

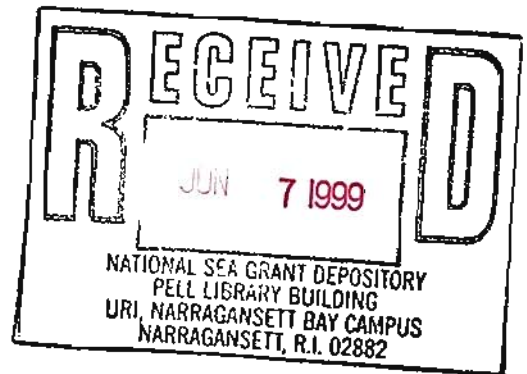
The Business of
**BOATING
RECREATION
IN OREGON**

Robert M. Neely
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Contents

List of Illustrations	iv
Executive Summary	1
Purpose of the Study	1
Methods Used in the Study	1
Results of the Study	2
Registered Recreational Boating	4
Methods Used	4
Results	4
Boating Expenditures by Respondents	4
Statewide 1995 Trip and Boat-Related Registered Recreational Boating Expenditures	5
Total Estimated Economic Impact of Registered Recreational Boating in Oregon	6
Commercial Motorized Recreation Boating	8
Excursion Outings	8
River Excursion Trips	8
Commercial Motorized Tour Boat Trips	9
Statewide Motorized Tour Boat Use	9
The Economic Impact of Motorized Tour Boats	9
Ocean Charter Fishing	10
Background	10
Estimating the Economic Impact and Trends of Ocean Charter Fishing in Oregon	11
Coastal Aquatic Nature-Based Tourism	13
Conclusion	13
Nonregistered Recreational Boating	15
The Economic Impact of Windsurfing in the Columbia Gorge	15
Background	15
Results	15
The Economic Impact and Trends of Nonregistered River Boating	16
Background	16
Results	17
Conclusion	20
The Marine Trades: Manufacturing, Sales, and Services	21
Background	21
Results	21
Conclusions and Implications for the Future	23
Registered Recreational Boating	23
Electronic Communications—Trends and Implications	24
Commercial Motorized Recreational Boating	24
Nonregistered Recreational Boating	24
The Marine Trades	25
References	26

Illustrations

Table 1. Estimated annual economic impacts of Oregon boating recreation activities	3
Table 2. Boating expenditures per trip	5
Table 3. Annual boat-related expenditures	5
Table 4. Total estimated economic impacts of Oregon registered recreational boating in 1995	7
Figure 1. Oregon motorized tour boating days	10
Figure 2. Charter angler trips by species	11
Table 5. Trip expenditures for ocean charter anglers in 1995 (\$)	12
Table 6. Total 1995 trip expenditures and personal income generated by Oregon ocean charter boat angling (\$)	13
Table 7. Estimated minimum 1995 trip expenditures for CMRB	14
Table 8. Average daily expenditures for windsurfers in the Columbia River Gorge in 1990	16
Table 9. Direct economic impact of windsurfing in the Gorge in 1990	16
Table 10. Nonregistered river boating user days in 1995	17
Figure 3. Nonregistered river boating use trends	18
Table 11. Adjusted 1995 expenditures for Clackamas boaters	18
Table 12. Estimated 1995 commercial guide fee	19
Table 13. Estimated 1995 economic impact of recreational floating for known user days	19
Table 14. Economic impact of recreational floating for 1995 estimated user days, based on Palazzi 1986	14
Table 15. Economic description of the Oregon marine trades in 1995	22

Executive Summary

The lakes, rivers, and coastal waters of Oregon have long provided residents and visitors with unique recreational boating opportunities. However, this popular activity represents more than a form of recreation: boating is an important component of the Oregon economy. Each year, boaters spend millions of dollars in association with boating activities, and this spending contributes to the state economy by generating revenue for businesses and providing income and employment for individuals. Furthermore, recreational boating activity in Oregon has continued to increase over a period of decades, suggesting that the associated economic impact has also grown.

Data collected by the Oregon State Marine Board (OSMB) indicate that, historically, the growth rate of boats registered in Oregon has consistently outpaced population growth rates. For instance, between 1982 and 1992, the number of days of boat use increased in Oregon by 67 percent. During this same interval, the state's population grew by about 12 percent and new boats registered with OSMB increased by 31 percent (OSMB 1996).

In 1995, in response to these growth trends, we conducted a study, funded by OSMB and Oregon Sea Grant, to assess the economic impact of boating recreation in Oregon. This publication provides a synopsis of the results of that study.

Purpose of the Study

Our objectives in this study were (1) to assess the scope of recreational boating in Oregon, (2) to estimate the contribution of boater expenditures to the state's economy, and (3) to estimate future trends in boating activities and associated economic impacts. Since policymakers must often weigh the economic implications of their decisions, we intended for the study results primarily to assist OSMB and others in making informed public policy and business decisions.

Methods Used in the Study

Boater expenditures generate economic impacts directly and indirectly to the marine trades (for example, new boats, boat repairs, equipment rental, and marinas), travel and tourism (lodging, restaurants, entertainment, and so on), and other economic sectors such as retail trade.

In this study, we combined boater expenditure information with an input-output model to estimate the total economic impact of components of registered recreational boating, commercial motorized recreational boating, and nonregistered recreational boating in Oregon. We derived use estimates and boater population estimates from primary sources, as well as from data from government agencies and the private sector. Therefore, the impacts we report are only as accurate as the primary and secondary sources from which they were derived.

Input-output is a tool used by many researchers for estimating economic linkages and impacts within a regional economy. Within the model, the economic relationships between economic players in the economy are represented. Input-output analysis may also be used to demonstrate how a change

in any given sector affects sales, income, and employment of all sectors of a regional economy.

For our study, we used the IMPLAN input-output modeling system to construct a model that represents the Oregon economy. IMPLAN (impact Analysis for planing) is a software package developed by the United States Department of Agriculture (USDA) Forest Service. The IMPLAN system can be used to construct an input-output model for any county or combination of counties in the U.S., based on a combination of national average production relationships and local employment information. Although IMPLAN was originally developed for forest management purposes, it has been used often for tourism, recreation, and natural resource-based analysis at the regional and state level.

It should be noted that results are subject to model limitations. These limitations imply that calculated economic impacts such as personal income generated and employment are not necessarily completely dependent on boating activity. In other words, if boater expenditures were to decline significantly in a given year, any associated loss of personal income and jobs might be mitigated by substitution spending, such as spending on other recreational activities that have similar expenditure patterns. For a more complete discussion of input-output modeling, please refer to the full version of this study (see footnote, page 26, for ordering information).

Results of the Study

Study results indicate that boating recreation has a significant impact on the economy of Oregon (table 1). As expected, travel, recreation, and tourism-related businesses such as retail trade, restaurants, lodging places, and water-based amusement and recreation services are the economic sectors most directly affected by boating expenditures. Although the greatest impacts are found in these sectors, the indirect and induced effects of boating recreation are significant throughout the state economy.

Direct effects are those that result in immediate impacts to businesses that sell goods and services directly to boaters. The impacts of a business' sale do not stop after the direct effects on the business and its employees. When the business purchases the other inputs needed to meet the requirements of the sale, there are *indirect effects* on other businesses. In addition, the extra wages paid to labor will lead to more purchases of consumer goods (for example, groceries and travel). The impact of these household purchases is called the *induced effect*.

In the following sections, we describe recreational boating components in Oregon and summarize their estimated economic impacts.

Table 1. Estimated annual economic impacts of Oregon boating recreation activities

Activity Type	Total Expenditures (\$)	Personal Income Generated (\$)	Employment (jobs)	Total User Days
RRB¹	858,518,544²	537,954,164	25,595	3,904,000
CMRB¹	16,919,714	3,398,046	NA	475,600
River cruises	5,500,000	NA	190 ⁴	275,000
Motorized tour boats	7,240,000	NA	NA	162,000
Charter boats	4,179,714	3,398,046	NA	38,600
Guided fishing	NA ³	NA	NA	NA
Coastal ecocruises	NA	NA	NA	NA
NRRB¹	131,451,524	70,563,452	3,302	1,770,429
Windsurfing	20,999,987	NA	NA	300,429
White-water/float ⁵	110,451,537	70,563,452	3,302	1,470,000
Total	1,006,889,782	611,915,662	28,897	6,150,029

¹RRB = registered recreational boating

CMRB = commercial motorized recreational boating

NRRB = nonregistered recreational boating

²For further explanation of this figure, please see the next section of this report.

³NA data were *not available* to estimate these values.

⁴Direct jobs only; indirect and induced were not calculated.

⁵Based partially on Palazzi's 1985 estimates, which relied on user day figures provided by OSMB. The accuracy of these figures, and those derived from them, is uncertain.

Registered Recreational Boating

Registered recreational boating, which includes all motorized boats and sailboats 12 feet or more in length, constitutes a significant, growing portion of recreational boating in Oregon. In fact, the number of boats registered with OSMB has increased from approximately 46,000 in 1962 to over 190,000 in 1996. Furthermore, boat registrations in Oregon are expected to continue to grow at least as fast as population growth and perhaps faster (OSMB 1996).

During summer 1996, with funding from Oregon Sea Grant and OSMB, we conducted a study to determine the economic impact of registered recreational boating in Oregon. Our goal was to evaluate spending by boaters and to determine how that spending affects the state economy through the generation of personal income and employment.

Methods Used

To obtain information about registered recreational boating activities and expenditures, we mailed a questionnaire to a random sampling of 216 registered boat owners in July 1996. Basing our methods on the approach used by Palazzi (1986), we selected addresses from a database of over 164,000 Oregon registered boats 12 feet or greater in length. The size of the sample was constrained by the limited resources available for this study.

A four-part mailing procedure based on Salant and Dillman (1994) was implemented. The mailing consisted of a letter seeking participation from addressees, a questionnaire, and a follow-up reminder postcard. Finally, another questionnaire was mailed to each addressee who had not yet submitted a completed survey. To optimize response rates, we sent the mailings over the course of four successive weeks.

Staff at the Survey Research Center of Oregon State University reviewed the survey instrument for style and effectiveness. The survey was designed to acquire information on boater activities, boater trip expenditures, and boater ownership expenditures from September 1, 1995 to August 31, 1996.

Results

Of the 216 questionnaires mailed, 8 were unclaimed or undeliverable. Of the remainder, 147 were completed and returned for a response rate of nearly 71 percent. We based our estimates of registered recreational boating expenditures on these returned surveys.

Boating Expenditures by Respondents

To determine the economic impact of registered recreational boating in Oregon, we sought information on boaters' trip-related and annual boat-related spending. A total of 140 respondents (95 percent) provided at least some information on trip-related expenditures (table 2). Responses indicate that these 140 boaters spent an average of \$145.47 per boat trip ($\$20,366/140 = \145.47) or \$77.38 per boating day in 1995 ($\$145.47$ per boat trip/1.88 boating days per boat trip).

A total of 142 boaters (97 percent of respondents) responded to the survey question that sought information on annual boat-related expenses associated with boat ownership and maintenance (table 3). These respondents spent a total of \$420,396 for all categories for an average annual expenditure of \$2,960.54 per registered boat.

Some per trip and annual expenditure categories were similar (fuel and oil), and although respondents were asked to distinguish between such spending, double-counting with negligible results may have occurred in these categories.

Table 2. Boating expenditures per trip

Survey Category	Aggregate Expenditures (\$)	Expenditures per Boater per Trip (\$)	% of Total per Survey Category
Retail trade	5,921.45	42.30	29.08
Restaurants and taverns	1,608.00	11.49	7.90
Hotel and motel lodging	778.00	5.56	3.82
Other lodging	1,625.00	11.60	7.98
Agency user fees	1,559.00	11.14	7.65
Travel expenses	4,625.55	33.04	22.71
Fuel and oil (boat)	3,026.00	21.61	14.86
Docking fees, etc.	1,152.00	8.23	5.66
Equipment rental	71.00	0.50	0.35
Total	20,366.00	145.47	100

Survey Category	Aggregate Expenditures (\$)	% of Total
New expenses	324,475	77.20
Repairs and maintenance	28,913	6.90
Out of season storage	1,755	0.40
Insurance	13,775	3.30
Fuel and oil	31,903	7.60
Docking and moorage fees	18,675	4.40
Equipment rental	900	0.20
Total	420,396	100

Table 3. Annual boat-related expenditures

Statewide 1995 Trip and Boat-Related Registered Recreational Boating Expenditures

To estimate the economic impact of registered recreational boating in Oregon, we expanded the survey results for trip and boat-related expenditures to represent all registered boats. Because the survey did not poll boats of less than 12 feet, the results likely are biased toward boats 12 feet and over.

Trip-Related Expenditures

To calculate total statewide direct expenditures associated with registered recreational boating trip activities, we combined expenditure information with information from other sources and expanded the data proportionately to estimate total statewide expenditures for all registered boats.

In 1995, Oregon boaters accumulated an estimated 3,904,000 boating days. The average boater took 12.9 boat trips 1.88 days long, thus accruing 24.2 boating days (OSMB 1996). Since the average expenditure per boater per trip in 1995 was \$145.47, we calculated total direct trip-related expenditures as follows:

$$\begin{aligned} \text{total direct expenditures} &= (\text{total number of 1995 boating days} / \text{number of} \\ &\quad \text{days per trip}) \times (\text{cost per trip}) \\ &= (3,904,000 \text{ days} / 1.88 \text{ days/trip}) \times (\$145.47/\text{trip}) = \$302,082,382 \end{aligned}$$

Hence, total statewide direct expenditures associated with registered recreational boating trips from September 1, 1995 to August 31, 1996 were approximately \$302 million.

Boat-Related Expenditures

Similarly, we calculated total direct statewide expenditures resulting from registered boat ownership as follows:

$$\text{total direct expenditures} = \frac{(\text{aggregate sample expenditures})}{(\text{number of respondents})} \times \text{number of}$$

$$\text{registered boats} > 12 \text{ ft.} = (\$420,396 / 142) \times 164,334 = \$486,516,593$$

Hence, total statewide annual boat-related expenditures for boats at least 12 feet long from September 1, 1995 to August 31, 1996 were estimated to have exceeded \$486.5 million (table 4).

Total Estimated Economic Impact of Registered Recreational Boating in Oregon

To estimate the total economic impact of registered recreational boating that resulted from boater expenditures in 1995, we used an economic input-output analysis tool called IMPLAN (impact analysis for planning). We used allocations for water-based recreation to proportionately spread direct expenditures throughout the input-output model's sectors. The model was then run by computer to produce estimates of Oregon personal income and employment generated in association with spending by boaters.

We projected the economic impact from boat-related expenditures by applying estimates for boats surveyed to all registered boats in Oregon. This approach assumes that boat-related spending patterns for the 164,334 registered boats longer than 12 feet are representative of all 191,915 boats registered in Oregon in 1995. Projections for annual boat-related expenditures for all registered boats suggest that these expenses exceeded \$556 million in 1995 (table 4). On the basis of these projections, registered recreational boating was associated with over \$858 million in total expenditures, \$537 million in total personal income, and 25,595 employment positions.

	Economic Impacts		
	Expenditures (\$)	Personal Income Generated (\$)	Employment (number of jobs)
Trip expenditures	302,082,382	173,603,809	7,809
Boat expenditures	556,436,162	364,350,355	17,786
Total	858,518,544	537,954,164	25,595

Table 4. Total estimated economic impacts of Oregon registered recreational boating in 1995

Commercial Motorized Recreational Boating

Commercial motorized recreational boating encompasses a broad range of activities and businesses. These businesses can generally be categorized according to the types of services they provide—excursion outings, ocean fishing charters, and coastal aquatic nature-based tourism. Commercial motorized recreational boating opportunities can be found in many areas of Oregon, including off the coast, on the Columbia and Willamette rivers, and along stretches of beautiful white-water rivers.

Excursion Outings

Excursion outings comprise two types of boating experiences—river excursion trips and motorized tour boat trips. Both activities generally use freshwater or inland stretches of river, although tidally influenced stretches of some rivers are used extensively by a number of commercial river excursion and motorized tour boat firms.

River Excursion Trips

In late spring and early summer of 1996, we conducted telephone and in-person interviews with owners or operators of river excursion firms. The goal of these interviews was to seek information such as the geographic distribution of the river excursion industry; the nature of services; and the magnitude of the industry in terms of number and types of vessels, annual passenger counts, revenue generated, and employment.

The interview process revealed that the river excursion industry in Oregon is composed of two fundamentally different subsegments, characterized as the “day” subsegment and the “overnight” subsegment. Little is known of the scope and impact of the overnight excursion industry subsegment, and our attempts to establish contacts with industry insiders met with limited success. Where contacts were made, operators were typically reluctant or unable to release information.

For purposes of this study, day river excursion trips, or day excursions, are defined as riverboat excursion cruises not exceeding one calendar day. Typical day excursions are no more than a few hours long, and meal service is often provided along with the sightseeing experience. Telephone interviews were conducted with seven different day excursion owners or operators to determine the following:

- Business ownership (private vs. public)
- Number of vessels operated by firm
- Business location
- Estimated number of similar businesses or vessels in area of operation
- Vessel capacities
- Annual number of trips and annual passenger counts
- Annual revenue generation
- Number of employees on payroll

Because of the sensitive nature of some of the questions, interviews produced a limited amount of useful information. However, a general picture of the economic scope and magnitude of the day excursion industry emerged from the process.

The bulk of day excursion activity in Oregon operates out of the Portland area. The seven individuals interviewed accounted for the operation of 10 day excursion vessels in 1995–1996, with all but one operating primarily on the Willamette and Columbia Rivers. The one exception was docked in Florence on the Siuslaw River estuary. These 10 vessels likely constituted most if not all of the 1995–1996 day-excursion industry in Oregon, although it is possible that we overlooked some other operators.

Most operations were relatively small, family-run businesses, although several vessels were operated by out-of-state corporations. These vessels ranged in passenger capacity from 49 to 540, and annual passenger counts per firm ranged from less than 10,000 to approximately 100,000. Estimates placed total 1995 passenger counts for all day river excursion vessels at 275,000 passengers. According to industry representatives, 1995 revenue generated from ticket sales exceeded \$5.5 million. All told, the day excursion industry in Oregon employed at least 190 individuals as full- or part-time (seasonal) workers in 1995.

Commercial Motorized Tour Boat Trips

Motorized tour boat operations have experienced continuous growth in Oregon over the course of several decades. Motorized tour boats, often referred to as “jet boats” by the public, are capable of navigating stretches of river normally inaccessible to more conventionally powered motor boats. Motorized tour boat trips provide unique opportunities to water recreationists and serve as substantial attractions to visitors within and outside of Oregon. Most motorized tour boat trips are completed within one day.

Statewide Motorized Tour Boat Use

Historically, virtually all motorized tour boat use in Oregon occurred on the Rogue and Snake Rivers, and the same is true today. Statewide, motorized tour boat boating days have shown net increases, approaching 162,000 in 1995. Hence, indications are that the industry has continued to experience net growth, although rates of growth have slowed in recent years (figure 1).

The Economic Impact of Motorized Tour Boats

Revenues generated by motorized tour boats operating on Oregon rivers provide perhaps the best available indicator of the direct economic impact of motorized tour boating. The purchase of a ticket for a motorized tour boat excursion represents a trip expenditure for motorized tour boat patrons. On designated Wild and Scenic Rivers, water-based commercial operators are required to report revenues from ticket sales to permitting agencies. Revenue figures for operators providing tours of the Rogue River between Grants Pass and Gold Beach reported combined 1995 revenues from ticket sales of 5.2 million dollars. In addition, Snake River operators reported revenue from 1995 ticket sales of more than \$1.9 million. Total revenues from ticket sales for motorized tour boat excursions on Oregon rivers exceeded \$7.24 million in 1995. Approximately 20 firms operated on Oregon rivers in 1995, providing employment for an unknown number of Oregon and non-Oregon residents.



Figure 1. Oregon motorized tour boating days. Sources: Austermuehle 1995; Austermuehle 1996; Cole et al. 1996; and D. Johnson 1996

Ocean Charter Fishing Background

Ocean charter boat fishing has long been an important component of many coastal communities in Oregon. Charter fishing attracts coastal residents and visitors from other regions of Oregon, as well as visitors from out of state. Charter boat patron expenditures for goods and services such as food and beverages, overnight accommodations, and charter fishing trips constitute an economic impact in communities where charter fleets operate. Furthermore, out-of-region and out-of-state charter fishing patrons accrue travel costs when traveling to Oregon ports to participate in ocean fishing. These travel expenditures affect the destination community and other communities en route.

From the 1950s to the 1970s, the charter fleet focused its efforts almost entirely on salmon. However, beginning in the mid-1970s, multiple factors contributed to abrupt declines in salmon harvests. Subsequently, salmon harvest by Oregon charter boats has experienced net declines since the late 1970s. This decline has impaired the Oregon coastal charter industry's ability to attract patrons who were once drawn to Oregon for its well-known abundance of coho and chinook salmon. The net impact on the ocean charter fishing industry has been declines in annual numbers of actively fishing charter boats, charter boat trips, and angler trips.

According to Oregon Department of Fish and Wildlife (ODFW) statistics, the annual number of boat trips for the sum of all charter fishing modes has experienced a net decrease from 14,181 in 1979 to 4,727 in 1995 (Schindler 1996). Likewise, total annual angler trips have experienced a net decrease since 1979. However, the decline in ocean charter boat fishing

patronage has been partially offset by the development of nearshore bottom fishing. Charter boat angling days for bottom fish have increased steadily for the last 15 years, rising from slightly more than 16,000 in 1979 to a record level of 37,500 in 1995. This increased focus on bottom fishing has helped the Oregon charter fleet to offset net declines in revenue associated with substantially decreased recreational harvest of salmon stocks (figure 2).

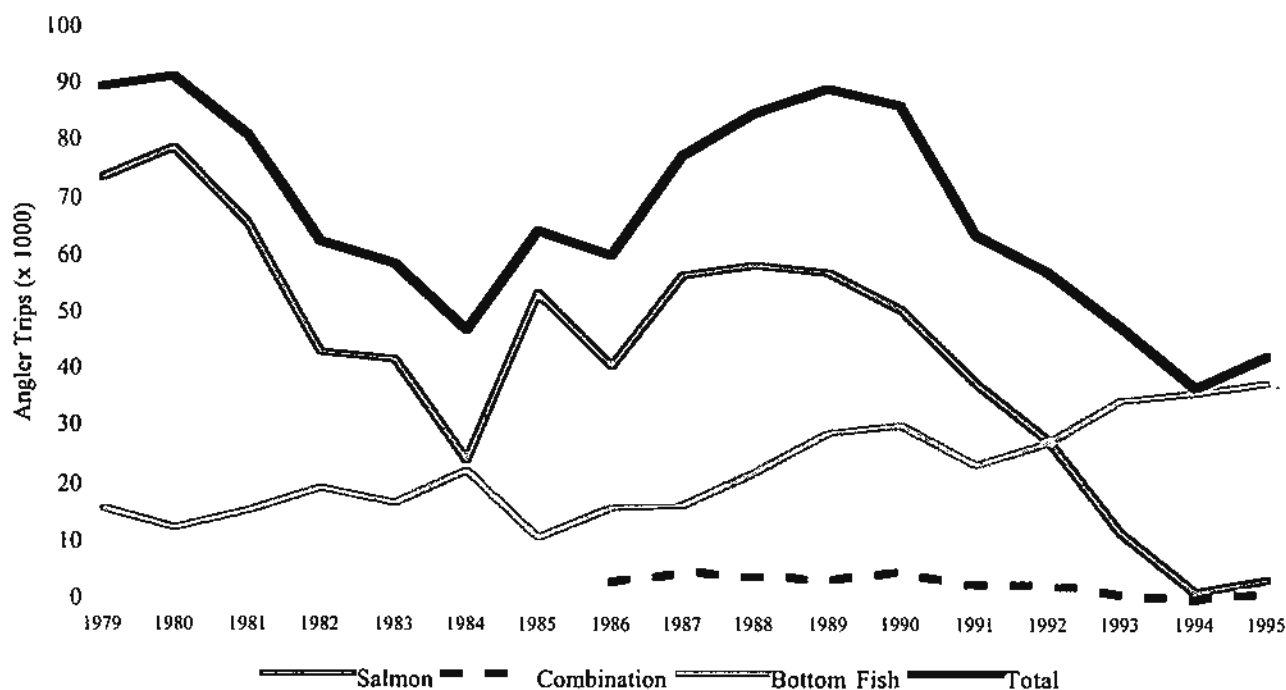


Figure 2. Charter angler trips by species. Source: ODFW

Estimating the Economic Impact and Trends of Ocean Charter Fishing in Oregon

To estimate the economic impact of ocean charter fishing, we used 1990 expenditure patterns provided by Davis and Radtke of the Research Group. The 1990 dollar amounts were adjusted to 1995 values using the Consumer Price Index for all Urban Consumers. Two separate expenditure patterns, one for salmon angling and one for marine or bottom-fish angling, were combined with information from ODFW to calculate total 1995 Oregon trip expenditures for charter angling. Although ODFW estimates of annual angling trips have a category for "combination" trips, no such expenditure pattern was available. Hence, we assumed that combination trips included bottom fishing, and so we added these numbers to ODFW figures for bottom-fishing angler trips. In addition, IMPLAN-derived industry income coefficients were used to calculate total 1995 personal income impacts attributable to trip expenditures of charter boat patrons.

Trip expenditures for salmon charter anglers included "at home," "en route," and "destination" area expenses for nine categories. Twenty-nine percent of salmon charter anglers reside in the coastal region; the remainder are visitors from other, noncoastal regions. This suggests that salmon charter fishing constitutes a significant economic export for the home ports of charter fleets. The average expenditure per angler per trip in 1995 for an

ocean charter boat salmon trip was \$108.00 (table 5). Of this amount, 5 percent was spent in the area in which the angler lived, 4 percent was spent en route to the destination, and 91 percent was spent in the coastal destination community. There were approximately 3,500 charter boat angler trips for salmon fishing in 1995, bringing the total trip expenditures related to ocean salmon charter fishing to \$378,000.

Table 5. Trip expenditures for ocean charter anglers in 1995 (\$). Source: ODFW 1996, The Research Group 1991

Category	At home		En Route		Destination		Total (per trip)		Total (all anglers)	
	Salmon	Bottom	Salmon	Bottom	Salmon	Bottom	Salmon	Bottom	Salmon	Bottom
Transportation, gas, etc.	2.58	1.13	2.06	3.19	5.25	2.12	9.89	6.44	34,615	248,584
Lodging	0	0	0	0.27	6.98	8.37	6.98	8.64	24,430	333,504
Retail food and drinks at stores	2.41	0	0.29	0.21	4.16	5.04	6.86	5.25	24,010	202,650
Restaurants	0	0	1.50	1.81	12.42	11.61	13.92	13.42	48,720	518,012
Charter fees	0	0	0	0	46.87	54.88	46.87	54.88	164,045	2,118,368
Boat gas	0	0	0	0.53	0	0	0	0.53	0	20,458
Equipment rental	0	0	0	0	19.48	5.28	19.48	5.28	68,180	203,808
Supplies and misc.	0	0	0	0	1.82	0	1.82	0	6,370	0
Other	0.63	0	0	0.05	1.55	4	2.18	4.05	7,630	156,330
Total Expenditures	5.62	1.13	3.85	6.06	98.53	91.3	108.00	98.49	378,000	3,801,714

Per angler trip expenditures for ocean bottom-fish charters were estimated in the same way as those for salmon trips. As with salmon anglers, a significant number (77 percent) of bottom-fish anglers are not residents of a coastal area, implying that charter fishing for bottom-fish species also represents a net service export for coastal ports. On average, 1995 expenditures per trip for bottom-fish charter anglers was \$98.49 (see table 5). Of this, 1 percent was spent at home, 6 percent was spent en route, and 93 percent was spent in the coastal destination community. In 1995, ODFW counted approximately 37,500 bottom-fish angler trips and 1,100 combination angler trips, bringing the adjusted total for bottom-fish angler trips to 38,600. Total trip expenditures for 1995 charter boat bottom fishing were approximately \$3.8 million.

Using IMPLAN-derived coefficients, we calculated personal income impacts resulting from salmon and bottom-fish charter angler trip expenditures. Average per angler impact on personal income was approximately \$86 and \$80 for salmon and bottom-fish angling, respectively. Hence, the 3,500 salmon charter trips in 1995 were associated with approximately \$301,000 in personal income. Similarly, the 38,600 bottom-fish charter angler trips in 1995 generated approximately \$3 million in personal income.

To calculate total trip expenditures and personal income impacts resulting from Oregon charter boat fishing, we added totals for salmon and bottom-fishing trips (table 6). The results indicate that the total patron trip

Table 6. Total 1995 trip expenditures and personal income generated by Oregon ocean charter boat angling (\$). Source: ODFW 1996, The Research Group 1991

Trip Expenditures			Personal Income Generated		
Salmon	Bottom	Total	Salmon	Bottom	Total
378,000	3,801,714	4,179,714	301,625.7475	3,096,420.6	3,398,046.3

expenditure for 1995 Oregon ocean charter boat fishing was approximately \$4.1 million and the total personal income associated with this spending was approximately \$3.4 million.

As indicated by patron expenditure patterns, most charter anglers come to the coast from outside the coastal region. In addition, most patron expenditures occur in the destination community, implying that Oregon charter boat fishing represents a significant regional economic export that brings new dollars to the state's coastal region. These new dollars have a state-wide economic multiplier effect, resulting in economic benefits for coastal communities and Oregon. Hence, although it is probable that customer expenditures and related economic impacts associated with the charter boat industry have realized a net decrease since at least 1979, the industry still constitutes an important component of commercial motorized recreational boating in Oregon.

Coastal Aquatic Nature-Based Tourism

As a form of recreation, "eco-," or "nature-based," tourism has continued to experience growth along the Oregon coast. Primarily driven by the presence of resident and migratory populations of marine mammals, aquatic nature-based tourism has provided opportunities for the expansion of commercial motorized recreational boating. To date, at least one enterprise operating a vessel along the Oregon coast specializes in providing coastal visitors and residents with educational estuarine or ocean "ecocruises." Others, such as ocean fishing charter boats, offer whale-watching cruises depending on demand and fishing conditions.

Undoubtedly, aquatic nature-based tourism accounts for a significant portion of the economic impact associated with coastal commercial motorized recreational boating. Furthermore, it is likely that additional declines in ocean fisheries allocations will compel some members of the ocean charter fishing fleet to shift their efforts to aquatic nature-based tourism. In general, however, such tourism as a component of coastal recreational boating is a relatively new phenomenon. Hence, little is known of its present or projected impact on the economies of coastal communities.

Conclusion

Commercial motorized recreational boating in Oregon is loosely composed of a variety of components. They include excursion outing enterprises offering day and overnight river cruises and motorized tour boat trips; coastal aquatic nature-based tourism, or ecocruises; and ocean charter boat fishing trips. Little is known of the economic impacts associated with coastal aquatic nature-based tourism. From the remainder of commercial motorized recreational boating, however, sufficient information was available to make a

conservative estimate of 1995 trip expenditures for day river excursions, motorized tour boat trips, and ocean charter fishing trips (table 7). Minimum trip expenditures in the case of day river excursions and motorized tour boat trips included ticket fees. Charter boat expenditures included purchases described in the patron expenditure survey categories. Altogether, known commercial motorized recreational boating trip expenditures in 1995 totaled nearly \$17 million.

Table 7. Estimated minimum 1995 trip expenditures for CMRB

CMRB Subcomponent	Estimated Minimum Expenditures (\$)
Day river excursion	5,500,000
Motorized tour boat trips	7,240,000
Ocean charter boat trips	4,179,714
Total	16,919,714

Nonregistered Recreational Boating

Today, as in the past, an important share of recreational boating activity takes place in nonmotorized, nonregistered craft such as inflatable rafts and kayaks, hard-shelled kayaks, canoes, and drift boats. Oregon provides literally thousands of miles of rivers suitable for use by recreational floating craft. Rivers such as the McKenzie, the North Umpqua, the Rogue, and the Deschutes are well known by white-water enthusiasts, anglers, and paddlers of all ages. Many other rivers provide opportunities for more casual nonmotorized boating experiences. Another important form of nonregistered recreational boating in Oregon is windsurfing. From the late 1980s to the early 1990s this sport experienced rapid growth in the Columbia River Gorge, where conditions are typically ideal for sail boarding. Be it rafting or windsurfing, enthusiasts of nonregistered recreational boating make significant contributions to Oregon's economy through travel expenditures and equipment purchases.

The Economic Impact of Windsurfing in the Columbia Gorge Background

In the mid-1970s, several pioneering board sailors discovered that the Columbia Gorge has ideal windsurfing conditions. By the 1980s, an increasing number of windsurfers were attracted to the area which, in turn, attracted board, sail, and windsurf accessory designers to Gorge communities such as Hood River (Povey 1990).

In 1990, the University of Oregon's Community Planning Workshop conducted a study to assess the magnitude and patterns of windsurfer expenditures in the Gorge and to project future rates of growth for the sport. The results of this study are summarized below.

Results

From mid-June to mid-September 1990, researchers at the University of Oregon conducted a 10 percent sample survey of Gorge windsurfers. The survey sought information on windsurfer characteristics and expenditures. Over 1,100 surveys were completed and, after the researchers corrected for sampling error, they estimated the total 1990 Gorge windsurfing population to be 9,650.

Respondents were asked to estimate their expenditures in each of nine separate categories (table 8). Results show that the total average daily expenditure for a 1990 Columbia River Gorge windsurfer was \$69.90 per windsurfer per day of windsurfing. Hence, the estimated 1990 direct economic impact of expenditures by Gorge windsurfers from June 15 to September 15 was over \$16.5 million in 1990 dollars (table 9).

In 1990, it was projected that Gorge windsurfing visits and associated visitor expenditures would continue to increase through at least 1995. Original projections estimated that the 1995 Gorge windsurfing population would exceed 15,000 board sailors with expenditures of \$34.2 million. In retrospect, these figures likely overestimated the growth of the sport. According to Povey, the growth of Gorge windsurfing leveled off in 1992 and has remained stable since then. Hence, the 1995 direct economic impact of the sport is estimated to have been \$21 million (in 1990 dollars.)

Table 8. Average daily expenditures for windsurfers in the Columbia River Gorge in 1990. Source: Povey 1990

Category	Expenditures (\$)
Meals/food	14.95
Beverages	4.92
Lodging	9.64
Entertainment	2.83
Fuel costs	5.82
Sailboard equipment	25.24
Sailboard lessons	2.37
Clothing	3.48
Other	.65
Total	69.90

Table 9. Direct economic impact of windsurfing in the Gorge in 1990. Source: Povey 1990

Sample Size	Total Windsurfers	Average # of Days	Total Windsurf Days	Average \$ Per Day	Estimated Direct Impact (\$)
965	9,650	24.6	237,390	69.90	16,593,561

The Economic Impact and Trends of Nonregistered River Boating Background

Nonregistered river boating is typically characterized as "white-water recreation," although not all nonregistered boating occurs on rivers known for white-water experiences, nor is nonregistered river boating pursued exclusively as an activity in and of itself. Typically, these recreationists, be they anglers, white-water enthusiasts, or casual drifters, use nonmotorized, nonregistered craft such as inflatable rafts and kayaks, hard-shelled kayaks, canoes, and drift boats.

Literally thousands of miles of rivers and streams in Oregon are suitable for recreational floating. However, most recreational float use likely occurs on systems with some degree of scenic or wilderness value that enhances the boating or angling experience. Such systems are typically characterized by what river recreationists refer to as "white water" (Shelby et al. 1990).

Each year, hundreds of thousands of nonregistered boating days occur on Oregon river systems. Visitors from other states travel to Oregon to experience its beautiful rivers. Oregonians travel extensively within the state, often drawn to other regions by the attraction of a white-water rafting trip on the Rogue River or a guided fishing trip on the Deschutes River. These and other shorter trips typically involve expenditures on items such as food and beverages, lodging, and outfitter-guide fees.

However, it is important to note that not enough is known about statewide float user demographics and spending patterns to suggest that all jobs associated with recreational floating are also dependent on recreational floater expenditures. If recreational float use were to decline dramatically, some jobs would likely disappear. Nonetheless, some recreational floaters would continue to spend money on other forms of outdoor recreation that would offset to a degree any losses associated with a decline in float use.

Results

To assess the economic impact of nonregistered river boating, we needed two fundamental pieces of information: the number of boating days annually attributable to nonregistered boating use and the spending patterns of the participants.

To determine float use levels, we obtained use data for 11 rivers from various federal and state managing agencies, including the USDA Forest Service, the U.S. Bureau of Land Management (BLM), and the Oregon Parks and Recreation Department (OPRD) (table 10). When available, data for commercial vs. noncommercial use and data for historical use patterns were obtained to establish total statewide recreational floating trends and use levels that could be used to estimate economic impacts.

River	User Days		
	Commercial	Noncommercial	Total
Clackamas	NA	3,019	3,019
Deschutes (lower)	42,598	85,514	128,112
Deschutes (upper)	42,258	NA	42,258
Grande Ronde	1,917	5,597	7,514
Illinois	NA	367	367
Klamath (upper)	5,763	602	6,365
McKenzie	2,950	NA	2,950
Metolius	NA	500	500
North Umpqua	1,703	3,285	4,988
Owyhee	1,759	9,274	11,033
Rogue	25,583	47,292	72,875
Snake	7,887	16,982	24,869
Total	132,418	172,432	304,850

*Table 10.
Nonregistered
river boating
user days in
1995. Source:
BLM 1995,
USDA Forest
Service 1995;
Brutscher
1996*

Use levels reflect "user" days, typically defined as all or part of one day spent by a single participant in pursuit of the activity of note. Hence, a rafter who took a two and one-half day trip on the Rogue River accounted for three user days.

The sources mentioned above indicate that there were 132,418 commercial user days and 172,432 noncommercial user days recorded for nonregistered boating in 1995, for a total verified use of nearly 305,000 user days on the 11 rivers for which data were obtained.

Historical trend data from the lower Deschutes River, the Wild and Scenic Rogue River, and the Wild and Scenic Snake River indicate that total nonregistered boating use on these three rivers has increased by more than 70,000 user days, or 47 percent, since 1985 (figure 3). Similar trends have been documented on other Oregon rivers, including the Grande Ronde, the upper Klamath, and the North Umpqua. Furthermore, few white-water recreation rivers show any declines in use over the last 10 or 20 years. Cumulatively, these data suggest that the white-water recreation or "floating" segment of nonregistered recreational boating has experienced steady growth since at least 1985.

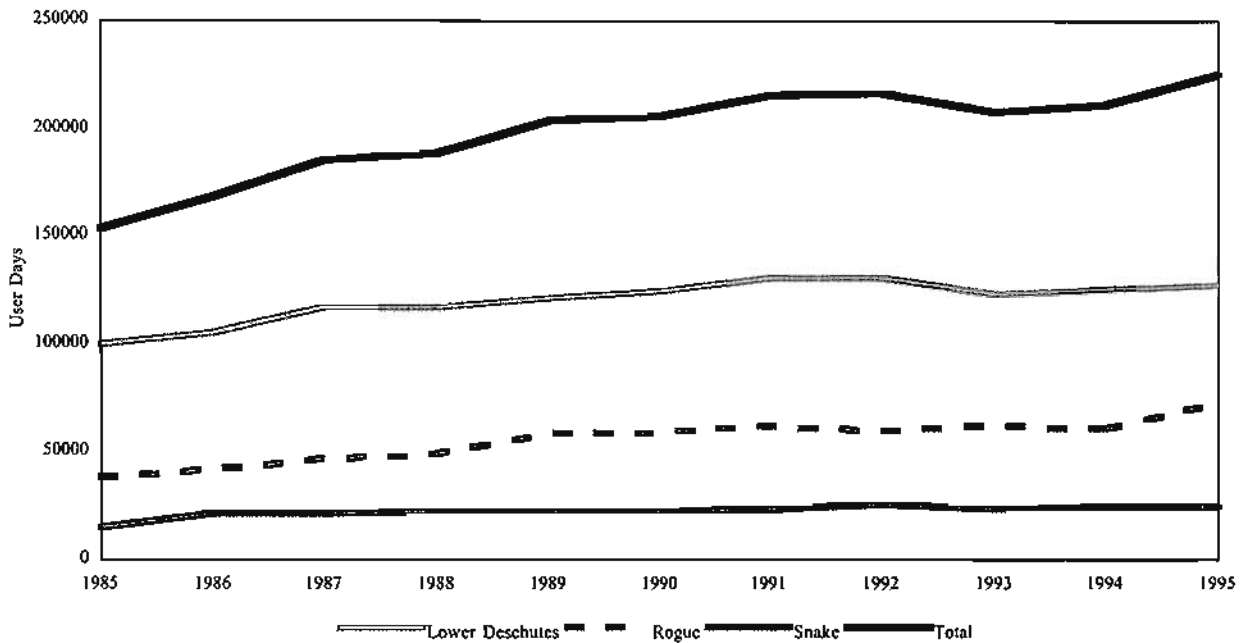


Figure 3. Nonregistered river boating use trends. Source: BLM, OPRD, USDA Forest Service

To assess the economic impact of recreational floating, we coupled trip expenditure patterns for white-water recreationists with use data for the 11 rivers listed above. The expenditure patterns were obtained from a 1988 survey of Clackamas white-water recreationists.

We adjusted dollar amounts for 1988 to 1995 values using the Consumer Price Index for all Urban Consumers. Categories and related expenditures are summarized in table 11. The original survey contained an expenditure category called "miscellaneous." For our study, we assumed that miscellaneous expenditures fall into the retail category. Hence, we used only five expenditure categories.

To estimate the economic impact of commercially guided trips, we aggregated 1995 commercial float use data for eight rivers to calculate an average statewide guide fee of \$79.97 ($\$10,311,244/128,934$ user days = \$79.97/user day) (table 12).

To calculate estimated expenditures and economic impacts, we allocated the five Clackamas expenditure categories and the guide fee above proportionately to relevant IMPLAN sectors for water-based recreation. We allo-

Table 11. Adjusted 1995 expenditures for Clackamas boaters. Source: Shelby et al. 1990.

Category of Expenditure	Dollars (\$)
Gasoline and oil	12.37
Restaurants and taverns	9.56
Lodging and camping	3.63
Raft and equipment rental	2.45
Retail (groceries, etc.)	12.74
Total	40.75

River	User Days	Commercial Revenue (\$)
Deschutes (upper)	42,258	1,479,030
Deschutes (lower)	42,598	3,490,432
Grande Ronde	1,917	223,144
Klamath (upper)	5,763	478,666
McKenzie	2,950	155,374
Owyhee (entire system)	2,251	77,128
Rogue (Wild section)	23,310	3,241,349
Snake	7,887	1,166,121
Total	128,934	10,311,244

Table 12. Estimated 1995 commercial guide fee. Source: BLM 1995, OPRD 1995, USDA Forest Service 1995

cated per trip expenditures for commercial and noncommercial trips, thus constructing two different allocation patterns for the input-output model. The only difference in these patterns was the inclusion of a \$79.97 guide fee under IMPLAN sector 488 (amusement and recreation services) for guided trips. Hence, we estimated user expenditures per trip per day at \$40.75 for noncommercial, unguided trips and \$120.72 for commercially guided trips.

Each of these two allocation patterns was subsequently used to calculate total statewide expenditures associated with verified user days. Statewide expenditure amounts for each IMPLAN sector were then run by IMPLAN software to generate estimates of economic impacts, including personal income and employment associated with boater expenditures.

We estimated that total statewide expenditures for known user days, commercial and noncommercial, reached \$23 million in 1995. According to input-output model results, this spending was associated with an estimated \$14.7 million in personal income and 688 jobs in 1995 (table 13).

Table 13. Estimated 1995 economic impact of recreational floating for known user days

Use Type	Expenses per User Day (\$)	# of User Days (Known)	Total Expenditures (\$ (Statewide))	Estimated Economic Impact	
				Personal Income Generated	Employment (jobs)
Commercial	120.72	132,418	15.99 million	10.21 million	478
Noncommercial	40.75	172,432	7.03 million	4.49 million	210
Total		304,850	23.02 million	14.70 million	688

These estimates, while significant, are conservative for several reasons. For example, Clackamas expenditure patterns were based primarily on one-day trips. Hence, spending for lodging and other overnight accommodations is not representative of trip expenditure patterns for many other Oregon rivers where recreationists often spend more than one night at area accommodations. Furthermore, these estimates are based on a known total of 304,850 user days accrued on 11 Oregon river systems in 1995. These use figures often do not account for off-season use levels on the 11 rivers, nor do they account for the use that occurred on other rivers and streams in 1995.

In addition, while model output showed that 1995 trip expenditures were associated with 688 jobs, OSMB records indicate that there were at least 1,100 registered outfitter-guides in Oregon in 1995.

To compensate for these conservative estimations of total float trip-related expenditures and economic impacts, we made several assumptions based on available information. These assumptions are outlined below.

Using information obtained from OSMB, Palazzi (1986) estimated that 1985 recreational floating activity accounted for approximately 1 million user days. To estimate 1995 use levels, we assumed that cumulative 10-year use trends for three primary Oregon white-water rivers are representative of statewide recreational float use growth trends for the same period. These trends (outlined in figure 3) show that recreational float user days for the Deschutes, Rogue, and Snake Rivers increased by 47 percent from 1985 to 1995. On the basis of this assumption, we estimated total 1995 recreational float use at 147 million user days. We subsequently delineated these assumed user days as commercial or noncommercial, based on the ratio of known commercial to known noncommercial 1995 user days. This approach yielded totals of 632,100 (43 percent) commercial user days and 837,900 (57 percent) noncommercial user days attributed to recreational floating in 1995. (It should be noted that the uncertainties in our assumptions likely affect our final estimates for recreational floating.)

We estimate that total recreational float use in 1995 accounted for over \$110 million in direct expenditures. Furthermore, input-output model results suggest that spending for recreational floating, nonregistered recreational boating trips was associated with approximately \$70.56 million in total personal income and approximately 3,302 jobs (table 14). Recreational float use of Oregon rivers is shown to play a major role in terms of the economic impacts generated from direct expenditures and those generated from indirect and induced effects.

Conclusion

Nonregistered recreational boating in Oregon is known to include a variety of water craft as well as users. Expenditures by Columbia Gorge windsurfers in 1995 are estimated to have had a direct economic impact of \$21 million in Gorge communities. This spending, when added to projected boater expenditures for white-water recreation, brings the total for 1995 nonregistered recreational boating-related expenditures to an estimated \$131 million in direct economic impact.

Table 14. Economic impact of recreational floating for 1995 estimated user days, based on Palazzi 1986

Use Type	Expenses per User Day (\$)	# of User Days (Approx.)	Total Expenditures (\$) (Statewide)	Estimated Economic Impact	
				Personal Income Generated (\$)	Employment (jobs)
Commercial	120.72	632,100	76.31 million	48.75 million	2,280
Noncommercial	40.75	837,900	34.14 million	21.81 million	1,022
Total		1,470,000	110.45 million	70.56 million	3,302

The Marine Trades: Manufacturing, Sales, and Services

Background

Because of a lack of recent secondary data on Oregon marine trades, we could not make a comprehensive and inclusive assessment of the magnitude of the industry. Furthermore, a portion of the economic impact that results from boater expenditures accrues to sectors other than those encompassed by the marine trades (for example, restaurants, lodging, and travel). Previous sections of this report describe alternative methods that were used to estimate the comprehensive economic impact of boating activities. These methods focus on obtaining estimates of boater expenditures to all relevant economic sectors. The following paragraphs provide a description of the marine trades based on available information.

The marine trades in Oregon encompass a broad range of enterprises that are described here using Standard Industrial Classification (SIC) data from the Oregon Department of Employment (personal communication) and other published sources (Palazzi 1986, Benyounes 1993). However, because some boater expenditures go to sectors not represented by any comprehensive SIC, these data sources cannot be used to account for all boater expenditures. Therefore, the information described in this section should serve only as a point of comparison for estimates of economic impact derived from boating activities and presented in other sections of this report. In any case, there is significant overlap between boater expenditures and marine trades' sales revenues.

Marine trades in Oregon are divided into the following sectors:

- *Marine manufacturing*, which includes boat building and repairs contained in SIC 3732 and other marine-related product manufacturing dispersed among several other SICs
- *Marine wholesale trade*, which includes all firms that sell boats, boat trailers, boat motors, and other boat-related equipment at the wholesale level. This sector is dispersed among many SICs.
- *Marine retail trade*, which includes all firms that sell boats, boat trailers, and other boat-related equipment at the retail level. The majority of activities in this marine trades sector are contained in SIC 5551 (boat dealers).
- *Marinas, moorage, and other marine transportation services*, which primarily provide rental moorage space and associated services, most of which are contained in SIC 4493 (marinas)

Results

Payrolls, average employment, and number of enterprises in 1995 for SICs 3732, 5551, and 4493 were acquired from the Oregon Department of Employment. These three SICs accounted for 156 enterprises employing over 1,500 persons at a total payroll of over \$35 million in 1995 (table 15).

Since SICs do not differentiate between commercial and recreational enterprises, figures likely include enterprises engaged in marine trades manufacturing, sales, and services for commercial uses. In addition, because no single SIC encompasses the marine wholesale trade sector, payroll, employment, and the number of firms for this sector were unavailable.

Table 15. Economic description of the Oregon marine trades in 1995. Source: Oregon Department of Employment 1996

Sector	SIC	Number of Enterprises	Average Employment	Annual Payroll (\$)
Marine manufacturing	3732 boat building and repair	48	900	20,295,754
Marine retail trade	5551 boat dealers	70	454	11,578,774
Marinas moorage	4493 marinas	38	172	3,189,166
Total		156	1,526	35,063,694

Published data on sales for the firms represented by SICs 3732, 5551, and 4493 were not available. However, on the basis of information from Palazzi (1986), we estimated sales for Oregon marine trades sectors by applying the Consumer Price Index for all Urban Consumers to adjust Palazzi's 1985 estimates to 1995 values. Palazzi's estimates were based on a combination of sources, including a contemporary comprehensive assessment of Washington marine trades sectors and a verified listing of similar Oregon businesses. Using this approach, Palazzi estimated that total 1985 Oregon marine trades sales were \$433.4 million (Palazzi 1986). Using a Consumer Price Index for all Urban Consumers of approximately 1.415 to adjust for inflation over this 10-year period, we estimated 1995 sales for Oregon marine trades enterprises at \$613 million ($\$433.4 \text{ million} \times 1.415 \sim \613 million).

Conclusions and Implications for the Future

Recreational boating in Oregon encompasses a broad range of activities, including registered recreational boating, commercial motorized recreational boating, and nonregistered recreational boating. Each year, millions of boating days occur on Oregon lakes, rivers, and coastal bays, and in the Pacific Ocean off the Oregon coast. In 1995, spending associated with these boating activities exceeded an estimated \$1 billion. A portion of this spending was associated with at least \$611 million in personal income and more than 28,000 employment positions for Oregonians (see table 1).

To appreciate the relative significance of boater spending for the Oregon economy, it is helpful to compare the figures presented in this study with other economic data. According to the results of an economic study of Oregon anglers, the estimated economic impact of recreational fishing activity in 1991 was approximately \$1.035 billion in equipment expenditures and over \$252 million in trip expenditures. Income associated with these expenditures was estimated at \$779 million and \$232 million, respectively (The Research Group 1991). A similar study sought to assess the economic impacts of outdoor recreation in Oregon. According to the results of this study, an estimated 25.5 million nonresidents visited Oregon in 1993 and participated in outdoor activities. The study of outdoor recreation estimated that these visitors contributed \$975.9 million in expenditures to Oregon businesses (R. Johnson et al. 1995). A more general study of tourism impacts estimated that direct sales to in-state and out-of-state travelers in 1994 were approximately \$3.9 billion (Dean Runyan Associates 1996). Based on these estimates, the magnitude of the economic impact of recreational boating is generally similar to impacts from other forms of outdoor and travel activities.

Of course, the impacts of boating recreation and other recreational activities account for a portion of a much larger and more complex state economy. According to summaries of the Oregon economy published by the Oregon Department of Administrative Services, total personal income associated with all economic activity in 1995 exceeded \$275 billion (ODAS 1997). Personal income generated by boater expenditures was approximately \$612 million, or about two-tenths of one percent of total Oregon personal income in 1995.

In general, recreational boating has experienced continuous growth in Oregon for decades. Continued state population growth combined with expected growth for recreation and tourism in Oregon suggests that user days and economic impacts associated with recreational boating activities will also continue to grow. Following are some activity-specific predictions for future trends in the various forms of Oregon recreational boating.

Registered Recreational Boating

Recent surveys of Oregon registered boaters suggest that registered recreational boating and associated economic impacts have grown significantly. Furthermore, trend data indicate that growth in the number of registered boats is expected to continue. On the basis of this information, we think it likely that registered recreational boating in Oregon will experience contin-

ued economic growth, though the rates and limits of this growth are uncertain.

Decision makers should continue to monitor the economic impacts of registered recreational boating in Oregon, and studies to assess these impacts should be conducted at least once every decade.

Electronic Communications—Trends and Implications

According to the results of the survey of registered boaters conducted for this study, a substantial number of boaters are well positioned technologically for anticipated Internet/World Wide Web (WWW) expansion by means of fiber optic cable television. This suggests that the Internet/WWW will likely become an increasingly viable alternative distribution method for boater information and education publications.

Commercial Motorized Recreational Boating

Commercial motorized recreational boating is composed of a variety of subindustries that provide a diverse slate of recreational boating opportunities. They include river excursions, coastal aquatic nature-based tourism, and ocean charter boat fishing.

Trend data and information obtained for this study suggest that commercial motorized recreational boating components such as day and overnight river cruising and motorized tour boat excursions are likely to experience no net declines in business. In some instances, growth may be likely. This could be particularly true for day or overnight river excursions on the Columbia and Willamette Rivers. Another commercial motorized recreational boating component that may experience growth is coastal aquatic nature-based tourism. Trend data for charter boat fishing, on the other hand, suggest that angling days may continue to decline. However, this decline may be somewhat offset by aquatic nature-based tourism activities such as whale watching. In general, however, commercial motorized recreational boating will likely be characterized by net growth in coming years.

Research opportunities abound where commercial motorized recreational boating is concerned. Decision makers may wish to consider future studies to determine (1) economic scope, magnitude, impact, and growth projections for river excursion activities and (2) economic scope, magnitude, impact, and growth projections for coastal aquatic nature-based tourism, including the extent to which ocean charter boat fishing can be expected to rely upon this attraction to offset losses associated with declines in salmon fisheries.

Nonregistered Recreational Boating

Trend data for various forms of nonregistered recreational boating indicate that both windsurfing and river float use have experienced growth in recent years. A study of the economic impact of windsurfing in the Columbia Gorge shows that user days and spending associated with this sport increased dramatically from the late 1980s to the early 1990s. More recent information suggests that growth has ceased, although there are no indications that the sport is experiencing a decline.

Since monitoring began, float use data for a number of Oregon rivers indicate that use has continuously increased on virtually all monitored rivers. Continued increases in use, along with associated increased economic

impacts, are likely. However, growth may be limited as carrying capacities for various rivers are approached.

Decision makers should focus future nonregistered recreational boating research efforts on river float use. Additionally, the use and associated economic impacts of nonregistered recreational boating activities such as sea kayaking, flat-water canoeing, and small (< 12 ft.) sailboating should be considered for investigation. Research should strive to verify total statewide use, as well as total use by type (commercial vs. noncommercial, angling vs. white water, and so on). Expenditure patterns for various types of nonregistered recreational boating activity should be applied to appropriate use data to establish a more accurate and complete picture of the economic impact of float use.

The Marine Trades

Continued anticipated increases in annual boating user days suggest that the marine trades should experience growth proportionate to increased consumer demand for boating-related goods and services. The magnitude and extent of this growth and related impacts are uncertain.

Decision makers should consider further, more intensive, study of marine trades sectors to define and determine the magnitude of the economic value of this integral component of the Oregon boating recreation industry.

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¹This publication relied upon numerous sources, not all of which are cited in this abridged version. For a complete listing of citations and references, please refer to the full version of this report, available from Oregon Sea Grant or the Oregon State Marine Board.

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