
- Whitewater park
- Other:

11. Is there a second waterway where you use your non-motorized boat?

- Yes
- No

**(If "no", please skip to question #16)**

12. If yes, what is the name of that waterway?

13. Why do you boat at this second waterway?

**(Identify up to three reasons)**

1.
2.
3.

14. Are there improvements or facility needs that would support non-motorized boating at this second waterway?

- Yes
- No

**(If "no", please skip to question #16)**

15. If yes, what are they?

**(Identify up to three improvements or facility needs)**

1.
2.
3.

16. Is there a California waterway that you avoid using, or would use more often, except that there are problems or facility needs at the waterway?

- Yes
- No

**(If "no", please skip to question #19)**

17. If yes, what is the name of that waterway?

18. If yes, please identify the problems or facility needs at that waterway:

**(Indicate all that apply)**

- Lack of access for non-motorized boats
- Overcrowding
- Inconsistent water flows and/or problems related to dam releases
- Inadequate parking
- Lack of or inadequate restrooms
- Water conditions (water quality, obstructions, rapids, currents, low water levels, floating debris, etc.)
- Reckless boaters
- Other:

**Answer questions #19 to #24 only if you have more than one type of non-motorized boat, as identified in question #2. For example, if you have a sea kayak and a whitewater kayak, this would count as two types of boats. If you have six whitewater kayaks, this counts as only one type of boat. If you have only one type of boat, skip to question #25.**

19. What is the non-motorized boat type, from question #2, that you use the second most often?

20. How many years have you owned this second type of non-motorized boat?

21. How many days a year do you typically use this second type of non-motorized boat?

**If you own a third type of non-motorized boat, answer questions #22 to #24, if not, skip to question #25.**

22. If you have more than two non-motorized boat types, from question #2, what is the non-motorized boat type that you use the third most often?

23. How many years have you owned this third type of non-motorized boat?

24. How many days per year do you typically use this third type of non-motorized boat?

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25. There are many reasons why people use non-motorized boats. Please indicate the reason (or multiple reasons) why you participate in non-motorized boating.

**(Indicate all that apply)**

- Recreation
- Leisure and relaxation
- As a social activity
- As a family activity
- For the physical and/or mental challenge
- For fitness
- For competition
- To enjoy nature
- To participate in another activity such as fishing, hunting, snorkeling, or scuba diving
- Other:

26. Do you have safety concerns related to non-motorized boating?

- Yes
- No

**(If "no", please skip to question #28)**

27. If yes, what are they?

**(Indicate all that apply)**

- Interactions with motorized vessels
- Inexperienced or unprepared boaters
- Problems related to overcrowding
- Boating in unsafe water conditions (rapids, waves, rocks, debris, unpredictable flows, tides, currents, cold water, high water, cold water)
- Boating in unsafe weather conditions (wind, cold, heat, lightning)
- Boaters not using PFDs (personal floatation devices)
- Using unsafe boats or equipment (ropes, paddles, improper boat, no helmet)
- Waterborne illness/poor water quality
- Other safety concerns:

28. This question relates to annual spending for durable goods and services related to non-motorized boating, **not including boating trips**. In the last 12 months, how much have you, and your household, spent on non-motorized boating equipment, supplies and services, for each of the following categories:

**(Provide your best estimate)**

- \$  New boats
- \$  Used boats
- \$  Repairs
- \$  Boating supplies and equipment (racks, paddles, PFDs, ropes, parts, pumps, bags, sails, carts, helmets, etc.)
- \$  Other gear (apparel, footwear, accessories)
- \$  Memberships
- \$  Classes, instruction, events
- \$  Books, magazines, videos, DVDs
- \$  Other annual expenses:

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**The next several questions are about your most recent non-motorized boating trip in California, within the last five years. This could be a one-day outing, or a several-day trip.**

29. First, what is the name of the waterway that you went to on your most recent trip?

30. If you have more than one type of non-motorized boat, from question #2, which boat type did you use on this trip?

31. Was non-motorized boating the primary purpose of this trip?  
 Yes  
 No

**(If "yes", please skip to question #34)**

32. If no, what was the primary purpose of this trip? **(Indicate one)**

- Camping
- Motorized boating activity
- Hiking or biking
- Fishing or hunting
- Sightseeing
- Participating in another event (family gathering, vacation, business, sporting event)
- Other:

33. If no, what percent of your activity time (excluding travel) was spent on non-motorized boating?

34. How many days was this trip?

35. How many hours one-way did it take you to travel to your destination?

36. How many miles one-way from your home is this destination?

37. How many people traveled with you, in your immediate group, on this trip?

38. For this most recent non-motorized boating trip, how much did you and your immediate traveling group spend for the following categories:

**(Provide your best estimate)**

- \$  Fuel
- \$  Parking
- \$  Entrance and/or launch fees
- \$  Shuttle services
- \$  Grocery and convenience stores
- \$  Retail, gift, specialty, or other stores
- \$  Restaurants
- \$  Motels/hotels
- \$  Campgrounds
- \$  Other:

39. How many years have you been involved in some form of non-motorized boating?

- Less than 5 years
- 5 to 9 years
- 10 to 14 years
- 15 to 20 years
- More than 20 years

40. In the next five years, how many days per year do you think you will participate in non-motorized boating, as compared to the last five years? **(If “a lot more” or “a little more”, answer question #41, then go to question #43; if “a lot less” or “a little less”, skip to question #42; if “about the same”, skip to question #43)**

- A lot more
- A little more
- About the same
- A little less
- A lot less

41. If you answered a lot more, or a little more, why will you be increasing your participation?

**(Indicate all that apply)**

- More free time
- Enjoy the activity
- Non-motorized boating is replacing another hobby/activity
- As a social activity/my friends are doing it
- As a family activity/my family is doing it
- My skill level has improved
- To try new types of non-motorized boating
- Other:

42. If you answered a lot less, or a little less, why will you decrease participation?

**(Indicate all that apply)**

- Not enough time
- No longer interested
- Lack of access to an appropriate waterway
- Lack of facilities or inadequate facilities
- Logistics make it too difficult
- Expense
- Health/illness/injury
- Too crowded
- Other:

43. Are you a member of any non-motorized boating clubs or organizations?

- Yes
- No

**(If “no”, please skip to question #45)**

44. If yes, please list all the non-motorized boating organizations or clubs that you belong to: **(Identify up to five organizations or clubs)**

1.

2.

3.

4.

5.

**The last several questions will help us understand who participates in non-motorized boating activities. Remember, your answers are confidential, and will only be presented in aggregate form.**

45. What is your age?

- Under 18
- 18-25
- 25-34
- 35-44
- 45-55
- 56-65
- Over 65

46. What is your zip code?

47. What is your gender?

- Male
- Female

48. What is your marital status?

- Single
- Married

49. How many people are in your household?

50. How many people in your household participate in non-motorized boating?

51. What is your ethnicity?

- Caucasian
- Black
- Latin
- Native American
- Asian
- Other

52. What level of education have you completed?

- High school
- Some college
- B.A. or equivalent
- Advanced degree (MS, MA, PhD, MD, JD, etc.)

53. What was your household's combined income for 2005?

- Under \$25,000
- \$25,000 up to \$50,000
- Over \$50,000 up to \$100,000
- Over \$100,000 up to \$200,000
- Over \$200,000

54. Please provide any additional comments or suggestions related to non-motorized boating or non-motorized boating facilities in California:

Comments?

---

***Thank you for your participation!***

Click here to submit survey

---

**Exhibit C.2**

**A Sample Email To Non-Motorized Boating Clubs To Inform Them Of The Survey (2006)**

Dear [Club Representative] -- I am working on a project for the California Department of Boating and Waterways (DBW) non-motorized boating in California. As a first step in further planning and potential support for non-motorized boating, DBW seeks to understand how many non-motorized boaters there are in California, the boats they own, and where and why they boat. Another important component of the project is to determine the economic impact of non-motorized boating in California. As part of the overall non-motorized boating study, we are conducting an "active-user" survey of non-motorized boaters. The survey is now online at the DBW web page, <http://www.dbw.ca.gov> - the link to the survey is in the middle of the page.

Please let all of your [club] members know about the survey - we would like to get input from as many non-motorized boaters as possible. Also, if you have members that are not online, but that would like to do the survey, have them contact me, and I will mail them a paper copy.

If you have any questions, please feel free to contact me.

Thank you,

Wendy Pratt

NewPoint Group  
2555 Third Street, Suite 215  
Sacramento, CA 95818  
(916) 442-9227  
[www.newpointgroup.com](http://www.newpointgroup.com)

**Exhibit C.3**  
**Summary of Active-User Survey Respondents (2006) (n=1,518)**

<b>Boater Gender</b>	
Males	68%
Females	28%
NA	4%
<b>100%</b>	

<b>Boater Marital Status</b>	
Married	57%
Single	38%
NA	5%
<b>100%</b>	

<b>Used a Boat in Last 5 Years?</b>	
Yes	99%
No	1%

<b>Education</b>	<b>Percent</b>
High School	2%
Some College	17%
BA or Equivalent	38%
Advanced Degree	39%
NA	4%
<b>100%</b>	

<b>Number of Boats Owned</b>	
0	8%
1	15%
2	16%
3 to 4	24%
5 to 6	17%
7 to 10	14%
11 to 15	5%
16 or more	2%
<b>100%</b>	
<b>Average</b>	<b>4.5 boats</b>
<b>Median</b>	<b>3 boats</b>

<b>Years Owned Most-Used Non-Motorized Boat</b>	
1 to 2	21%
3 to 4	22%
5 to 6	17%
7 to 8	11%
9 to 10	13%
11 to 14	4%
15 to 20	7%
Over 20 years	5%
<b>(n=1,409) 100%</b>	
<b>Average</b>	<b>9.5 years</b>
<b>Median</b>	<b>7 years</b>

<b>Number of Boaters in Household</b>
<b>1.8</b>

<b>Age</b>	<b>Percent</b>
Under 18	1%
18 to 24	3%
25 to 34	11%
35 to 44	23%
45 to 55	35%
56 to 65	19%
Over 65	4%
NA	3%
<b>100%</b>	

<b>Ethnicity</b>	<b>Percent</b>
Caucasian	82.4%
Asian	5.5%
Black	0.5%
Latin	1.7%
Native American	0.7%
Other	3.7%
NA	5.5%
<b>100%</b>	

<b>Years Involved in Non-Motorized Boating</b>	
Less than 5 years	17%
5 to 9 years	20%
10 to 14 years	15%
15 to 20 years	13%
Over 20 years	32%
NA	3%
<b>100%</b>	

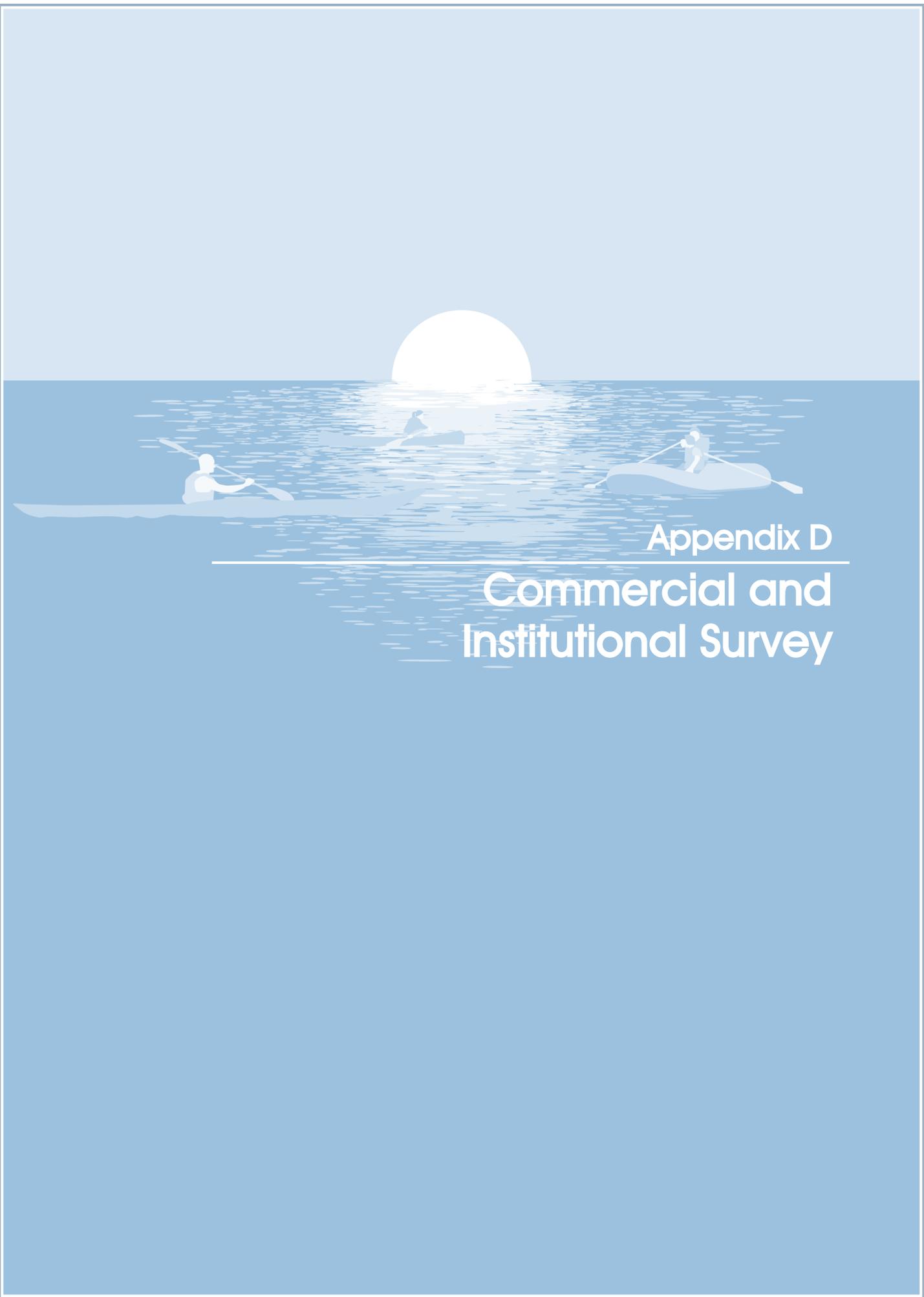
<b>Days per Year of Non-Motorized Boating</b>	
1 day	2%
2 to 10 days	10%
11 to 20 days	12%
21 to 40 days	22%
41 to 60 days	16%
61 to 80 days	9%
81 to 100 days	8%
101 to 150 days	11%
151 to 200 days	6%
201 to 250 days	2%
251 to 300 days	2%
301 to 365 days	1%
<b>(n=1,506) 100%</b>	
<b>Average</b>	<b>73 days</b>
<b>Median</b>	<b>50 days</b>

<b>Reasons for Participating in Non-Motorized Boating</b>	
Recreation	92%
Physical/mental challenge	82%
To enjoy nature	82%
For fitness	81%
Leisure and relaxation	76%
As a social activity	72%
As a family activity	37%
For competition	33%
Participate in another activity*	18%
Camping	2%
Quiet	2%
Educating others	1%
Non-polluting and no gasoline	1%
Convenient and easy	0.5%
Less expensive	0.4%
As a job	0.3%
Breast cancer survival team	0.2%
Cultural	0.1%
To reach other boat	0.1%
Transportation	0.1%
<b>(n=1,518)</b>	
<b>Sums to over 100 percent because respondents identified multiple reasons.</b>	

<b>Household Income</b>	<b>Percent</b>
Under \$25,000	3%
\$25,000 up to \$50,000	10%
Over \$50,000 up to \$100,000	35%
Over \$100,000 up to \$200,000	34%
Over \$200,000	10%
NA	8%
<b>100%</b>	

<b>Most Used Non-Motorized Boat Type</b>	
Sea/touring kayak	20%
Whitewater kayak	18%
Rowing shell or scull	12%
Sailboard	9%
Inflatable raft	7%
Outrigger canoe	6%
Recreational kayak	5%
Dragon boat	4%
Kiteboard	4%
Fishing kayak	3%
Canoe	3%
Inflatable kayak	2%
Kayak (unspecified)	2%
Surfski	1%
Other kayaks	1%
Whitewater canoe	1%
Cataraft	1%
Row boat	1%
Inflatable other	0.4%
Small sailboat	0.2%
Other boats	0.4%
<b>100%</b>	

\* Fishing, hunting, scuba diving, snorkeling, photography, bird-watching, etc.



Appendix D

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# Commercial and Institutional Survey

## D. Commercial and Institutional Survey

The commercial and institutional survey of organizations involved in non-motorized boating was intended to identify the number and types of non-motorized boats owned by these organizations, as well as the number of participants, and costs of participation. In addition, the survey included several questions about observed trends in non-motorized boating, facility needs, and safety issues. We conducted the survey between November 2006 and May 2007.

This appendix provides a description of the survey approach, and the following:

- **Exhibit D.1**, a paper version of the survey
- **Exhibit D.2**, a summary of the results of eleven survey questions
- **Exhibit D.3**, a summary of participation and expenditure results by region
- **Exhibit D.4**, a summary of boats and boat types
- **Exhibit D.5**, a listing of 243 commercial and institutional entities providing non-motorized boating rental, instruction, and/or guided trips
- **Exhibit D.6**, a summary of commercial whitewater participation on eleven California rivers.

### Survey Approach

There were two initial tasks for this survey. The first task was to identify entities to be surveyed, and the second task was to develop the survey instrument. We developed a list of commercial entities that provided non-motorized boating services through directories, Internet research, and lists of outfitters provided by government agencies. DBW provided a list of aquatic centers to be surveyed, many of which offer non-motorized boating activities. We reviewed web pages, and obtained addresses, telephone numbers, and emails for a final list of 243 organizations. We removed many companies that were initially identified on various lists, because they were no longer in business (particularly windsurfing businesses). We removed a number of entities from the lists, because they were retail-only and did not provide non-motorized boating services. The final list of 243 commercial and institutional entities includes the vast majority of all non-motorized boating service providers, and ten (10) yacht clubs that we contacted regarding small sailboats. We incorporated small sailboat information from yacht clubs into club boating results. This overall list is likely missing some small rental businesses.



NewPoint Group implemented the survey by telephone, mail, and email. We contacted all 243 entities multiple times, by both telephone and email. Respondents were given the option of completing the survey over the telephone, or being sent the survey (email or postal mail) to complete and return. We made up to four contacts with entities that did not respond, and had a final response rate of 46 percent, 112 completed surveys. For the 131 entities that did not complete surveys<sup>a</sup>, we conducted additional Internet research to identify the region in which

they were located, the type of services they provided (rental, instruction, guided trips), and the average cost of each type of service. These region and service-specific extrapolations are reflected in the participation and expenditure data provided in Exhibit D.3, and used in the economic analysis in Section 4 of this report. Similarly, in Exhibit D.4, the number of boats, by boat type, for commercial and institutional entities, are based on the number of boats by type for the 112 survey respondents, extrapolated to the entire population.

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<sup>a</sup> Analysis of the survey responses was done confidentially, with no organization identification on the compiled surveys (unless provided by the respondent). However, we separately kept track of which of the 243 entities completed surveys. This allowed us to re-contact those that had not completed surveys, and finally, to research non-respondents so that we could accurately extrapolate participation and expenditures to the full population.

**Non-Motorized Boating in California  
Commercial and Institutional Rentals, Instruction, and Guided-Trips Survey  
Questionnaire**

**BACKGROUND**

The California Department of Boating and Waterways (Cal Boating) is conducting its first ever study of non-motorized boating in California.

As non-motorized boating activities have become increasingly popular in California and elsewhere, Cal Boating is considering providing more support to this growing boating community. As a first step in further planning and potential support for non-motorized boating, Cal Boating seeks to understand how many non-motorized boats and boaters there are in California, the types of non-motorized boats, and where they are used.

The results of this study will be used to help Cal Boating to: (1) understand how economically important non-motorized boating is to California; and (2) potentially ultimately plan future facilities to meet the needs of non-motorized boaters. This study is **not** associated with California Department of Motor Vehicles boat registration enforcement.

Relatively little is known either nationally, or within California, about non-motorized boats and boating, and we need non-motorized boaters' input. Those businesses and organizations that are involved with non-motorized boating may have a good awareness of facility needs, and perspective on how to improve non-motorized boating in California. In order to determine the number of non-motorized boats in California, and the economic impact of non-motorized boating, we need to know not only about private-owner boating, but also about participation in non-motorized boating rentals, classes, and guided trips. The focus of this survey is to gather information about these three categories of non-motorized boating activities.

As part of this overall study, we are conducting three surveys: (1) a statewide random survey of individuals that own one, or more, non-motorized boats; (2) an Internet survey of active-users of non-motorized boats; and (3) this email and telephone survey of commercial, non-profit, and institutional non-motorized boating service providers.

**DIRECTIONS**

**Please complete this survey if your business or organization provides one or more of the following: (1) rentals, (2) on-the water classes or instruction, and/or (3) guided trips, for any non-motorized boat types, as defined below. If you have multiple office or store locations, please complete a separate survey for each location.**

All of your responses will be kept strictly confidential, and will only be presented in the aggregate form, together with other responses. The results of this study will be available late 2007 at the California Department of Boating and Waterways web page, <http://www.dbw.ca.gov>.

**The survey is divided into five sections. Everyone should complete SECTIONS 1 and 5. Complete SECTION 2 if you provide rentals, SECTION 3 if you provide on-the-water classes or instruction, and SECTION 4 if you provide guided trips.**

For purposes of this study, "non-motorized boat" is defined as: *any boat not currently registered with a vessel registration (CF) number from the California Department of Motor Vehicles. This non-motorized boat definition includes: (1) boats propelled by paddles or oars (and usually without a motor), such as canoes, kayaks, inflatable boats and rafts, rowing boats (including row boats, shells, sculls, dories, driftboats, and tenders), and other types of manually propelled boats; (2) small sailboats 8 feet in length or shorter (and usually without a motor); and (3) sailboards and kiteboards. Non-motorized boats do not include "toy like" blow-up rafts and other non-durable water toy, nor do non-motorized boats include innertubes or fisherman float tubes. Finally, non-motorized boats do not include normal surfboards, beach boogie boards, or river boards.*

Text boxes will expand to fit your answers. Please **TAB** to the next item when you have completed your answer.

Directions and clarifications are provided in bold type. Thank you in advance for your time. If you have any questions, please call or email Wendy Pratt at (916) 442-9227, or [wendypratt@newpointergroup.com](mailto:wendypratt@newpointergroup.com).

**SECTION 1 – TO BE COMPLETED BY ALL RESPONDENTS**

1. Please identify your type of business entity or organization. **(Indicate all that apply)**
  - 1 Commercial business
  - 2 Non-profit organization
  - 3 Institutional organization (school, university)
  - 4 Local government
  - 5 Private boating club
  - 6 Aquatic center
  - 7 Self-employed guide or instructor
  - 8 Other: \_\_\_\_\_ 9
  
2. How many years has your business or entity provided services and/or products related to non-motorized boats? \_\_\_\_\_ 10
  
3. How many non-motorized boating-related business office or store locations does your entity or organization have in California? \_\_\_\_\_ 11 **If you have more than one California location, enter the county of one location in question #4, and complete the survey for that location. Please complete a separate survey for each business office or store location.**
  
4. What is the county in which your business/entity office or store is located? \_\_\_\_\_ 12
  
5. Are non-motorized boating-related services or products your primary business or organizational focus?
  - 13 Yes  14 No **(If “yes”, skip to question #7)**
  
6. If no, what is the primary business or organizational focus? **(Indicate one)**
  - 15 Motorized boats and/or sailboats greater than 8 feet in length
  - 16 Outdoor or retail sporting goods, in general
  - 17 Scuba diving, fishing, or hunting services
  - 18 Boating education
  - 19 Recreational activities, in general
  - 20 Other: *(please specify)* \_\_\_\_\_ 21

**Question #7 will help us identify how many non-motorized boats are in California. Please identify each type of non-motorized boat for which your organization has any number of rental, instructional, or guided-trip boats, and the number of boats of that type. You may use the “Other” category if your specific boat type is not identified.**

7. Please identify the specific type of non-motorized boat, and total number of that type of boat in your fleet of rental, instructional, and/or guided-trip non-motorized boats in 2006. Do not include boats within your retail sales inventory (unless they are also used for rental, instruction, or guided trips). **(Indicate all that apply)**
  - A. Canoes**
    - 22 Hard-shell canoe – How many? \_\_\_\_\_ 23
    - 24 Inflatable canoe – How many? \_\_\_\_\_ 25
    - 26 Other specialty canoes:
      - 27 Hunting – How many? \_\_\_\_\_ 28
      - 29 Fishing – How many? \_\_\_\_\_ 30
      - 31 Outrigger – How many? \_\_\_\_\_ 32
      - 33 Whitewater – How many? \_\_\_\_\_ 34
      - 35 Other: \_\_\_\_\_ 36
      - How many? \_\_\_\_\_ 37

Text boxes will expand to fit your answers. Please TAB to the next item when you have completed your answer.

**B. Kayaks**

- <sub>38</sub> Recreational kayak – How many? \_\_\_\_\_ <sub>39</sub>
- <sub>40</sub> Sit-on-top kayak – How many? \_\_\_\_\_ <sub>41</sub>
- <sub>42</sub> Inflatable kayak – How many? \_\_\_\_\_ <sub>43</sub>
- <sub>44</sub> Whitewater kayak – How many? \_\_\_\_\_ <sub>45</sub>
- <sub>46</sub> Sea and touring kayak – How many? \_\_\_\_\_ <sub>47</sub>
- <sub>48</sub> Other specialty kayaks:
  - <sub>49</sub> Fishing kayak – How many? \_\_\_\_\_ <sub>50</sub>
  - <sub>51</sub> Sailing kayak – How many? \_\_\_\_\_ <sub>52</sub>
  - <sub>53</sub> Surfski – How many? \_\_\_\_\_ <sub>54</sub>
  - <sub>55</sub> Surf kayak – How many? \_\_\_\_\_ <sub>56</sub>
  - <sub>57</sub> Scuba kayak – How many? \_\_\_\_\_ <sub>58</sub>
  - <sub>59</sub> Folding kayak – How many? \_\_\_\_\_ <sub>60</sub>
  - <sub>61</sub> Racing kayak – How many? \_\_\_\_\_ <sub>62</sub>
  - <sub>63</sub> Other: \_\_\_\_\_ <sub>64</sub> – How many? \_\_\_\_\_ <sub>65</sub>

**C. Inflatable Boats and Rafts**

- <sub>66</sub> Inflatable raft – How many? \_\_\_\_\_ <sub>67</sub>
- <sub>68</sub> Inflatable cataraft – How many? \_\_\_\_\_ <sub>69</sub>
- <sub>70</sub> Inflatable transom boat and tender – How many? \_\_\_\_\_ <sub>71</sub>
- <sub>72</sub> Other inflatable boat \_\_\_\_\_ <sub>73</sub> – How many? \_\_\_\_\_ <sub>74</sub>

**D. Sailboats**

- <sub>75</sub> Small sailboat (8 feet in length or shorter) – How many? \_\_\_\_\_ <sub>76</sub>

**E. Rowing Boats**

- <sub>77</sub> Rowing shell or scull – How many? \_\_\_\_\_ <sub>78</sub>
- <sub>79</sub> Row boat/dory/driftboat/tender – How many? \_\_\_\_\_ <sub>80</sub>

**F. Sailboard/Kiteboard**

- <sub>81</sub> Sailboard – How many? \_\_\_\_\_ <sub>82</sub>
- <sub>83</sub> Kiteboard – How many? \_\_\_\_\_ <sub>84</sub>

**G. Other Non-Motorized Boats**

- <sub>85</sub> Dragon boat – How many? \_\_\_\_\_ <sub>86</sub>
- <sub>87</sub> Paddle/peddle boat – How many? \_\_\_\_\_ <sub>88</sub>
- <sub>89</sub> Stand-up paddle surfboard – How many? \_\_\_\_\_ <sub>90</sub>
- <sub>91</sub> Other type of non-motorized boat: \_\_\_\_\_ <sub>92</sub> – How many? \_\_\_\_\_ <sub>93</sub>

8. How often do you typically replace non-motorized boats in your fleet?

- <sub>94</sub> Within 1 year
- <sub>95</sub> Once a year
- <sub>96</sub> Every 2 to 3 years
- <sub>97</sub> Every 4 to 5 years
- <sub>98</sub> After more than 5 years

Text boxes will expand to fit your answers. Please **TAB** to the next item when you have completed your answer.

**SECTION 2 – TO BE COMPLETED BY ORGANIZATIONS THAT PROVIDE RENTAL SERVICES FOR NON-MOTORIZED BOATS**

**RENTALS:** If your organization or entity provides rentals of non-motorized boats, answer questions #9 through #13, if not, skip to SECTION 3.

9. If your organization/entity provides rentals for any type of non-motorized boat, please complete the following for each non-motorized boat category that you rent:

Non-Motorized Boat Category	Number of Rental Participants in 2006 (if data are not available for 2006, provide data for 2005)	Average Rental Cost per Participant (in dollars)
A. Canoes	_____ 99	_____ 100
B. Kayaks	_____ 101	_____ 102
C. Inflatable Boats and Rafts	_____ 103	_____ 104
D. Small Sailboats (8 feet in length or shorter)	_____ 105	_____ 106
E. Rowing Boats (including row boat, shell, scull, dory, driftboat, and tender)	_____ 107	_____ 108
F. Sailboards and Kiteboards	_____ 109	_____ 110
G. Other type of non-motorized boats	_____ 111	_____ 112

10. Approximately what percentage of your rental customers rent more than one time per year? (provide your best estimate)

- <sup>113</sup> 0 to 25 percent
- <sup>114</sup> 26 to 50 percent
- <sup>115</sup> 51 to 75 percent
- <sup>116</sup> 76 to 100 percent
- <sup>117</sup> Don't know

11. Do you provide on-site rentals for specific waterways?  <sup>118</sup> Yes  <sup>119</sup> No (If "no", skip to question #13)

12. If yes, please identify the waterways for which you provide rentals. (list all) \_\_\_\_\_ <sup>120</sup>

13. Please briefly describe a typical rental customer. (For example: families, couples, groups or individuals; locals, from out-of-town or out-of-state; novice or experienced, etc.).  
\_\_\_\_\_ <sup>121</sup>

Text boxes will expand to fit your answers. Please TAB to the next item when you have completed your answer.

**SECTION 3 – TO BE COMPLETED BY ORGANIZATIONS THAT PROVIDE ON-THE-WATER CLASSES AND INSTRUCTION FOR NON-MOTORIZED BOATS**

**CLASSES AND INSTRUCTION:** If your organization or entity provides on-the-water classes or instruction for any type of non-motorized boats, answer questions #14 through #18, if not, skip to SECTION 4.

14. If your organization/entity provides on-the-water classes or instruction for any type of non-motorized boat, please indicate the types of on-the-water classes or instruction provided: **(Indicate all that apply)**

- 122 Beginning-level instruction
- 123 Intermediate-level instruction
- 124 Advanced-level instruction
- 125 Non-motorized boating safety/first aid instruction
- 126 Swift-water rescue
- 127 Instruction for guides and/or instructors
- 128 Private classes
- 129 Other: \_\_\_\_\_ 130

15. Please complete the following for each non-motorized boat category for which you provide instruction:

Non-Motorized Boat Category	Number of Class Participants in 2006 (if data are not available for 2006, provide data for 2005)	Average Class Cost per Participant (in dollars)
<b>A. Canoes</b>	_____ 131	_____ 132
<b>B. Kayaks</b>	_____ 133	_____ 134
<b>C. Inflatable Boats and Rafts</b>	_____ 135	_____ 136
<b>D. Small Sailboats</b> (8 feet in length or shorter)	_____ 137	_____ 138
<b>E. Rowing Boats</b> (including row boat, shell, scull, dory, driftboat, and tender)	_____ 139	_____ 140
<b>F. Sailboards and Kiteboards</b>	_____ 141	_____ 142
<b>G. Other type of non-motorized boats</b>	_____ 143	_____ 144

16. Approximately what percent of instructional customers participate in more than one class per year? **(provide your best estimate)**

- 145 0 to 25 percent
- 146 26 to 50 percent
- 147 51 to 75 percent
- 148 76 to 100 percent
- 149 Don't know

17. Please list the waterways where you provide classes or instruction. **(list all)** \_\_\_\_\_ 150

18. Please briefly describe a typical instructional customer. (For example: families, couples, groups or individuals; locals, from out-of-town or out-of-state; novice or experienced, etc.)

\_\_\_\_\_ 151

Text boxes will expand to fit your answers. Please TAB to the next item when you have completed your answer.

**SECTION 4 – TO BE COMPLETED BY ORGANIZATIONS THAT PROVIDE  
GUIDED TRIPS FOR NON-MOTORIZED BOATS**

**GUIDED TRIPS:** If your organization or entity provides guided-trips for any category of non-motorized boats, answer questions #19 through #24, if not, skip to SECTION 5.

19. Please identify all California waterway locations of your guided trips: (List all)

\_\_\_\_\_ <sup>152</sup>

20. What is the length of your California guided trips? (Indicate all that apply)

<sup>153</sup> Half-day or less

<sup>154</sup> One-day

<sup>155</sup> Two-days

<sup>156</sup> Three or more days

21. Do you also provide guided trips outside of California?  <sup>157</sup> Yes  <sup>158</sup> No

22. Please complete the following for each non-motorized boat category for which you provided guided trips in California:

Non-Motorized Boat Category	Number of Participants on Guided Trips in 2006 (if data are not available for 2006, provide data for 2005)	Average Trip Cost per Participant (in dollars)
<b>A. Canoes</b>	_____ <sup>159</sup>	_____ <sup>160</sup>
<b>B. Kayaks</b>	_____ <sup>161</sup>	_____ <sup>162</sup>
<b>C. Inflatable Boats and Rafts</b>	_____ <sup>163</sup>	_____ <sup>164</sup>
<b>D. Small Sailboats</b> (8 feet in length or shorter)	_____ <sup>165</sup>	_____ <sup>166</sup>
<b>E. Rowing Boats</b> (including row boat, shell, scull, dory, driftboat, and tender)	_____ <sup>167</sup>	_____ <sup>168</sup>
<b>F. Sailboards and Kiteboards</b>	_____ <sup>169</sup>	_____ <sup>170</sup>
<b>G. Other type of non-motorized boats</b>	_____ <sup>171</sup>	_____ <sup>172</sup>

23. Approximately what percent of guided trip customers participate in more than one trip per year? (provide your best estimate)

<sup>173</sup> 0 to 25 percent

<sup>174</sup> 26 to 50 percent

<sup>175</sup> 51 to 75 percent

<sup>176</sup> 76 to 100 percent

<sup>177</sup> Don't know

24. Please briefly describe a typical guided trip customer. (For example: families, couples, groups or individuals; locals, from out-of-town or out-of-state; novice or experienced, etc.)

\_\_\_\_\_ <sup>178</sup>

Text boxes will expand to fit your answers. Please TAB to the next item when you have completed your answer.

**SECTION 5 – TO BE COMPLETED BY ALL RESPONDENTS**

25. Are there improvements or facility needs that would support non-motorized boating on California waterways? Examples of facility needs include restrooms, parking, signage, boating trails, storage, etc.  
 179 Yes  180 No (If "no", skip to question #27)

26. If yes, please identify up to five waterway(s) and their facility needs or improvements, below:

Waterway	Facility Needs or Improvements
1. _____ 181	_____ 182
2. _____ 183	_____ 184
3. _____ 185	_____ 186
4. _____ 187	_____ 188
5. _____ 189	_____ 190

27. Do you have safety concerns related to non-motorized boating?  191 Yes  192 No  
 (If "no", skip to question #29)

28. If yes, what are they? (Indicate all that apply)

- |  |   |
|--|---|
| <input type="checkbox"/> 193 Interactions with motorized vessels   | <input type="checkbox"/> 197 Boating in unsafe weather conditions (wind, cold, heat, lightning)         |
| <input type="checkbox"/> 194 Inexperienced or unprepared boaters   | <input type="checkbox"/> 198 Boaters not using PFDs   |
| <input type="checkbox"/> 195 Problems related to overcrowding  | <input type="checkbox"/> 199 Using unsafe boats or equipment (ropes, paddles, improper boat, no helmet) |
| <input type="checkbox"/> 196 Boating in unsafe water conditions (rapids, waves, rocks, debris, unpredictable flows, tides, currents, cold water, high water, cold water) | <input type="checkbox"/> 200 Waterborne illness/poor water quality                                      |
|  | <input type="checkbox"/> 201 Other safety concerns: _____ 202   |

29. From your perspective, what, if any, changes or trends in participation, attitudes, or interest-levels have occurred in non-motorized boating over the last several years?  
 \_\_\_\_\_ 203

30. What is your title or position? (Indicate one)

- |  |   |
|--|---|
| <input type="checkbox"/> 204 Owner or co-owner               | <input type="checkbox"/> 207 Staff            |
| <input type="checkbox"/> 205 Manager                         | <input type="checkbox"/> 208 Other: _____ 209 |
| <input type="checkbox"/> 206 President or executive director |   |

31. Please provide any additional comments or suggestions related to non-motorized boating or non-motorized boating facilities in California:  
 \_\_\_\_\_ 210

We value your time and thank you very much for your assistance in this important study.

**OPTIONAL:** This survey is confidential. However, if you would like us to contact you to further discuss non-motorized boating, you may provide your name and telephone number, and a good time to reach you, below:

\_\_\_\_\_

If you return this survey by mail, please send it to: Wendy Pratt, NewPoint Group, 2555 Third Street, Suite 215, Sacramento, CA 95818

Exhibit D.2

Summary of Active-User Commercial/Institutional Respondents in California (2006) (n=112)

Type of Entity*	
Commercial	72%
Non-profit	19%
Institutional	17%
Local gov	6%
Private	1%
Aquatic center	9%
Guide or instructor	4%
First Aid Instruction	1%
<i>* Adds to over 100 as some businesses have multiple designations</i>	

Number of Boats in Fleets	
Canoes	942
Recreational kayaks	2,908
Sit-on-top kayaks	2,194
Sea/touring kayaks	1,864
Inflatable kayaks	1,175
Whitewater kayaks	450
Other kayaks	279
Inflatable rafts	3,500
Other inflatable boats	56
Small sailboats	433
Rowing boats	279
Sailboards	743
Kiteboards	74
Other boats	195
<b>Total**</b>	<b>15,062</b>
<i>* Sit-on-top kayaks were identified separately from recreational kayaks for this survey</i>	
<i>** From 112 non-respondents and 131 non-responders</i>	

Replace Boats in Fleet	
Within 1 year	3%
Once a year	6%
2 to 3 years	27%
4 to 5 years	20%
More than 5 years	45%
<b>100%</b>	

Focus of Business	
Non-Motorized Boating	72%
Motorized or Large Sail Boats	1%
Outdoor or Retail	7%
Boating Education	6%
Recreational Activities	8%
Other	6%
<b>100%</b>	

Number of Business Locations	
1	77%
2	14%
3	2%
4	1%
5	4%
6	2%
<b>100%</b>	

Position of Survey Respondent	
Owner or co-owner	40%
Manager	31%
President or exec director	14%
Staff	4%
Other	11%
<b>100%</b>	

Types of Instruction	
Beginning	99%
Intermediate	86%
Advanced	55%
Safety first aid	47%
Swift water rescue	22%
For guides or instructors	40%
Private classes	44%
Other	23%
<i>* Adds to over 100 as most entities teach multiple types of classes</i>	

Years in Business	
1 to 2	6%
3 to 4	7%
5 to 6	6%
7 to 8	4%
9 to 10	9%
11 to 14	12%
15 to 20	11%
Over 20 years	45%
<b>100%</b>	

	Percent of Repeat Customers		
	Rental	Instruction	Guided Trips
0 to 25 percent	51%	53%	84%
26 to 50 percent	29%	21%	10%
51 to 75 percent	12%	16%	4%
76 to 100 percent	5%	4%	0%
Don't know	3%	6%	2%
	<b>100%</b>	<b>100%</b>	<b>100%</b>

Guided Trips Outside California (n=68)	
Yes	28%
No	72%
<b>100%</b>	

	Non-Motorized Boat Activities	
	Completed Surveys	No Response**
Rental	43	60
Instruction	73	49
Guided Trips	68	74
<b>Total</b>	<b>112</b>	<b>121</b>
<i>* Does not sum as many businesses provide multiple activities</i>		
<i>** Excluding ten yacht clubs</i>		

**Exhibit D.3**

**Commercial and Institutional Total Participants and Expenditures in California (2006)**

Activity	Statewide		North Coast Region		San Francisco Region		Central Coast Region	
	Participants	Expenditures	Participants	Expenditures	Participants	Expenditures	Participants	Expenditures
Rental	208,902	\$5,572,356	45,522	\$1,269,050	13,628	\$357,340	12,008	\$398,232
Instruction	87,093	\$7,786,644	4,290	\$305,783	18,802	\$1,484,708	5,146	\$401,561
Guided Trips	243,827	\$39,431,769	20,711	\$2,001,817	12,692	\$2,158,095	9,250	\$825,550
<b>Total</b>	<b>539,822</b>	<b>\$52,790,769</b>	<b>70,523</b>	<b>\$3,576,650</b>	<b>45,122</b>	<b>\$4,000,143</b>	<b>26,404</b>	<b>\$1,625,343</b>

Activity	South Coast Region		San Diego Region		Northern Interior Region		Sacramento Basin Region	
	Participants	Expenditures	Participants	Expenditures	Participants	Expenditures	Participants	Expenditures
Rental	62,836	\$1,387,076	18,825	\$497,775	375	\$9,375	24,383	\$1,003,758
Instruction	21,314	\$2,134,241	28,279	\$1,670,578	1,218	\$136,190	5,906	\$1,366,675
Guided Trips	24,167	\$3,379,778	5,875	\$1,014,725	12,360	\$2,418,040	92,338	\$16,221,704
<b>Total</b>	<b>108,317</b>	<b>\$6,901,095</b>	<b>52,979</b>	<b>\$3,183,078</b>	<b>13,953</b>	<b>\$2,563,605</b>	<b>122,627</b>	<b>\$18,592,137</b>

Activity	Central Valley Region		Eastern Sierra Region		Southern Interior Region	
	Participants	Expenditures	Participants	Expenditures	Participants	Expenditures
Rental	30,000	\$620,000	325	\$9,750	1,000	\$20,000
Instruction	388	\$104,658	200	\$11,000	1,550	\$171,250
Guided Trips	66,234	\$11,399,060	200	\$13,000	-	\$ -
<b>Total</b>	<b>96,622</b>	<b>\$12,123,718</b>	<b>725</b>	<b>\$33,750</b>	<b>2,550</b>	<b>\$191,250</b>

**Exhibit D.4**

**Estimated Number of Non-Motorized Boats by Type in Commercial and Institutional Fleets in California (2006)**

Boat Type	Number
Canoes	942
Kayaks	8,870
<i>Recreational kayak</i>	2,908
<i>Sit-on-top kayak</i>	2,194
<i>Inflatable kayak</i>	1,175
<i>Whitewater kayak</i>	450
<i>Sea/touring kayak</i>	1,864
<i>Other kayak</i>	279
Inflatable rafts and boats	3,526
Small sailboats	433
Rowing boats and shells	279
Sailboards and Kiteboards	817
Other Boats	195
<b>Total</b>	<b>15,062</b>

**Exhibit D.5**  
**Non-Motorized Boating Commercial and Institutional Entities (2006)**

Page 1 of 5

	Company/Organization	Website	Region	Telephone
1	A B Seas Kayaks	montereykayak.com	CC	831-647-0147
2	ABK Boardsports Windsurfing Camps	abkboardsports.com		n/a
3	Access to Sailing	accesstosailing.org		562-433-0561
4	Action Watersports	actionwatersports.com	SC	310-827-2233
5	Action Whitewater Adventures	riverguide.com	SB	800-453-1482
6	Adventure Center	raftingtours.com		541-488-2819
7	Adventure Connection	raftcalifornia.com	SB	800-226-6060
8	Adventure Rents	adventurerents.com	NC	707-884-4FUN
9	Adventure Sports	adventuresportsonline.com	CC	415-EZ-Sport
10	Adventure Sports Unlimited, Inc.	asudoit.com	CC	831-458-3648
11	Adventures By The Sea	adventuresbythesea.com	CC	831-372-1807
12	Alfredo's Beach Club	alfredosbeachclub.com	SC	562-434-1542
13	All Craft	oaklandallcraft.com	SF	510 444-7115
14	Allen's Kayaks	allenskayaks.com	SD	858-488-5599
15	All-Outdoors California Whitewater Rafting	aorafting.com	SF	800-247-2387
16	Alpine Training Services	alpinets.com	SC	626-434-3636
17	American Red Cross	sacsierraredcross.org	SB	916-368-3130
18	American River Raft Rentals	raftrentals.com	SB	916-635-6400
19	American River Recreation	arrafting.com	SB	800-333-7238
20	American River Touring Association	arta.org/non_profit.htm	CC	800/323-2782
21	American Whitewater Expeditions	americanwhitewater.com	SC	800-825-3205
22	Aqua Adventures	aqua-adventures.com	SD	800-269-7792
23	Aquasports	islandkayaking.com	SC	800-773-2309
24	ASD	asdwindurfing.com	SF	877-348-8486
25	Atascadero Kayak & Sail	fastkayak.com	SC	805-441-7463
26	Avalon Boat Stand (Jay's Rent-a-boat)	catalina.com/rent-a-boat.html	SC	310-510-0455
27	B& D Sports	n/a	SF	415-364-5995
28	Bay Area Outdoor Adventure Club	outdooradventureclub.com	SF	415-954-7190
29	Berkeley Boardsports	boardsports.com	SF	510-843-9283
30	Beyond Limits Adventures	rivertrip.com	CV	800-234-RAFT (7238)
31	Big Bear Marina	bigbearmarina.com	SI	909-866-3218
32	Bigfoot Rafting Company	bigfootrafting.com	NI	800-722-2223
33	Bio Bio Expeditions	bbxrafting.com	NC	800.246.7238
34	Birch Circle Adventures	birchcircle.com	SF	415-459-7717
35	Blue Waters Kayaking	bwkayak.com	NC	415-669-2600
36	Boardsports School Alameda	boardsportsschool.com	SF	415-385-1224
37	Bodega Bay Kayak/Bodega Bay Surf Shack	bodegabaykayak.com <i>or</i> bodegabaykurf.com	NC	707-875-8899, 707-875-3944
38	Burke's Canoe Trips	burkescanoetrips.com	NC	707-887-1222
39	Cabrillo Beach Yacht Club*	cbyc.org	SC	310-519-1694
40	Cache Canyon Whitewater River Trips	cachecanyon.com	SB	800-796-3091
41	Cal Adventures	caladventures.com	SF	n/a
42	Cal Sailing Club	cal-sailing.org	SF	none
43	Caldera Kayaks	calderakayak.com	ES	760-934-1691
44	California Canoe & Kayak	calkayak.com	SF, SB	800-366-9804
45	California Kayak Academy	n/a	NC	707-433-6707
46	California Maritime Academy Sailing Program	cmaathletics.org	SF	707-654-1050
47	California River Rafting	california-river-rafting.com	SB	800-523-5531
48	California State University, Northridge Aquatic Center	http://rtm.csun.edu	SC	818-677-3202
49	California Watersports	carlsbadlagoon.com	SD	760-434-3089
50	California Windsurfing	californiawindsurfing.com	SF	650-594-0335
51	California Yacht Club*	calyachtclub.com	SC	310-823-4567

## Exhibit D.5

## Non-Motorized Boating Commercial and Institutional Entities (2006) (continued)

Page 2 of 5

	Company/Organization	Website	Region	Telephone
52	Canyon Raft Rentals	canyonraftrentals.com	SB	530-823-0931
53	Captain John's Marina	captainjohnsmarina.com	SI	909-866-6478
54	Captain Kirk's Windsurfing	captainkirks.com	SC	310-833-3397
55	Carlsbad Paddle Sports	carlsbadpaddle.com	SD	760-434-8686
56	Carpinteria City Parks and Ocean Recreation	ci.carpinteria.ca.us <i>or</i> ci.carpinteria.ca.us/parks_rec/index.shtml	SC	805-684-5405
57	Catalina Kayak Adventures	catalinakayaks.com	SC	310-510-2229
58	Catch a Canoe and Bicycles Too (at Standford Inn by the Sea)	catchacanoe.com	NC	800-331-8884
59	CBOC (Chili Bar Outdoor Center) Whitewater	https://secure.adventuresports.com/wraft/cboc	SB	800-356-2262
60	Central Coast Kayaks	centralcoastkayaks.com	SC	805-773-3500
61	Central Coast Outdoors	centralcoastoutdoors.com	CC	805-528-1080
62	Channel Islands Kayak Center	cikayak.com	SC	805-644-9699
63	China Cove Kayak Adventures	chinacovekayadventures.com	SD	949-632-4694
64	Chuck Richards Whitewater, Inc.	chuckrichards.com	CV	760-376-3776, 7600379-4444
65	City Kayak	citykayak.com	SF	415-357-1010
66	City of Oakland, Office of Parks & Recreation, Boating Department	oaklandnet.com/parks <i>or</i> oaklandnet.com/parks/programs/boating.asp	SF	510-238-2196
67	City of Santa Rosa Recreation & Parks Department, Howarth Park	santarosarec.com <i>or</i> http://ci.santa-rosa.ca.us/default.aspx?PageId=23	NC	707-543-3282
68	Clavey River Equipment	clavey.com	NC	707-766-8072
69	Coastal Kayak Fishing	kayakfishing.com	SC	310-457-3012
70	Coronado Yacht Club*	coronadoyc.org	SD	619-435-1848
71	Crown Cove Aquatic Center	swccd.edu <i>or</i> swccd.edu/4thLevel/index.asp?L3=292	SD	619-575-6176
72	CSU, Channel Islands	n/a	SC	n/a
73	CSU Chico, Adventure Outings	n/a	SB	n/a
74	CSU Chico, Forebay Aquatic Center	aschico.com/?Page=536	SB	530-624-6919
75	CSUMB Boating Education Program	montereyboating.org	CC	831-582-4271
76	Current Adventures Kayak School	currentadventures.com	SB	888-452-9254
77	Dana Point Jet Ski and Kayak Center	danapointjetski.com	SC	949-661-4947
78	Dana Point Youth and Group Facility	ocparks.com/dpyg	SC	949-923-2215
79	Davenport SurfSail	davenportsurfsail.com	CC	831-429-6051
80	Del Rey Surf & Sport	delreysurfandsport.com	SC	310-305-3023
81	Delta Windsurf Company	deltawindsurf.ezstores.net	SB	916-777-2299
82	DeRiemer Adventure Kayaking	adventurekayaking.com	SB	530-295-0830
83	Descanso Beach Ocean Sports, Inc.	kayakcatalinaisland.com	SC	310-510-1226
84	Destination Wilderness	wildernesstrips.com		541-549-1336
85	Disabled Sports USA Far West	dsusafw.org	SB	916-722-6447
86	Earthtrek Expeditions	earthtrekexpeditions.com	SB	530-642-1900
87	ECHO River Trips	echotrips.com	SF	510-652-1600
88	Encinal Yacht Club*	encinal.org	SF	510-522-3272
89	Environmental Traveling Companions	etctrips.org	SF	415-474-7662, ext 15
90	Eskape! Sea Kayaking	eskapekayak.com	CC	831-476-5385
91	Family Kayak Adventure Center	familykayak.com	SD	619-282-3520
92	Far West Outdoors	farwestoutdoors.com	SB	530-887-1963
93	Feather River College, Outdoor Recreation Leadership Program	http://frc.edu/stock/Department/index.html	SB	800-442-9799, ext. 275
94	Fluid Dynamics Kayaking	kayakclass.com	SB	530-344-8373
95	Gold Rush Whitewater Rafting	goldrushriver.com	SB	530-295-8235
96	Half Moon Bay Kayak Co.	hmbkayak.com	NC	650-773-6101
97	Healing Waters	hwaters.org	SF	415-552-1190
98	High Country Expeditions	highcountryexpeditions.com		541-822-8288

## Exhibit D.5

## Non-Motorized Boating Commercial and Institutional Entities (2006) (continued)

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	Company/Organization	Website	Region	Telephone
99	Hike Bike Kayak	hikebikekayak.com	SD	858-551-9510
100	Humboats Kayak Adventures	humboats.com	NC	707-443-5157
101	Humboldt State University, Center Activities	humboldt.edu/~cntract	NC	707-826-3357
102	Jack London Aquatic Center	jlac.org	SF	510-208-6060
103	James Henry River Journeys	riverjourneys.com	SF	415-868-1836
104	Kayak Connection	kayakconnection.com	SC	831-479-1121
105	Kayak Horizons	kayakhorizons.com	NC	805-772-6444
106	Kayak Tahoe	kayaktahoe.com	SB	530.544.2011
107	Kayak Zak	kayakzak.com	NC	707-498-1130
108	Kern River Outfitters	kernrafting.com	CV	800-323-4234
109	Kern River Tours	kernrivertours.com	CV	760-379-4616
110	Kings River Expeditions	kingsriver.com	CV	559-233-4881
111	King's Sport & Tackle	guernevillesport.com/rentals.htm	NC	707-869-2156
112	Kite Wind Surf	kitewindsurf.com	SF	510-522-WIND
113	Klamath River Outfitters	klamathriveroutfitters.com/	NI	530-469-3349
114	Klamath River Resort Inn	klamathriverresortinn.com	NI	530-493-2735
115	Kokopelli River Center	kokopelliriverguides.com		541-201-7694
116	Koolriver Adventure Tours	koolriveradventure.com	SC	800-931-8999
117	La Jolla Kayak	lajollakayak.com	SD	858-459-1114
118	La Jolla Kayak Fishing	kayak4fish.com	SD	619-461-7172
119	Lake Cunningham, City of San Jose	sanjoseca.gov/prns or lakecunningham.org	SF	408-277-4319
120	Lake Francis Resort	lakefrancisrv.com/info/boatrent.htm	SB	530-692-1700
121	Lake Merritt Boating Center	oaklandnet.com/parks/facilities/lmbc.asp	SF	510-238-2196
122	Lake Siskiyou Camp Resort	lakesis.com	NI	530-926-2618
123	Leo Robbins Sailing and Kayaking Center, City of Ventura	cityofventura.net	SC	805-643-3612
124	Liquid Fusion Kayak Company	liquidfusionkayak.com	SD	619-992-6602
125	Living Waters Recreation	livingwatersrec.com	NI	800-994-RAFT
126	Long Beach Windsurf Center	windsurfceneter.com	SC	562-433-1014
127	Malibu Ocean Sports	hookedonkayaks.com	SC	562-592-0800
128	Malibu Surf Shack	malibusurfshack.com	SC	310-456-8508
129	Marble Mountain Ranch	marblemountainranch.com	NI	800-Klamath (552-6284)
130	Mariah Wilderness Expeditions	mariahwe.com	SB	530-626-6049
131	McBroom and Co Packers and Guides	mcbroompackers.com	NI	530-462-4617
132	Miramar Adventures	miramar-adventures.com	SC	206-322-6559
133	Mission Bay Aquatic Center	missionbayaquaticcenter.com	SD	858-488-1000
134	Momentum River Expeditions	momentumriverexpeditions.com		866 663 5628
135	Monterey Bay Kayaks	montereybaykayaks.com	CC	800-649-5357
136	Mother Lode River Center	malode.com	SB	800-427-2387
137	Mountain & River Adventures	mtnriver.com	CV	760-376-6553
138	Newport Aquatic Center	newportaquaticcenter.com	SC	949-646-7725
139	Noah's River Adventures	noahsrafting.com		800-858-2811
140	Nonesuch Whitewater	n/a	NC	707-823-6603
141	North Coast Adventures	northcoastadventures.com	NC	707-822-2989
142	North Country Raft Rental	raftredding.com	SB	530-244-4281
143	North Rim Adventure Sports	northrimadventure.com	SB	530-345-2453
144	O.A.R.S. Inc.	oars.com	CV	800-346-6277
145	OEX Dive & Kayak Center	oexpress.com	SD	619-758-9531
146	Off The Beach	n/a	NC	415-868-9445
147	Offshore Watersports	owsrentals.com	SC	562-436-1996
148	Orange Torpedo Trips, Inc.	orangetorpedo.com		800-635-2925
149	Osprey Outdoors Kayak School	ospreykayak.com	NI	530-926-6310

## Exhibit D.5

## Non-Motorized Boating Commercial and Institutional Entities (2006) (continued)

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	Company/Organization	Website	Region	Telephone
150	Otter Bar Lodge Kayak School	otterbar.com	NI	530.462.4772
151	Outback Adventures	outbackadventures.com	SF	408-551-0588
152	Outdoor Adventures, UC Davis	http://campusrecreation.ucdavis.edu/outdoor_adventures	SB	530-752-1995
153	Outdoors Unlimited, UC San Francisco	outdoors.ucsf.edu	SF	415-476-2078
154	Pacific Coast Kayak Adventures	bigsurkayakadventures.net	CC	831-601-0547
155	Pacific Corinthian Youth Foundation	pcyf.org	SC	805-985-0660
156	Pacific River Supply	pacificriversupply.com	SF	510-223-3675
157	Paddle Power Kayaks	paddlepowerkayaks.com	SC	949-675-1215
158	Paddle Sports of Santa Barbara	www.kayaksb.com	SC	888-254-2094
159	Paddle Up Kayak	paddleup.com	NC	707 953-8800
160	Peak Adventures	peakadventures.org	SB	916-278-6321
161	Pleasure Point Marina, LLC	pleasurepointbbl.com	SI	909-866-2455
162	Point Reyes Outdoors	pointreyesoutdoors.com	NC	415-663-8192
163	Point Reyes Outdoors	pointreyesoutdoors.com	NC	415-663-8192
164	Rancheria Enterprises	rancheriaenterprises.com		559-893-3234
165	Recreational Equipment Inc.	rei.com	SB, SF, SD, SC	800-426-4840
166	Redwoods and Rivers Rafting Company	redwoods-rivers.com	NC	800-429-0090
166	Rescue Source	rescuesource.com	SB	800-457-3728
167	Resort Watersports	resortwatersports.com	SD	800-585-0747
168	Resort Watersports	resortwatersports.com	CV	800-585-0747
169	Resort Watersports	resortwatersports.com	SD	800-585-0747
170	Richmond Yacht Club*	richmondyc.org	SF	510 237-2821
171	River and Rock Adventures	riverandrockadventures.com		866-748-7625
172	River City Oar and Paddle	n/a	SB	n/a
173	River Country Rafting	klamathrafting.com	NI	530-493-2207
174	River Dancers	riverdancers.com	NI	530-926-3517
175	River Journey	riverjourney.com	CV	800-292-2938
176	River Otter Adventures	whitewaterotter.com	SB	877-687-RAFT
177	River Rat Raft Rentals	river-rat.com	SB	916-966-6777
178	River Runners	riverrunnersusa.com	SC	818-887-5310 S.CA 530-622-5110 N.CA
179	River Travel Center	mcn.org/a/rivers		800-882-7238
180	River's Edge Kayak & Canoe Trips	riversedgekayakandcanoe.com	NC	800-345-0869
181	Riversend Rafting & Adventure	riversendrafting.com	CV	866-360-RAFT
182	Rock Kayak Co. LLC	rockkayak.com	CC	805-772-2906
183	Rock-N-Water	rocknwater.com	SB	800-738-0555
184	Rocky Point King Harbor	rockypointfun.com	SC	310-374-9858
185	Rogue Klamath River Adventures	rogueklamath.com		800-231-0769
186	Rogue River Journeys	roguerivertrips.com		866-213-7754
187	Rubicon Whitewater Adventures	rubiconadventures.com	NC	707-887-2452
188	Russian River Outfitters	russianriveroutfitters.com	NC	877-RR-KAYAK
189	Sacramento State Aquatic Boating & Safety Center	csusaquaticcenter.com	SB	916-278-2842
190	San Diego Bike and Kayak Tours Inc.	sandiegobikeandkayaktours.com	SD	858-437-1224
191	San Diego Sailing Center	kayaksforsale.com	SD	858-488-0651
192	San Diego Yacht Club*	sdyc.org	SD	619-221-8400
193	San Francisco State University Sailing Program	http://online.sfsu.edu/~mjarrow/index.htm	SF	415-405-2449
194	San Francisco Yacht Club*	sfyc.org	SF	415-435-9133
195	San Jose State Rowing	n/a	SF	
196	Santa Barbara Adventure Company	sbadventureco.com	SC	805-898-0671
197	Santa Barbara Kayaks	sbkayaks.com	SC	805-564-1136
198	Save The Bay	savesfbay.org	SF	510-452-9261

## Exhibit D.5

## Non-Motorized Boating Commercial and Institutional Entities (2006) (continued)

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	Company/Organization	Website	Region	Telephone
199	Sea Trek	seatrekkayak.com	SF	415-488-1000
200	Seaforth Boat Rentals	seaforthboatrental.com	SD	619-223-1681
201	Sequoia Yacht Club*	sequoiayc.org	SF	650-361-8538
202	Sheldon Kiteboarding	sheldonkiteboarding.com	SB	707-374-3053
203	Sierra Mac River Trips	sierramac.com	CV	800-457-2580
204	Sierra Outdoor Center	sierraoutdoorcenter.com	SB	530-885-1844
205	Sierra South Mountain Sports	sierrasouth.com	CV	760-376-3745
206	Solid Rock and Raft Youth Adventures	solidrockandraft.com	SB	530 629-2944
207	Sonoma Outfitters	sonomaoutfitters.com	NC	707-528-1920
208	Southwind Kayak Center	southwindkayaks.com	SC	949-261-0200
209	St. Francis Yacht Club*	stfyc.com	SF	415-563-6363
210	Stanford Sailing Summer Camp Program	stanfordsailing.org	SF	650-723-2811
211	Stockton Sailing Club	stocktonsc.org	CV	209-951-5600
212	Subsea Tours & Kayaks	subseatours.com	NC	805-772-3349 or 9463
213	Sunrise Mountain Sports	sunrisemountainsports.com	SF	925-447-8330 (store) 925-245-9481 (kayak center)
214	Sunshine Rafting Adventures	raftadventure.com	CV	800-829-7238
215	Tahoe Adventure Company	tahoeadventurecompany.com	SB	530-913-9212
216	Tahoe City Kayak	tahoeckayak.net	SB	866-816-4945
217	Tahoe Paddle & Oar	tahoeppaddle.com	SB	530-581-3029
218	Tahoe Whitewater Tours	gowhitewater.com	SB	530-581-2441
219	The Sports Exchange	truckeesportsexchange.com	SB	530-582-4510
220	Tributary Whitewater Tours	whitewatertours.com	SB	800-672-3846
221	Trinity River Rafting	trinityriverrafting.com	SB	530-623-3033
222	Turtle River Rafting	turtleriver.com	NI	800-726-3223
223	UC Irvine, Boating Program	campusrec.uci.edu or campusrec.uci.edu/outdoor/index.asp	SC	949-824-5346
224	UCLA Marina Aquatic Center	recreation.ucla.edu/mac	SC	310-823-0048
225	UCSC Community Boating Center	ucsc.edu/opers/boating	CC	n/a
226	United States Adaptive Recreation Center	usarc.org	SI	909-584-0269
227	UP Sports	upsportsoc.com	SC	949-443-5161
228	Vallejo Yacht Club*	vyc.org	SF	707-643-1254
229	Ventura Harbor	venturaharbor.com	SC	805-642-8538
230	Venture Quest	kayaksantacruz.com	CC	831-427-2267
231	W.E.T. River Trips	raftwet.com	SB	888-723-8938
232	Westwind Adventures	kayakmartinez.com	SF	925-229-KAYAK
233	Whitewater Adventures	gotwhitewater.com	SB	800-97RIVER (74837)
234	Whitewater Connection	whitewaterconnection.com	SB	800-336-7238
235	Whitewater Excitement	whitewaterexcitement.com	SB	800-750-2386
236	Whitewater Voyages	whitewatervoyages.com	SF	800-400-7238
237	Wilderness Adventures	wildrivertrips.com	NI	530-887-8363
238	Wind Walker Boardsports	wind-walker.com	NC	707-874-2331
239	Windsurf Diablo	n/a	SF	925-778-6350
240	Wolf Creek Wilderness	wolfcreekwilderness.com	SB	530-477-2722
241	Xstreamline Sports	xstreamline.com	SF	310-514-9514
242	YMCA, Central Valley Chapter	centralvalleyYMCA.org	CV	559-335-2382
243	Zephyr Whitewater Expeditions	zrafting.com	CV	800-431-3636

\* Yacht club estimated boats and participation are included in totals for clubs in Section 2 and Exhibit B-2

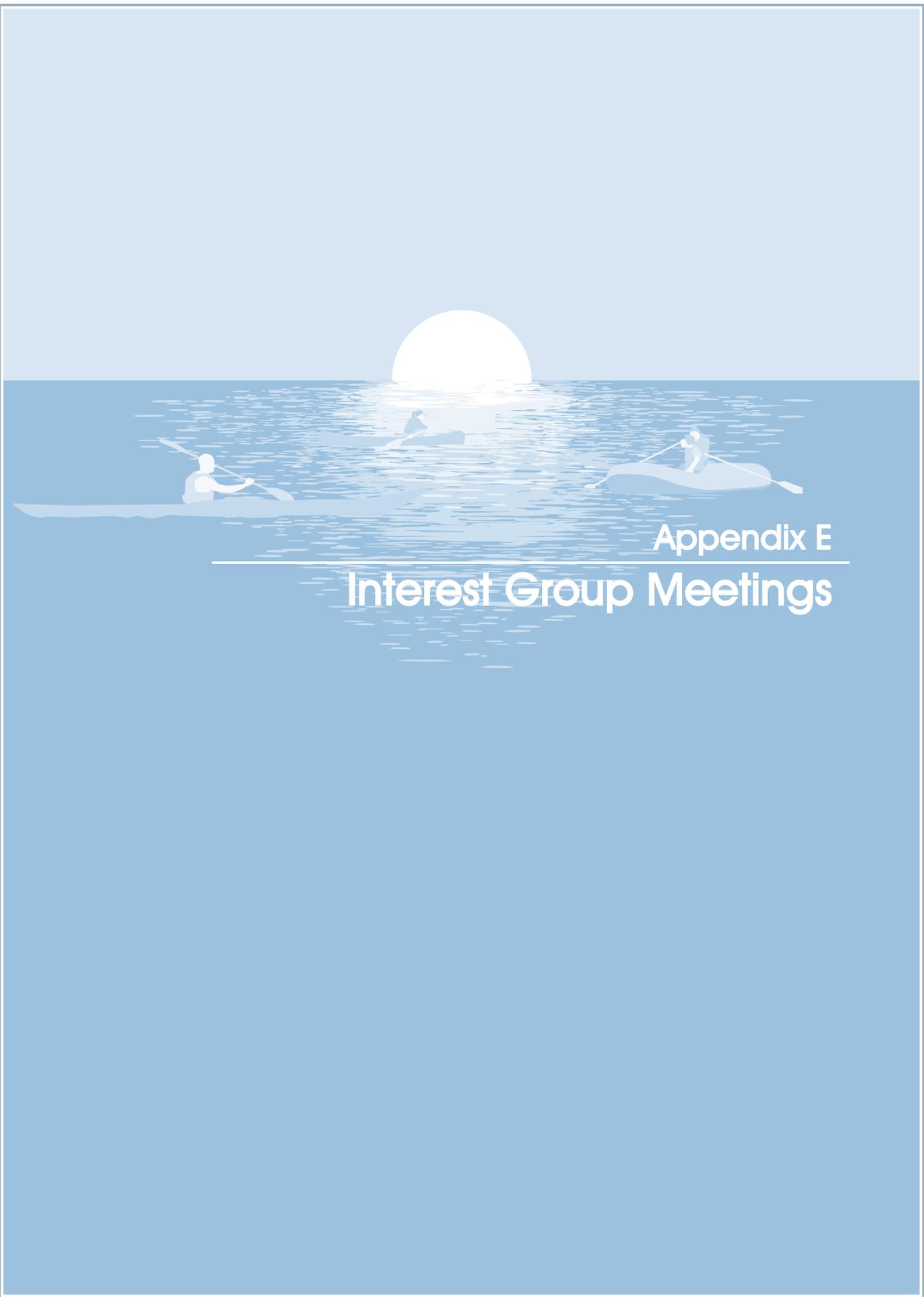
**Exhibit D.6**

**Commercial Whitewater Rafting Participation Numbers\* on Eleven California Rivers (1983 to 2006)**

Year	Sacramento Basin Region Rivers			Central Valley Region Rivers						North Coast Region Rivers	
	South Fork American	Middle Fork American	North Fork American	Lower Kern River	Upper Kern River	Forks of the Kern River	Tuolumne River	Kaweah River	Kings River	Klamath River	Cal-Salmon River
1. 1983	–	–	–	12,470	6,373	696	2,000	–	–	7,904	2,075
2. 1984	–	–	–	11,966	3,135	479	3,837	–	–	9,037	2,117
3. 1985	–	–	–	14,795	3,557	782	3,902	–	–	11,697	1,954
4. 1986	–	–	–	17,254	5,767	935	3,819	–	–	8,375	1,836
5. 1987	–	–	–	13,131	2,881	890	–	–	–	7,100	2,048
6. 1988	–	–	–	10,748	2,911	596	1,815	–	–	7,969	1,536
7. 1989	–	–	–	10,247	4,747	1,016	2,863	–	–	8,718	1,214
8. 1990	–	–	–	7,923	3,976	641	3,181	–	–	8,454	1,238
9. 1991	–	6,003	749	5,745	3,438	494	2,172	–	–	8,297	979
10. 1992	78,800	9,975	123	8,998	3,584	564	3,019	–	–	9,484	711
11. 1993	91,500	11,997	3,096	14,248	8,039	977	4,331	–	–	9,444	2,079
12. 1994	73,000	11,589	–	9,671	3,574	601	3,935	–	–	8,491	1,801
13. 1995	105,000	11,374	3,302	18,298	13,648	816	2,954	–	–	12,203	4,474
14. 1996	94,450	15,394	2,362	15,966	8,368	761	3,236	–	–	10,280	2,542
15. 1997	90,750	16,337	1,130	16,509	7,602	588	3,986	3,052	–	10,529	2,542
16. 1998	76,900	10,008	2,890	15,289	9,893	434	2,831	4,375	–	11,298	2,885
17. 1999	80,900	14,288	1,732	12,597	4,798	483	3,198	1,730	–	11,885	2,224
18. 2000	89,100	16,520	1,351	13,687	5,618	509	4,700	2,122	12,167	12,399	2,338
19. 2001	45,750	19,416	930	13,523	5,048	461	1,840	1,986	9,886	14,646	1,191
20. 2002	60,100	13,757	1,505	9,840	4,003	275	3,149	1,981	9,417	14,114	1,692
21. 2003	59,450	14,174	1,287	13,789	5,926	506	2,779	1,630	8,191	13,688	2,018
22. 2004	65,343	16,486	660	13,495	4,247	313	2,795	1,064	7,139	14,494	1,358
23. 2005	71,593	11,901	1,980	18,205	8,281	491	2,625	3,182	11,127	13,576	1,734
24. 2006	71,000	–	1,132	–	–	–	3,538	2,451	–	–	–

\* Participation data were not available for all years and rivers.

Source: River use data provided by Klamath National Forest Commercial Whitewater Use (Klamath, Scott, and Salmon Rivers); Sequoia National Forest (Kern Rivers); California State Parks, Auburn Office (Middle and North Fork of the American River); El Dorado County (South Fork of the American River); Stanislaus National Forest (Tuolumne River); Tulare County Kaweah River Management Plan (Kaweah River); and Terry Schumaker, Sierra National Forest (Kings River).



Appendix E

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# Interest Group Meetings

## E. Interest Group Meetings

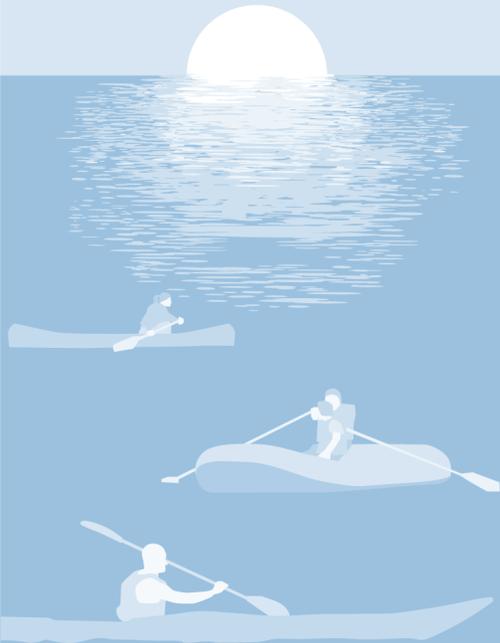
To obtain additional input from non-motorized boaters throughout the State, NewPoint Group held thirteen (13) interest group meetings during May, June, and July 2007. This appendix includes a description and list of the interest group meetings and the following:

- A sample announcement and flier (**Exhibit E.1** and **Exhibit E.2**)
- A sample PowerPoint presentation for the Save the American River Association, which focused on waterways in the Sacramento Basin, particularly the American River (**Exhibit E.3**).

NewPoint Group held many of the meetings as part of a boating club's existing monthly meeting, or a special meeting event. We held three meetings with a Board of Directors or Advisory Board. Finally, we conducted two meetings in a community and advertised to the general public. We selected the meetings in order to meet with a large number of experienced non-motorized boaters, for several different types of non-motorized boats, and in most of the State's ten regions.

NewPoint Group prepared an overview PowerPoint presentation for the meetings, and then customized each presentation to present results on waterways used and facility needs identified in the active-user survey for each region or type of non-motorized boat. Following the presentation, we asked attendees to identify waterways and specific facility needs or issues in the region. The responses of attendees are incorporated into Section 3: Waterways and Facility Needs for Non-Motorized Boating.

**Table E.1**, on the next page, identifies the thirteen meetings, locations, boat types, and number of attendees.



## E. Interest Group Meetings

**Table E.1**  
**Non-Motorized Boating Interest Group Meetings in California (2007)**

Region	Location	Organization	Boat Type(s)	Number of Attendees
1. North Coast	Eureka	Explore North Coast	Sea kayaks, surf kayaks, recreational kayaks	16
2. North Coast	Santa Rosa	Sequoia Paddlers	Canoes, kayaks, rafts	15
3. San Francisco Bay Area	San Francisco	Bay Area Sea Kayakers	Sea kayaks	75
4. San Francisco Bay Area	San Francisco	San Francisco Boardsailing Association (Board of Directors)	Sailboards, kiteboards	9
5. Central Coast	Avila Beach	Pale Kai Outrigger Club	Outrigger canoes	22
6. South Coast	Long Beach	California Kayak Friends	Kayaks, rafts, canoes	50
7. Northern Interior	Dunsmuir	Upper Sacramento River Exchange (general public)	Any	1
8. Sacramento Basin	Tahoe City	Lake Tahoe Water Trail Advisory Committee	Any	7
9. Sacramento Basin	Sacramento	Save the American River Association (Board of Directors)	Any (general waterway focus)	15
10. Sacramento Basin	Redding	Penguin Paddlers	Canoes, kayaks, rafts	35
11. Sacramento Basin	Sacramento	Whitewater kayakers (informal group)	Whitewater kayaks	4
12. Eastern Sierra	Mammoth Lakes	Mammoth Lakes Tourism and Recreation Department (general public)	Any	9
13. Southern Interior	San Jacinto	Valley Wide Kayak Club	Kayaks	35
<b>Total</b>				<b>293</b>

**Exhibit E.1**  
**Interest Group Meeting Sample Announcement (2007)**

**Non-Motorized Boating in California**  
**California Department of Boating and Waterways**  
**Interest Group Input Meeting**

**Thursday June 21, 2007**  
**6 pm**  
**Community Center**

All interested non-motorized boaters (including canoeists, kayakers, rafters, and more) are invited to attend an interest group meeting to provide input to the California Department of Boating and Waterway's study of non-motorized boating in California. The purpose of the meeting is to present preliminary study results on non-motorized boating in California, and to obtain input from area boaters on non-motorized boating facility needs, access concerns, and other issues.

The California Department of Boating and Waterways (Cal Boating) is conducting its first ever study of non-motorized boating in California. Cal Boating is a State agency whose mission is to provide safe and convenient access to California's public waterways, and leadership in promoting the public's right to safe, enjoyable, and environmentally sound recreational boating. A major focus for Cal Boating is to provide grants and loans for boating facilities such as launch ramps and marinas. While Cal Boating has supported several non-motorized boating initiatives over the last few years, Cal Boating-funded facilities are typically directed toward motorized boating.

As non-motorized boating activities have become increasingly popular in California and elsewhere, Cal Boating is considering providing more support to this growing boating community. As a first step in further planning and potential support for non-motorized boating, Cal Boating seeks to understand how many non-motorized boaters there are in California, the boats they own, and where and why they boat.

The results of this study will be used to help the Department to (1) understand how many, and what types, of non-motorized boats there are in California, (2) understand how economically important non-motorized boating is to California, and (3) prioritize, justify, and plan future facilities to meet the needs of non-motorized boaters.

Relatively little is known either nationally, or within California, about non-motorized boats and boating, and we have been working to obtain non-motorized boaters' input. As part of the overall non-motorized boating study, we have conducted three surveys: (1) an "active-user" Internet survey of 1,500 non-motorized boaters; (2) a statewide random telephone survey of about 450 households that own non-motorized boats; and (3) a survey of over 100 commercial and institutional organizations that rent, provide instruction, or conduct guided trips. This input is important because those who boat regularly will have a better awareness of facility needs, and will have the best perspectives on how to improve non-motorized boating in California.

In addition to these surveys, we are providing non-motorized boaters throughout the State the opportunity to provide in-person suggestions and comments related to non-motorized boating issues. This meeting is one of about twelve meetings being held statewide with various boating groups.

The input that we obtain at these meetings will be incorporated into our study findings. The final results of this study will be available late this year at the Cal Boating web page, [www.dbw.ca.gov](http://www.dbw.ca.gov). For additional information, please contact Wendy Pratt, of NewPoint Group, at 916-442-9227, or [wendypratt@newpointgroup.com](mailto:wendypratt@newpointgroup.com).

Exhibit E.2  
Interest Group Meeting Sample Flier (2007)



## Attention: Kayakers, Rafters, Canoeists (and others)

Provide your input on facilities and access issues to the first-ever study of Non-Motorized Boating in California conducted by the Department of Boating and Waterways.

### Interest Group Input Meeting

Thursday June 14, 2007  
7:00 – 8:30pm

At the River Center,  
5819 Sacramento Ave, Dunsmuir

Hosted by the Upper Sacramento River Exchange

Questions? Please contact Wendy Pratt of NewPoint Group  
(916) 442-9227 or [wendypratt@newpointgroup.com](mailto:wendypratt@newpointgroup.com)



## Non-Motorized Boating in California

Interest Group Input

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Sacramento Basin Region

May/June 2007



## Introduction

- Wendy Pratt, NewPoint Group  
(916) 442-9227  
[wendypratt@newpointgroup.com](mailto:wendypratt@newpointgroup.com)
- Contractors to California Department of Boating and Waterways (Cal Boating)  
[www.dbw.ca.gov](http://www.dbw.ca.gov)
- Mission of DBW is to provide safe and convenient access to California public waterways, and leadership in promoting the public's right to safe, enjoyable, environmentally sound recreational boating



## Purpose and Scope of Cal Boating Study

- Year long study of non-motorized boating in California
  - Canoes, kayaks, inflatables, rowing boats, sailboards, kiteboards, small sailboats, and others
- Examination of number of boats and boaters, boat types, facilities, health and safety issues, applicable laws, history, economic impact, and recreational user-value
- Provide Cal Boating with a planning tool to help (1) justify, (2) identify, and (3) prioritize facility projects that could support non-motorized boating. Funding of these non-motorized boating facilities is outside the scope of this first-level planning exercise



### Research Components

- Statewide and regional statistically significant random telephone survey of non-motorized boat owners
- Active-User Internet survey on Cal Boating web site
- Telephone and email survey of commercial and institutional entities involved in non-motorized boating
- Interviews with waterway managers of major California whitewater rivers
- Interviews with non-motorized boating experts
- Interest group meetings
- Extensive secondary literature and Internet research



### Final Report

- Non-Motorized Boating in California
  - Non-motorized boats and boaters
  - Waterways and facility needs
  - Annual economic impacts
  - Recreational user-value
  - History and laws
  - Safety issues
  - Health benefits
- Final report available on Cal Boating web page late this year, [www.dbw.ca.gov](http://www.dbw.ca.gov)



### Presentation Objectives

- Provide overview of results of Active-User Internet survey
- Hear your recommendations for improvements, additions, and/or potential new non-motorized boating facilities



## Presentation Outline

- Project Background
- Active-User Internet Survey Preliminary Results
- Questions and Comments
  - Focus on Sacramento Basin Region



## Ten State Regions

Coastal	Inland
1. North Coast	6. Northern Interior
2. San Francisco Bay Area	7. Sacramento Basin
3. Central Coast	8. Central Valley
4. South Coast	9. Eastern Sierra
5. San Diego	10. Southern Interior



## Ten State Regions (continued)





### Sacramento Basin Region



Trinity	Colusa
Shasta	Sutter
Tehema	Yuba
Plumas	Nevada
Glenn	Placer
Butte	Yolo
Sierra	Sacramento
Lake	El Dorado



### Active-User Internet Survey

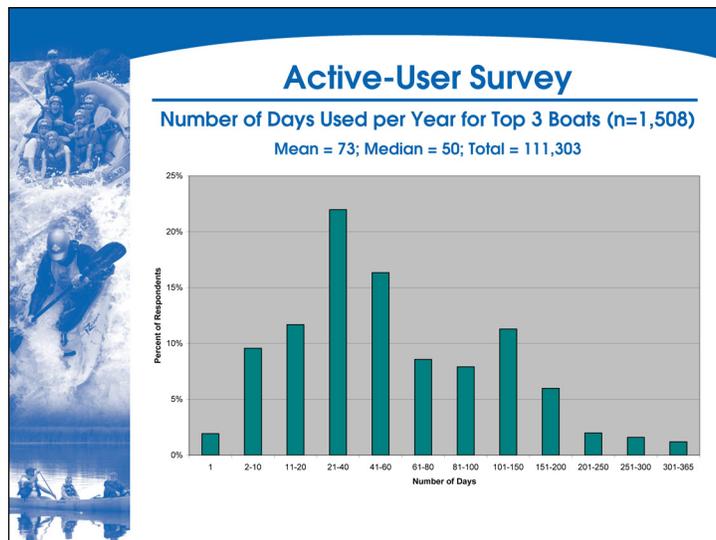
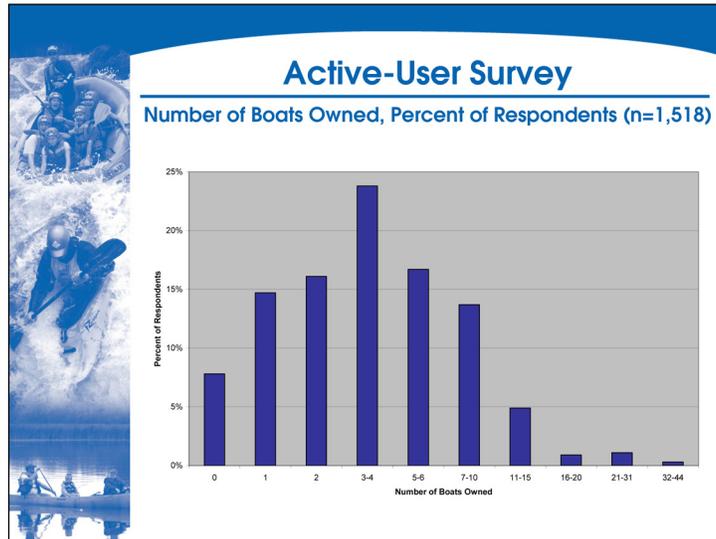
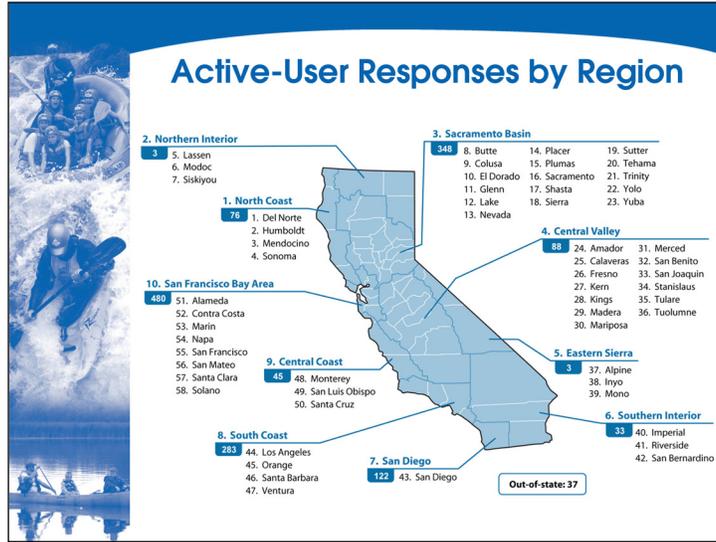
- Survey on Cal Boating web page for 2 months (mid-Dec 2006 to mid-Feb 2007)
- 1,518 respondents, with 6,799 non-motorized boats
  - 1,481 respondents from California
  - 37 from out-of-state
  - 1,400 own one or more non-motorized boats
  - 118 rent or use club boats only
- Non-random survey – results **cannot** be extrapolated to State overall

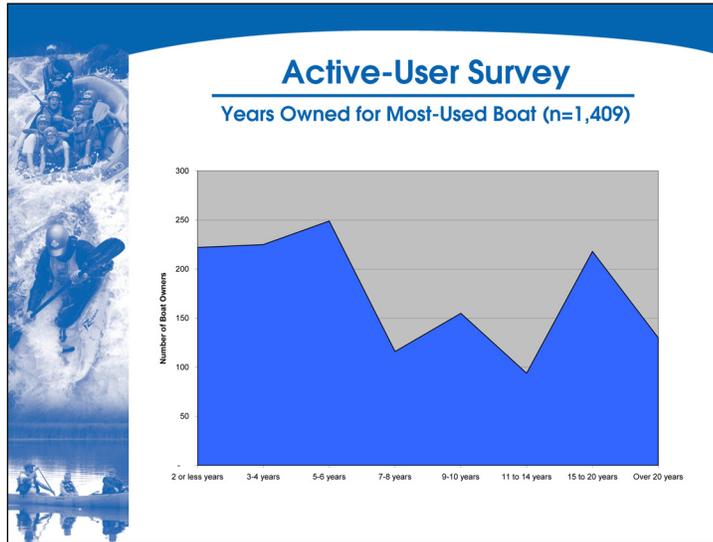


### Active-User Survey Types of Non-Motorized Boats

Sea/touring kayak (19%)	Kiteboard	Cataraft
Whitewater kayak (18%)	Fishing kayak	Row boat
Rowing shell or scull	Canoe	Inflatable other
Sailboard	Inflatable kayak	Small sailboat
Inflatable raft (7%)	Kayak (unspecified)	Pontoon boat
Outrigger canoe	Surfski	Fishing canoe
Recreational kayak (5%)	Other kayaks	Paddleboard
Dragon boat	Whitewater canoe	Poke boat

Other kayaks include: flatwater, racing, surf, sprint, folding, polo, sailing kayaks





**Active-User Survey**  
Why do you boat? (n=1,518)

Reason	Number of Responses	Percent of Respondents
Recreation	1,382	91%
To enjoy nature	1,240	82%
Fitness	1,233	81%
Challenge	1,228	81%
Leisure and relaxation	1,154	76%
Social activity	1,098	72%
Family activity	565	37%
Competition	504	33%
To access another activity	251	17%
Other reason	151	9%
<b>Total</b>	<b>8,796</b>	

- 
- Why boat at a particular waterway?**
- Close/convenient
  - Water conditions
  - Facilities
  - Not crowded
  - Features or destinations



### Facility Needs/Issues

- Lack of access
- Inadequate parking
- Water conditions
- Reckless boaters
- Overcrowding



### Safety Issues

- Interactions with motor boats
- Inexperienced boaters
- Poor water quality
- Crowding
- Unsafe water conditions



### Sacramento Basin Respondents

- N=348
- Boats per respondent
  - Average of 5.4, median of 4 boats
- Years owned
  - Average of 10.3, median of 9 years
- Days used top 3 boats
  - Average of 57, median of 40 days



### Sacramento Basin Responses

Active-User Survey (n=348)

Boat Used Most Often	Number of Responses	Most Used Waterway (top 8)	Number of Responses
Whitewater kayak	116	South Fork American	85
Sea/touring kayak	53	American River	53
Inflatable raft	50	Lake Natoma	29
Rowing shell or scull	30	Sacramento Deep Water Channel	25
Recreational kayak	21	Rivers	22
Inflatable kayak	20	Lakes	19
Canoe	12	Folsom Lake	9
Whitewater canoe	9	Sacramento River	8
Kayak (unspecified)	6		
Sailboard	5		
Cataraft	4		
Flatwater kayak	4		
Row boat	4		
Surfski	4		
Kiteboard	3		
Racing kayak	3		
Others	4		



### Facility Needs at SB Waterways

- 273 respondents identified facility needs (78%)
- South Fork American River
  - Maintain water level
  - Improved access
  - Whitewater park
  - Parking – including vehicle security
  - Restrooms
- American River
  - Maintain water level
  - Improved access
  - Whitewater park
  - Parking – including vehicle security



### Facility Needs at SB Waterways

(continued)

- Port of Sacramento/Deep Water Channel
  - Restrooms
  - Showers
  - Motor-boat free zones
  - Docks
- North Fork American River
  - Improved access
  - Maintain water level
  - Parking
  - Restrooms



### Facility Needs at SB Waterways

(continued)

- Lake Natoma
  - Restrooms
  - Motor-boat free zones
  - Parking
- North Fork Feather River/Feather River
  - Improved access
  - Maintain water level
  - Parking
  - Restrooms
- Sacramento River
  - Restrooms
  - Improved access
  - Parking



### SB Problem (Avoided) Waterways

- Folsom Lake
  - Reckless boaters
  - Overcrowding
- Lower American River
  - Overcrowding
  - Water conditions
  - Safety, reckless boaters, alcohol
- Feather River/North Fork
  - Inconsistent flows or releases
  - Lack of access
  - Inadequate parking



### SB Problem (Avoided) Waterways

(continued)

- Consumnes River
  - Lack of access
  - Inadequate parking
- Sacramento River
  - Reckless boaters
  - Lack of access
- South Fork American River
  - Overcrowding
  - Reckless boaters
- North Fork American River
  - Inadequate parking
  - Lack of restrooms



### SB Problem (Avoided) Waterways

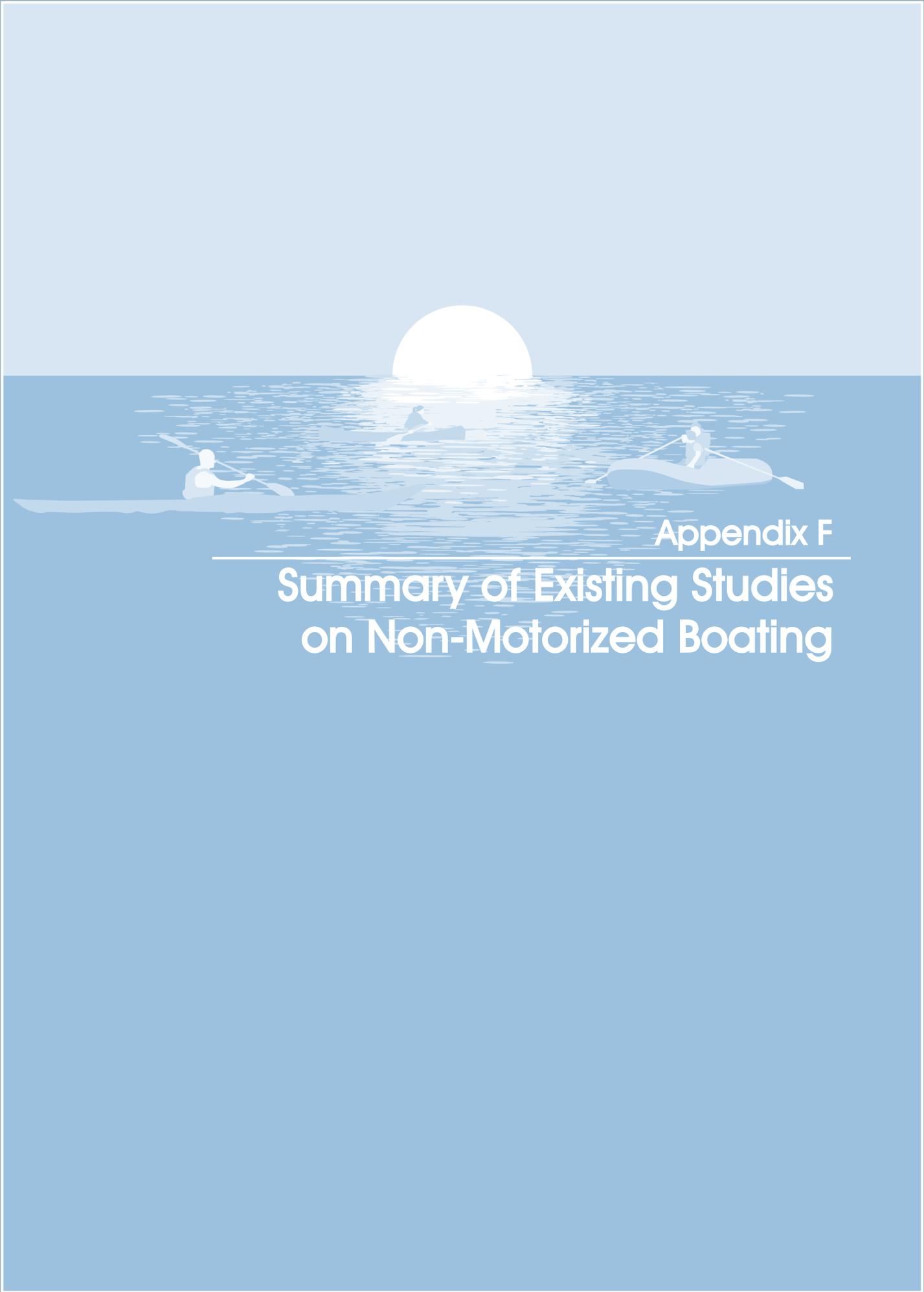
(continued)

- Middle Fork American River
  - Inconsistent flows or releases
  - Access roads in bad condition
- Tuolumne River (CV)
  - Access roads in bad condition
  - Inconsistent flows or releases
  - Poor condition of put-in
- Cache Creek
  - Poor water quality
  - Reckless boaters
- South Fork Yuba River
  - Inconsistent flows or releases
  - Inadequate parking
  - Water conditions



### Questions & Comments

- Questions
- General Comments
- Waterway-Specific Comments
- Additional comments, thoughts, and suggestions by email or telephone to:
  - Wendy Pratt at (916) 442-9227 or [wendypratt@newpointgroup.com](mailto:wendypratt@newpointgroup.com)



Appendix F

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# Summary of Existing Studies on Non-Motorized Boating



## F. Summary of Existing Studies on Non-Motorized Boating

This appendix summarizes existing literature on non-motorized boating participation. There have been a number of survey efforts directed at some aspects of non-motorized boating. None of these studies have addressed the full spectrum of non-motorized boats, and most have been national in scope, although some studies provided results by state or region. Most prior studies have identified participation in non-motorized boating activities, defined as participating in an activity at least once during the year in question. Participation is not the same as boat ownership, and includes those that own non-motorized boats, as well as those that rented, attended a class, or went on a guided trip. In general, participation data should be higher than ownership data because of these other avenues to participate in non-motorized boating.

In this section of the appendix we summarize seven (7) studies of non-motorized boating participation or sales.<sup>a</sup> First, we briefly describe the methodology and approach utilized for each study. Second, for each of the non-motorized boating categories that are described in the data, we provide a brief comparison of the results of those studies.

This appendix is organized as follows:

- A. Non-Motorized Boating Existing Studies*
- B. Non-Motorized Boating Existing Studies Participation Results*
- C. Non-Motorized Boating Existing Studies General Demographic Characteristics*

### A. Non-Motorized Boating Existing Studies

It is important to understand the limitations of prior survey data studies. For many of the participation studies, we cannot actually determine that participation was for non-motorized boating. This was particularly true of the “canoe” and “rafting/inflatables” categories, which, although often non-motorized, may in some instances be used with a motor. In some cases, such as the NSRE’s “rafting/floating” category, the study might have included some activities that would not be defined as non-motorized boating in our current study definition (such as floating in an inner tube). However, these studies also likely excluded some non-motorized boating activities that would be defined as non-motorized boating in our current study definition (such as using an inflatable boat for a tender, for scuba diving, or for fishing). Some data, such as the Outdoor Industry Foundation studies, are defined specifically as “human-powered”, in which case they should not include any motorized use.

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<sup>a</sup> References for these studies are provided one time, when the study is introduced. The later discussions identify the data sources, but they are not referenced. Please refer to the initial endnote for the exact reference document information.

Several studies provided statistics for participation in sailing; however, most did not distinguish the size of boat, and even the *State of the Industry* study of sailing only specified sailboat production at the 11 foot, or shorter, length. While we still summarize these sailing data, it is important to note that participation rates for sailboats 11 feet, or shorter, are likely much higher than for sailing with boats 8 feet in length, or shorter.

All of these studies of non-motorized boating participation faced the same statistical issues as the current study. Because only a small fraction of the population participates in non-motorized boating, the estimated participation rates were subject to high relative margins of error, even when the sample size was large. When error rates were provided, none of these studies specified whether error rates (margins of error) were absolute or relative; however based on sample sizes, they appear to be absolute margins of error.

Finally, none of these studies are directly comparable to this study of non-motorized boating in California. However, we summarize them in this Appendix because they represent the majority of national research on this topic.

### 1. National Survey on Recreation and the Environment (NSRE)<sup>1</sup>

The NSRE was conducted by the United States Forest Service (USFS), in cooperation with several other agencies and two universities. This was a large-scale national survey that has been conducted eight times, with the first survey conducted in 1960, and the most recent survey conducted from September 1999 through 2003. The survey examined a wide range of outdoor activities taking place on both public and private lands. While the methodology of the survey has changed somewhat over the years, and activities have been added over time, the basic survey approach has remained fairly stable.

The NSRE was a national telephone survey of the general public (age 16 and over) to determine participation in 80 different outdoor recreation activities. The most recent published data set (1999 to 2003) included interviews with more than 85,000 individuals. The NSRE data reflected an extraordinarily large number of surveys, and thus a high level of statistical confidence in its results.

The NSRE survey was conducted in batches, or versions, of approximately 5,000 completed surveys. Each version included the core set of participation and demographic questions, as well as a set of specific topic questions unique to that version. Between 1999 and 2001, the USFS completed nine versions, for a total of 42,868 interviews. By December 2003, the NSRE had completed fifteen versions, resulting in over 230,000 hours of interviewing and over 85,000 completed surveys.

NSRE data across versions were aggregated and tabulated nationally, and by USFS region, for males and females, three age groups, and five ethnicity categories. Confidence intervals for the data varied depending on the particular strata of information. However, combined (national) data were generally accurate within 2 to 3 percent, with a 95 percent confidence interval. The data were weighted to (1) correct for overrepresentation or underrepresentation of any particular demographic group; and (2) adjust for avidity, listing bias, and refusals.

The most recent published NSRE results included six non-motorized boating categories: rafting, sailing (all sailing), kayaking, canoeing, rowing, and sailboarding. Earlier versions of the NSRE included only some of these categories. For example, sailboarding has only been included since 1994 (two survey rounds), and in the first survey, canoeing and kayaking were combined into one category.

**Table F.1**, on the next page, provides national NSRE participation rates for six non-motorized boating activities. The most recent published national-level data were from 57,868 telephone

**Table F.1**  
**NSRE Participation Data for Six Non-Motorized Boating Activities**

Non-Motorized Boat Type	NSRE National Data • 1999-2003 Percent of Population Participating	NSRE Region 5 Data • 2000-2004 Percent of Population Participating
1. Rafting/Floating	9.7%	7.8%
2. Canoeing	9.6%	5.5%
3. Kayaking	3.7%	6.0%
4. Sailing (all sailboats)	5.2%	7.3%
5. Rowing	4.3%	3.6%
6. Sailboarding	0.8%	1.1%

surveys conducted between July 1999, and July 2002. The Region 5 data were drawn from a data set of over 81,000 national surveys (2000 through 2004). Region 5 consisted of only California and Hawaii, and thus essentially reflected California’s population characteristics (97 percent of Region 5 population is in California). The rafting/floating category had the highest participation rates of the six non-motorized boating activities at the national level, and within Region 5.

## 2. Outdoor Industry Foundation (OIF)<sup>2</sup>

The Outdoor Industry Foundation (OIF) is a non-profit research arm of an industry trade group, the Outdoor Industry Association. The OIF conducts an annual survey of participation in “human powered outdoor activities”. The OIF began tracking ten activities in 1998, but have added additional activities, and now annually track 22 activities. The initial surveys included canoeing and rafting, Kayaking, including a breakdown for recreation/sit-on-top, touring/sea, and whitewater, was added in 2001.

The survey was part of an ongoing study of Americans’ leisure time, Leisure TRAK<sup>®</sup>. This was a telephone survey, with “scientific sampling” and random digit dialing. The sampling used a disproportionate stratified random sample by census region and gender to ensure accurate representation

of subgroups. Interviews were conducted with one member of the household age 16, or over. A total of 4,000 interviews were conducted each year, with 1,000 surveys conducted during 14 day periods in March, June, September, and December.

Overall participation rates were accurate at the 95 percent confidence level within 1.6 percent. Any data at the subgroup level has a lower level of statistical accuracy, due to the smaller representation. For the 2005 study, participation rates were extrapolated to the U.S. population based on U.S. Census Bureau year-over-year estimates for individuals 16 and over, but excluding those in institutions, college dormitories, and other group quarters.

Results were provided by region, as well as nationally. California is part of the West region, which also includes Washington, Oregon, Idaho, Montana, Wyoming, Colorado, New Mexico, Utah, Nevada, Arizona, Alaska, and Hawaii. In 2001, the OIA provided state-by-state participation data.

The most recent OIF data, summarized in **Table F.2**, on the next page, was for 2005 participation rates. OIF provided some data at the regional level. At the national level, OIF data showed that rafting had the third highest participation, behind canoeing and kayaking. However, in the West, rafting and kayaking had equally high participation rates, with both greater than the canoeing participation rate.

**Table F.2**  
**OIF Participation Data for Three Non-Motorized Boating Activities**

Non-Motorized Boat Type	OIF National Data • 2005 Percent of Population Participating	OIF West Data • 2005 Percent of Population Participating
1. Rafting	4.7%	6.0%
2. Canoeing	9.3%	5.0%
3. Kayaking (all)	5.6%	6.0%
4. Kayaking (recreational)	4.0%	3.0%
5. Kayaking (sea/touring)	2.5%	3.0%
6. Kayaking (whitewater)	1.0%	NA

### 3. The Recreation Roundtable Survey<sup>3</sup>

The Recreation Roundtable was sponsored by the American Recreation Coalition, a non-profit organization that promotes partnerships in outdoor recreation. RoperASW has conducted a survey of attitudes and participation in outdoor recreation for the Recreation Roundtable, starting in 1994. The most recent survey, conducted in 2003, consisted of in-person interviews with 2,001 individuals, 18 and older. The survey tracked three non-motorized boating activities: canoeing/ kayaking, rowing, and sailing (again, all sailing combined). The survey did not provide any demographic breakdowns; however, the data showed historical trends for these three activities.

### 4. The National Recreational Boating Survey (NRBS)<sup>4</sup>

The NRBS was conducted for the United States Coast Guard (USCG) by Strategic Research Group in 2002. A total of 25,547 mail and telephone surveys were obtained between September 2001 and September 2002. The sample was stratified to obtain 500 eligible boaters within each state, 250 registered boaters, and 250 non-registered boaters. Registered boaters were surveyed by mail, with a 49 percent response rate. Non-registered boaters were surveyed by telephone, using random digit dialing procedures to identify eligible households. The telephone survey

response rate was 61 percent. Sample data were weighted to reflect the population of each state. A total of 495 surveys were completed in California. Results were compiled nationally and by state.

The survey covered all types of boating activities, including motorized and non-motorized boats. Five categories of generally non-motorized boats were included in the study: canoes, kayaks, rowboats, inflatables, and sail-only sailboats (all sizes). This study did not provide participation rates; however it did examine characteristics of various types of boaters.

### 5. American Sports Data SUPERSTUDY<sup>®</sup> of Sports Participation<sup>5</sup>

American Sports Data, Inc. (ASD) is a sports research company that has conducted annual surveys of sports participation since 1987. ASD currently tracks 103 sports and activities. NewPoint Group purchased ASD data for this report. Each January, ASD conducts a mailed survey of 25,000 households from a consumer mail panel. One individual over the age of six was pre-selected to complete the survey in each household (with parental assistance, if necessary).

The survey consisted of a four-page booklet of questions about sports participation, attitudes, and demographics for the previous calendar year. A total of 14,076 usable questionnaires were returned for 2005. The ASD data summarized in this Appendix

**Table F.3**  
**ASD Participation Data for Five Non-Motorized Boating Activities**

Non-Motorized Boat Type	ASD National Data • 2005 Percent of Population Participating	ASD West Data • 2005 Percent of Population Participating
1. Rafting	1.7%	2.6%
2. Canoeing	4.4%	3.1%
3. Kayaking	2.6%	2.8%
4. Sailing (all sailboats)	1.8%	1.7%
5. Sailboarding	0.2%	0.2%

is for calendar year 2005. The sample was balanced to reflect the non-institutionalized population of six years of age, or more, within the 48 continental United States. Weighting was based on the most recent Census update for five categories: age within gender, race, geographic region, and household income.

Based on the 2005 survey response rate and population, each usable survey represented 18,835 individuals. Data were extrapolated to the population for the nearest 1,000 people, representing the estimated number of non-institutionalized persons over six years of age living in the continental United States in 2005. Sampling errors were dependent on the number of respondents in any particular category. For those activities with a large number of respondents, for example running, error rates at the 95 percent confidence level were relatively low (less than 5 percent). In part because of the lower age group, ASD participation rates were, in most cases, lower than those of the other studies.

ASD collected data for five non-motorized boating activities: canoeing, kayaking, rafting, sailing (all), and sailboarding. Detailed demographic data were available at the national level; however only overall participation rates were available at the State level.

**Table F.3**, above, provides ASD participation rates for five non-motorized boating activities in 2005 at the national level and for the West. ASD used the same western states in their definition of West as OIF. ASD national and West results showed rafting

behind canoeing and kayaking participation rates. However in the West, the participation rates were all essentially similar, in the three (3) percent range.

## 6. National Marine Manufacturers Association (NMMA)<sup>6</sup>

NMMA annually produces a *Boating Statistical Abstract*. The *Abstract* is a compendium of recreational boating statistics for motorized and non-motorized boats. NMMA obtains data from a number of other organizations, such as the U.S. Coast Guard, and also conducts surveys of individuals and the boating industry. Non-motorized boats that are included in the *Abstract* are canoes, kayaks, and inflatables. The *Abstract* also includes a sailing category (using data from the Sailing Industry Statistics, below), with the smallest size breakdown for 11 feet, and under, in length.

While the *Abstract* includes overall recreational boating participation data, the primary focus is sales, thus, data in the NMMA report are quite different from the first five reports summarized in this section. The sales data for the paddle sports market were based on NMMA surveys that covered 70 percent of the market.

## 7. Sailing Industry Statistics<sup>7</sup>

The Sailing Company annually compiles statistics for the sailing industry. The survey includes production data from 137 out of 153 identified

North American sailboat builders, a 90 percent response rate. Data is broken down for sailboats by size, with the smallest increment being 11 feet, and under. Of the approximately 16,000 sailboats built by survey respondents in 2005, 28 percent were 11 feet, and under, in length. This was the second largest size category, with boats 12 feet to 19 feet making up just over one-half of all sailboats produced.

\* \* \* \* \*

California has different non-motorized boating preferences than the nation overall. Compared to national figures, Californians are less likely to canoe, a little less likely to row, and will raft at about the same rate as the national average. Californians are more likely to participate in kayaking and sailing, and a little more likely to participate in sailboarding, than the rest of the country.

**Table F.4**, on the next page, provides the national participation rate ranges for six categories of non-motorized boating from existing studies. The overall non-motorized boating participation rate for Californians age 12, and older, from this study, 8.25 percent, is provided for comparison.

Table F.4 also provides the conservative estimates of boat type participation for regularly used boats from this study. These estimates are difficult to compare to the participation studies because they do not take into account that individuals may participate in more than one boat type. Thus, the current study results represent minimum participation rate figures for each boat type.

## B. Non-Motorized Boating Literature Existing Studies Participation Results

This subsection briefly summarizes primarily national participation rates, and sales data for six major types of non-motorized boating: (1) canoeing; (2) kayaking; (3) rafting, or floating/rafting, or inflatables; (4) rowing; (5) sailing; and (6) sailboarding/windsurfing.

## 1. Canoeing

Canoeing is the most traditional non-motorized boating activity, and has been tracked for the longest period of time. There were several sources of data on canoe participation and demographics, although some combined canoeing with kayaking, or other paddle sports. Canoe participation data was provided in NSRE, OIF, ASD, and the Recreation Roundtable. Canoe participation rates were generally higher than for other non-motorized boating activities.

While canoeing is the most popular non-motorized boat activity nationally, it is not as popular in California as the rest of the country. All data sources indicate that canoe participation is lower in California and/or the Western United States. Canoeing is most popular in the Midwest and Northeast.

The existing literature national participation rate ranges for canoeing were between 2.0 percent and 9.7 percent of the population. The average national canoeist participated between 4 and 8 days per year.

The NMMA tracks national canoe sales through a monthly survey of wholesalers (currently covering about 70 percent of the paddle sports market). Among the nine boat types monitored, including motorized and non-motorized boats, canoes were the fourth highest selling boats, following kayaks, outboard boats, and personal watercraft, and just slightly higher than sterndrive boats.

In 2005, there were 77,300 canoes sold in the United States, one of the lowest sales years on record, and significantly lower than 2004, when 93,900 canoes were sold. The highest canoe sales year on record was 1981, with sales of 126,000.

NMMA canoe sales in the first three quarters of 2006 were up 29 percent from the same time period in 2005, at 45,251 units.<sup>8</sup> We cannot determine California sales from these data. Canoe sales in a given year do not provide insight into canoe use, as there are a large number of canoes that are many years old, but still being used.

**Table F.4**  
**Non-Motorized Boating Participation Rates<sup>a</sup> from Existing Studies (Various years)**

Activity	Current Study Results Rate	Literature Low Rate	Literature High Rate
All Non-Motorized Boating	8.25%		
1. Rafting <sup>b</sup>	2.7%	1.7%	9.7%
2. Kayaking (all) <sup>c</sup>	2.6%	2.6%	6.0%
a. Recreational		3.5%	4.0%
b. Sea/Touring		2.5%	4.5%
c. Whitewater		1.0%	1.2%
3. Canoeing	0.7%	2.0%	9.7%
4. Rowing	0.4%	3.0%	4.3%
5. Sailing <sup>d</sup>	0.2%	0.1%	0.4%
6. Sailboarding	0.2%	0.2%	1.1%

<sup>a</sup> Percent of study populations for literature rates, most based on age 16 and older. Used percent of California 2006 population age 12, and over, for current NMB study (surveys did not identify age of household participants)

<sup>b</sup> Rafting in some literature studies also includes “floating”.

<sup>c</sup> Kayak subgroups do not add up to total, as some individuals participate in more than one kayak type.

<sup>d</sup> To extrapolate downwards from larger sailboats, adjusted literature results based on an assumption that 5 percent of sailing is in boats 8 feet, and under.

## 2. Kayaking

Kayaking has evolved from a technical sport for experts to one that also provides an easy-to-learn recreational activity for novice boaters. Data on national kayaking participation was not tracked until the 1990s, although the 1982/1983 NSRE survey combined canoeing and kayaking into one category. By the 1994/1995 NSRE survey, the two activities were separated. ASD began tracking kayak participation in 1998, and OIF began tracking kayaking, divided into three major categories, in 2001. Kayaking, unlike canoeing, appears to be more popular in California than the nation overall.

The existing literature national participation range for kayaking was between 2.6 percent and 6.0 percent of the population. The average kayaker participated in the activity between 6 and 13 days per year.

National kayak participation rates among the general public increased in 1999/2001, with a growth rate of 186 percent from the previous NSRE survey, the highest growth rate of all

activities measured. The national participation rate in 1999/2001 was 3.5 percent, or 7.4 million participants. Participation rates were higher in the West, with 5.3 percent participation in the Pacific Coast region, and 4.4 percent participation in California.

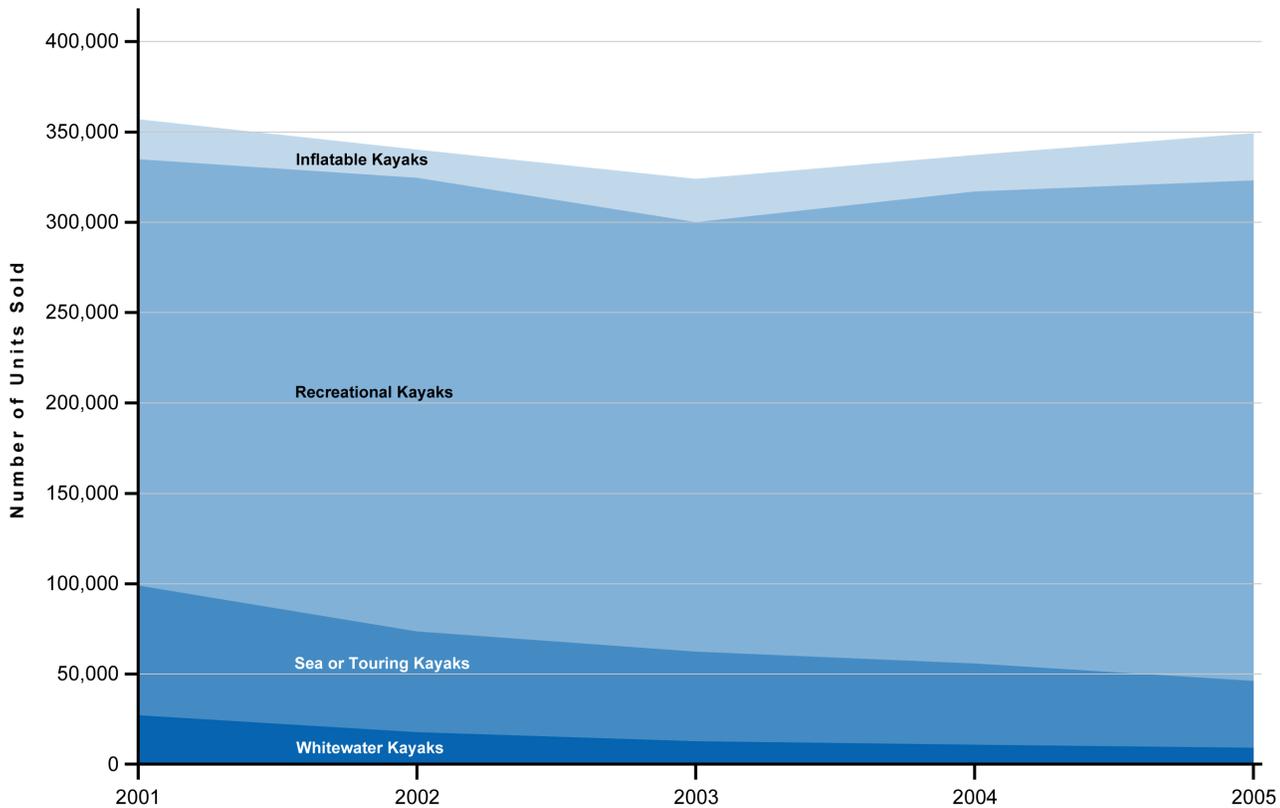
The Outdoor Industry Foundation was the only participation study to provide national kayaking data for different types of kayaking: recreation/sit-on-top, touring/sea, and whitewater.

OIF national participation rates in all types of kayaking increased from 2004 to 2005, to 5.6 percent of the population, or 12.6 million participants.

Of the three types of kayaking, recreational/sit-on-top was the most popular. This form of kayaking is more attractive to beginners, as the boats are easy to maneuver, and relatively inexpensive.

In 2005, OIF estimated that 4.0 percent of the national population participated in recreational kayaking, or 9.0 million people. Participation rates were somewhat lower in the Western United States, as compared to the rest of the country.

**Exhibit F.1**  
**NMMA National Kayak Sales, by Type, 2001 to 2005**



Source: NMMA, 2006. From Table 13.3, "Estimates of Kayak Retail Sales," p. 109.

Sea kayaking or touring was the second most popular kayaking activity. In 2005, OIF estimated that 2.5 percent of the national population participated in sea kayaking, a rate that had been stable since 2003.

Whitewater kayaking had the lowest national participation rates of the three kayaking activities in the OIF study, at 1.0 percent in 2005, or 2.2 million people. Whitewater kayak participation rates were highest in the South Central and West regions, both known for good whitewater rivers.

The NMMA did not begin tracking kayak sales until 2001, when kayaks were already the top selling boat in the survey, at 357,100 sold. This figure was well above the next highest

selling boat, outboard motor boats, at 217,800 boats sold. High sales of recreational kayaks have driven overall kayak sales, with over 277,000 sit-in and sit-on recreational kayaks sold in 2005, up from 236,000 sold in 2001.

**Exhibit F.1**, above, illustrates kayak sales, by type, between 2001 and 2005. While sales of the more technical specialty kayaks, such as whitewater and sea/touring kayaks have declined since 2001, recreational kayaks have seen consistent growth. Kayak sales continued to increase in 2006, with NMMA 3<sup>rd</sup> quarter 2006 kayak sales up 12.6 percent compared to the same time in 2005, at 263,679 units.<sup>9</sup>

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### 3. Rafting, or Floating/Rafting, or Inflatables

The rafting category in existing studies is less clearly defined than canoeing or kayaking, as there are many types of rafts or inflatable boats. The NSRE combined rafting and floating in one category. This category may include rafting in an inflatable boat with a motor, and it may also include floating in an inner tube (tubing), which is not classified as a non-motorized boat for this study. Thus, these studies may overstate some estimates of rafting, floating/rafting, or inflatables participation. Rafting participation rates were not measured until the 1994/1995 NSRE study. The OIF began measuring rafting participation (for them defined as “human-powered”) in 1998, as did ASD.

Rafting appears to be about as popular in California as the nation overall, although one study found rafting participation in California slightly above the national rates, and another found California participation slightly below national rates. Rafting participation rates in Western states are often higher, but are typically driven by higher participation in the Mountain States and Northwest, not California.

The national participation rate for rafting in existing studies was between 1.7 percent and 9.7 percent, one of the wider ranges.

The Outdoor Industry Foundation data reflected non-motorized rafting only. In 2005, OIF found a 4.7 percent national participation rate, or 10.6 million rafters nationally.

NMMA tracked inflatable sales in the 1980s and early 1990s, and then not again until 2003. Over the last three years, about 30,000 inflatable boats were sold each year in the United States. Inflatable sales were well below the high-selling canoes and kayaks, but still higher than inboard boats, sailboats, and jet boats. NMMA inflatable sales in the first three quarters of 2006 were down 16.6 percent compared to the same time period in 2005, at only 8,117 units.<sup>10</sup>

### 4. Rowing

Only NSRE, USCG, and the Recreation Roundtable provided data on rowing as a subcategory. There was no definition of rowing, so it likely included any type of rowing activity – rowing sculls and shells, row boats, tenders, dories, driftboats, and rowing boats that are sometimes used with a motor. Rowing participation rates in California appeared to be slightly lower than national rowing participation rates.

The national participation rate for rowing was between 3.0 percent and 4.3 percent, a relatively small range, which is perhaps a result of the limited data, rather than the accuracy of the data.

### 5. Sailing

There were no equivalent data for sailing, as defined by this study. Sailboat participation studies did not provide any breakdown by the size of sailboat, and most did not distinguish whether or not the sailboat had an auxiliary motor. Many studies examined sailing participation overall, including NSRE (dating back to 1960), ASD, USCG, and the Recreation Roundtable. We briefly summarize these studies below, and made an assumption that 5 percent of sailing participation was in sailboats 8 feet long, and under. This assumption was based on estimates of the total number of small sailboats provided by small sailboat organizations in California.

The participation rate for small sailboat sailing (based on our 5 percent assumption) was between 0.1 percent and 0.4 percent.

There are three primary sailboat brands that were within the scope of this non-motorized boating study, El Toros, Optimists, and Sabots. These small sailboats are 8 feet, or less, in length, and are popular for both teaching sailing, and racing.

There were an estimated 500 to 1,000 El Toro sailboats in California, with about 300 registered for racing.<sup>11</sup> There were an estimated 500 Optimist sailboats in California. Many of these boats have

been purchased by yacht clubs or learn-to-sail programs over the last five years.<sup>12</sup> There have been a total of 10,000 Sabots built in the United States over the last 50-plus years. Many of these boats were no longer active, and/or were not in California. There were likely at least 1,000 active Sabots in California, with about 900 registered for racing, and 500 actively racing.<sup>13</sup> There were likely a large number of old, unused, Sabots scattered throughout Southern California in garages and backyards. Many of these boats were made by the owner, so that even if sales data were available at the 8-foot-length-and-under level, it would not include the universe of homemade boats. Based on these estimates, there were about 2,500 small sailboats currently active in California.

NMMA provided data on sailboat sales for boats under 11 feet in length (in part through The Sailing Company) from 2000 through 2005. The highest recorded sales were for 2000, at 8,123 boats. Between 2003 and 2005, sales were approximately 4,000. Sales of boats 8 feet, and shorter, were likely a small subset of this amount. For example, based on sail numbers, there have only been 10,000 Naples Sabots made since the mid-1940s.<sup>14</sup>

### 6. Sailboarding/Windsurfing

Participation data for sailboarding (also called windsurfing) was provided in only two sources: NSRE and ASD. Sailboarding was more popular in the late 1980s and early 1990s, and participation appears to have fallen off since that time. Sailboarding participation rates in California appear to be slightly higher than national rates.

Sailboarding participation makes up a relatively small percentage of the population. The national participation rate range for sailboarding was between 0.2 percent and 1.1 percent.

NMMA tracked sailboard sales between 1980 and 1990, when sales were at 42,000 units. The highest year on record was 1987, at 70,000 units. Sales declined each of the following years that were measured.

### C. Non-Motorized Boating Existing Studies General Demographic Characteristics

Beginning with the NSRE in 1960, studies of outdoor recreation participation have identified characteristics of non-motorized boaters, and outdoor enthusiasts in general, that have remained consistent over time. Participation in outdoor recreation activities is positively correlated with income and education. The more education and/or income, the more likely an individual is to participate in these activities. The income correlation sometimes breaks down at the highest levels, with participation rates among the top income category lower than the next-to-top income category.

The demographic results of these other studies are consistent with this report. Over 82 percent of boat-owning respondents in the statewide random survey were Caucasian, compared to 43 percent of the State population.<sup>15</sup> Statewide random survey respondents were also more highly educated. Twice as many respondents had college degrees, and three times as many respondents had advanced degrees, compared to the State population. In the mid-income category of \$50,000 to \$100,000 per household, the percentage of respondents was about the same as the State population. However, there were fewer respondents in the lower income categories and more in the higher income categories, than the State population.

In the current study of non-motorized boating, and all existing studies, participation rates for all non-motorized boat types were highest for Caucasians. In some cases participation rates for Hispanics and/or Asians were increasing, but in all cases were much lower than expected based on population. Participation rates for African Americans were low. Participation among males was slightly higher than females for most activities, although typically there were not significant differences between genders.

**Table F.5**  
**Typical Demographic Characteristics by Non-Motorized Boat Types**

Boat Type	Gender	Age	Ethnicity	Household Income	Education	Experience
1. Canoes	Slightly more males	More in middle age groups, also younger	Primarily Caucasian, with increasing Hispanic	High	Mostly college graduates or full time students	Many less than 3 years or 10 or more years
2. Kayaks	More males	Younger, with some in older age groups	Primarily Caucasian, with increasing Hispanic and Asian for recreational kayaks	Higher	Mostly college graduates or advanced degrees	Many less than 3 years, a few 10 or more years
3. Rafts	About even	Younger, through 30s	Primarily Caucasian, some Hispanic	High	Mostly college graduates or some college	Many less than 3 years, or 10 or more years
4. Row boats	Slightly more females	Even among age groups (i.e. more older boaters)	Primarily Caucasian	High	Mostly college graduates or some college	Unknown
5. Sailboats	About even	More older	Primarily Caucasian	Higher	Mostly college graduates, advanced degrees, or full time students	Many less than 3 years, or 10 or more years
6. Sailboards	Even or more males	Younger, with some in older age groups	Primarily Caucasian	High	Mostly college graduates or some college	Many less than 1 year, or 10 or more years

**Table F.5**, above, provides a summary of typical demographic characteristics for each of the non-motorized boat categories, based on the results of NSRE, OIF, and ASD surveys. The typical, or stereotypical, non-motorized boater is generally young, white, college educated, with a relatively high household income. For the “enthusiast” category – the top tier of participants in terms of days of participation per year – these characteristics were even more heightened. Enthusiasts were even more often male, white, and highly educated with high incomes.

In general, participation rates decrease with age, after a point. For most non-motorized boating activities, the greatest participation rates were among those under 24 or 34 years of age. Participation in the 35 to 54 age category was

still reasonably high for most boat types, but tended to drop off beyond age 55. In the enthusiast category, NSRE found that between 1994/1995 and 1999/2001, the percentages of enthusiasts 50 years or older in almost all activities rose, perhaps indicating an increasingly active, but aging, population of Baby Boomers. This trend was particularly evident in kayaking.

In terms of experience, there was typically a split between relative newcomers to an activity, and those with ten or more years of experience. The data seem to indicate that a higher percentage of individuals try an activity and may participate for a few years, but fewer keep with it. For each activity there was a subset of individuals, often seasoned experts and enthusiasts, that have participated for ten-years or more.

Appendix F Endnotes

<sup>1</sup> For the 1960-1961 survey: Abbott L. Ferriss, et al., *National Recreation Survey* (Washington D.C.: prepared for the Outdoor Recreation Resources Review Commission, ORRC Study Report 19, 1962); For the 1982-1983 survey: National Park Service, *1982-1983 Nationwide Recreation Survey* (Washington D.C.: U.S. Department of Interior, National Park Service, April 1986); For the 1994-1995 survey: H. Ken Cordell, Jeff Teasley, and Greg Super, *Outdoor Recreation in the United States: Results from the National Survey on Recreation and the Environment* (Athens, Georgia: Prepared for the USDA Forest Service, August 1997), and H. Ken Cordell, et al., *Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends* (Athens, Georgia: Sagamore Publishing, 1999); for the 1999-2004 survey: H. Ken Cordell, et al., *Outdoor Recreation for 21<sup>st</sup> Century America* (State College, Pennsylvania: Venture Publishing, Inc., 2004), United States Forest Service, *Recreation and Tourism Statistics Update, Participation in Outdoor Activities by People Living in Region 5* (Athens, Georgia: Southern Research Station, USFS, April 2006), United States Forest Service, *1999-2000 National Survey on Recreation and the Environment* (Athens, Georgia: Southern Research Station, USFS, 2001), H. Ken Cordell, et al., "United States of America: Outdoor Recreation," Chapter 16 in *Free Time and Leisure Participation: International Perspectives* (CAB International, 2005), and Vernon R. (Bob) Leeworthy et al., *Projected Participation in Marine Recreation: 2005 and 2010* (Silver Spring, Maryland: National Oceanic and Atmospheric Administration and U.S. Forest Service, March 2005). With the exception of the published books, studies from the NSRE are available at: <http://www.srs.fs.usda.gov/trends/NSre?nsre2.html>.

<sup>2</sup> Leisure Trends Group, *Outdoor Recreation Participation Study, Seventh Edition, For Year 2004* (Boulder, Colorado, Outdoor Industry Foundation and Outdoor Industry Association, June 2005); and Leisure Trends Group, *Outdoor Recreation Participation Study, Eighth Edition, For Year 2005* (Boulder, Colorado, Outdoor Industry Foundation and Outdoor Industry Association, June 2006).

<sup>3</sup> Roper ASW, *Outdoor Recreation in America 2003: Recreation's Benefits to Society Challenged by Trends* (Washington D.C., prepared for The Recreation Roundtable, January 2004).

<sup>4</sup> Strategic Research Group, *2002 National Recreational Boating Survey State Data Report* (Columbus, Ohio: prepared for the United States Coast Guard, November 30, 2003); and Strategic Research Group, *2002 National Recreational Boating Survey Report* (Columbus, Ohio: prepared for the United States Coast Guard, November 30, 2003).

<sup>5</sup> American Sports Data, Inc., *The Superstudy<sup>®</sup> of Sports Participation Volume 3, Outdoor Activities 2005* (Cortland Manor, New York: American Sports Data, Inc., 2006); and American Sports Data, Inc., "California", "Ethnicity", and "Lifestyle Segments" reports (Cortland Manor, New York: American Sports Data, Inc., 2006).

<sup>6</sup> National Marine Manufacturers Association, *2005 Recreational Boating Statistical Abstract* (Chicago: NMMA, 2006).

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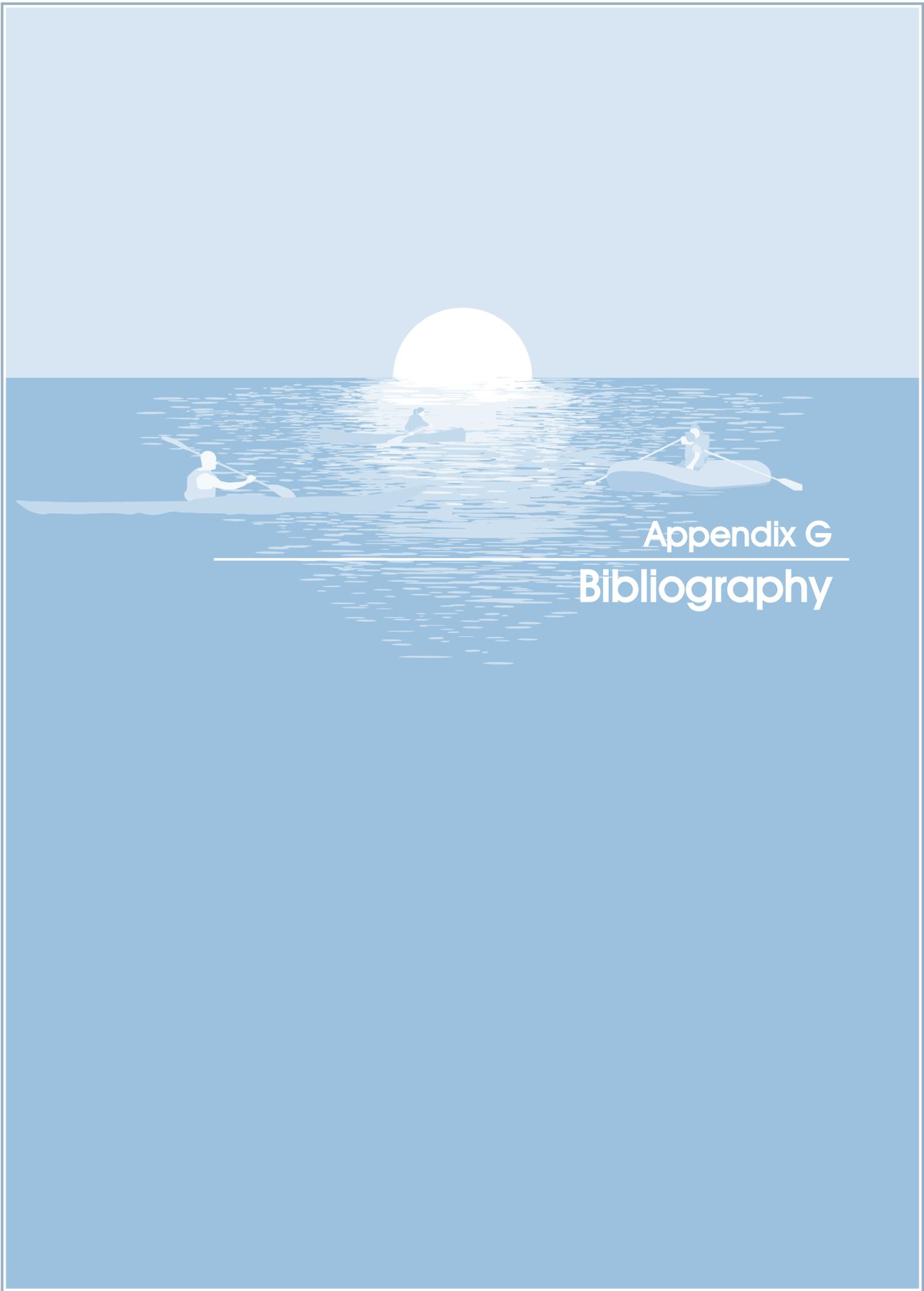
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