

## CALIFORNIANS' ATTITUDES TOWARD AND USE OF FISH AND WILDLIFE RESOURCES

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*Abstract:* A telephone survey of 2,526 Californians was conducted in May and June of 1987 for the purposes of: (1) describing consumptive and nonconsumptive fish and wildlife users in California, (2) identifying Californians' attitudes toward wildlife and state wildlife programs, and (3) determining attitudes toward funding approaches for nonconsumptive fish and wildlife programs. Respondents overwhelmingly agreed (86.1 percent) that fish and wildlife should be maintained even if it means higher consumer prices. Most respondents (72.5 percent) disagreed with the idea that there will be plenty of space in California for fish and wildlife even with increased housing and industrial development. Most respondents (72.3 percent) agreed that people who enjoy the state's outdoor resources should contribute financially to preserve fish and wildlife, even if they do not themselves hunt and fish. Respondents were segmented into seven groups on the basis of (1) amount of time spent outdoors and (2) participation in fish and wildlife-related recreation activities. All four groups that participate in fish and wildlife activities expressed strong support for entrance fees to fish and wildlife areas, conservation passes, and additional registration fees for boats and off-road vehicles (ORVs) as funding alternatives for nonconsumptive fish and wildlife programs. Less support was expressed for a \$1 additional Department of Motor Vehicles (DMV) vehicle registration fee and very little support was shown for a tax on outdoor sporting equipment.

Traditionally, hunters and anglers have provided the bulk of money for wildlife management through license fees, fines, and excise taxes on equipment and accessories. As a result, game species have been given greater emphasis than nongame species in wildlife management (Allen 1978) and most socio-psychological research has focused on consumptive users of wildlife, especially sport hunters (Shaw 1979). A growing body of research shows that Americans' enjoyment of wildlife is far from limited to consumptive uses (Kellert 1978, 1980a, Shaw and King 1980, Lyons 1982, Duda 1987). In fact, the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation showed that 83.2 million Americans aged 16 and older participated in nonconsumptive wildlife-associated activities, while only 42.1 million fished and 17.4 million hunted (USFWS 1982). The same study showed that 65 percent of all hunters and fishermen engaged in some type of nonconsumptive activity.

If nonconsumptive use is as significant as is reported, it is important to determine if nonconsumptive users are paying their fair share of the costs involved in managing wildlife. For 1987, the California Department of Fish and Game received 58.6 percent of its funds from hunting, fishing, and trapping licenses and fines, 20.1 percent from federal funds (primarily through Pittman-Robertson and Dingell-Johnson excise taxes on hunting arms and ammunition), and only 21.3 percent from state sources (S. Wolfe, pers. comm.). These figures support the contention of both Hooper (1980) and Lyons (1982)

that nonconsumptive wildlife users are largely non-paying customers.

Should hunters and anglers "pick up the tab" for nonconsumptive users? A study by Witter and Shaw (1979) showed that birders, hunters, and wildlife professionals all believed that the major part of nongame management funds should not continue to come from hunting and fishing licenses and fees. Therefore, nonconsumptive wildlife programs require the development of new funding alternatives.

The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reported that 71 percent of respondents favored new sources of nongame funding (Shaw and Mangun 1984). The most favored systems were those that were purely voluntary, such as income tax checkoffs or conservation stamps. Kellert (1980b) found that 71 percent of the public favored an excise tax on off-road vehicles (ORVs) and 75 percent favored entrance fees to public wildlife areas, including wildlife refuges. Only 57 percent approved of a sales tax on camping and backpacking equipment, 54 percent approved of a tax on birdwatching equipment, and 57 percent favored increasing the amount of general tax revenues allocated for wildlife management.

In order to gain further insight into the consumptive/nonconsumptive interface, a telephone survey of a representative sample of California residents was conducted by the Survey Research Center at California State University, Chico. This paper reports the portion of the survey that was concerned with identifying the nature of

consumptive and nonconsumptive use of fish and wildlife resources in California as well as determining Californians' attitudes toward wildlife, especially with respect to funding nonconsumptive fish and wildlife programs.

## METHODS

Survey data were collected via telephone interviews. The interview schedule was developed by the staff of the California Department of Fish and Game (CDFG) in consultation with researchers from California State University, Chico. After pretesting and revision, the final interview schedule was split into two forms to keep interview times to about ten minutes. A total of 1,259 (49.8 percent) of the respondents received Form A and 1,267 (50.2 percent) received Form B. Respondents who reported spending no leisure time outdoors (457 or 18.1 percent of the sample) or who reported no wildlife related activities were asked a smaller subset of questions.

The population sampled in this survey was all persons age 18 and above living in households with telephones in the State of California. Therefore, this study focused on the adult population of California. Approximately 95 percent of all California households have a telephone. A random digit telephone sample was purchased from Survey Sampling, Inc. of Westport, Connecticut.

Altogether, 9,983 households were called from 23 May through 6 June 1987. Since the phone numbers were randomly generated, many were not in service, some were nonresidences, and some were not answered. Numbers not answered were called up to two more times at different hours and days before excluding them. Usable interviews were completed with 25.3 percent (2,526) of the households called. This completion rate is at the upper end of the range for general population household telephone surveys (J. Gregg, pers. comm.).

Potential sources of error in the survey included biased question wording, interviewer behavior, external events in the population being surveyed, and inadequate sample selection procedures. These error sources were minimized by pretesting and consultation to reduce question bias, using experienced and well-briefed interviewers in a supervised interviewing facility, conducting the survey in as short a time as feasible (15 days), and using a sample generated by an experienced and reputable source.

## RESULTS

### Demographics of the Respondents

The age distribution of the sample of 2,526 Californians was very similar to that of the census of the U.S. population. As shown in Table 1, the largest age groups

Table 1. Demographic characteristics of the survey respondents.

Characteristic	Number	Percent
<u>Age</u>		
18-24	321	12.8%
25-34	660	26.2%
35-44	557	22.1%
45-54	345	13.7%
55-64	305	12.1%
65 and over	329	13.1%
<u>Sex</u>		
Male	1,222	48.4%
Female	1,304	51.6%
<u>Education Completed</u>		
Grades 1-7	20	0.8%
Grade 8	32	1.3%
Some high school	174	6.9%
High school graduate	685	27.2%
Some college, trade or business school	874	34.7%
4-year college graduate	456	18.1%
Graduate or professional degree	276	11.0%
<u>Annual Household Income</u>		
< \$15,000	303	12.0%
\$15,000 - 29,999	588	23.3%
\$30,000 - 49,999	794	31.4%
\$50,000 or more	636	25.2%
Do not know/No answer	205	8.0%
<u>Ethnicity</u>		
White	2,013	80.0%
Black	131	5.2%
Hispanic	198	7.9%
Asian-Pacific	98	3.9%
Other	75	3.0%
<u>Years of Residence in California</u>		
1 - 2	100	4.0%
3 - 5	105	4.2%
6 - 10	176	7.0%
11 or more	2,142	84.9%

were 25-34 years of age and 35-44 years of age. The gender of the respondents was almost evenly divided. There were 1,222 male (48.4 percent of the sample) and 1,304 female (51.6 percent of the sample) respondents.

Most survey respondents (91.0 percent) had at least completed high school and 29.1 percent held a college degree (Table 1). More than 60 percent had household incomes of \$30,000 or more per year, and only 12.0 percent had incomes of less than \$15,000 annually. Household income levels found in this survey approximate those of recent California market estimates (J. Gregg, pers. comm.).

A total of 80.0 percent of the respondents were white, 7.9 percent were Hispanic, 5.2 percent were black, and 3.9 percent were of Asian-Pacific ethnic origin. The sample under represents minority populations in California. Reasons for this include a slightly lower percent of minority households with telephones, more persons per household in minority populations, and a language barrier, particularly in Hispanic and Asian households.

### Segmentation of Respondents

Segmentation of the sample on the basis of the amount of leisure time spent outdoors and participation in fish and wildlife-related recreation activities is shown in Table 2. Analysis of responses to survey questions by each of these groups revealed certain similarities and differences. First, a larger percentage of nonusers, capital-intensive facility users, organized sports-oriented outdoor recreationists, capital-intensive outdoor recreationists, and nonconsumptive fish and wildlife recreationists were female. In contrast, the mixed and purely consumptive fish and wildlife recreationists were mostly males. Second, a large percentage of nonusers were in the lower income brackets. In contrast, most nonconsumptive users were in the higher income brackets. Third, nonconsumptive users and mixed users had completed more years of education than nonusers and pure consumptive users. Fourth, nonusers appeared to be a much older group than users of fish and wildlife.

### Attitudes Concerning Fish and Wildlife Management

Survey questions designed to determine public attitudes concerning several major fish and wildlife management issues were split formed. Therefore, the sample population for this part of the survey included only 1,267 potential respondents. The number of total respondents for each attitude question described in the following section will vary from this 1,267 figure, however. This is because some respondents did not express an agree or disagree opinion on certain attitude questions, so they were excluded from the data analysis for those questions.

Table 2. Segmentation criteria for the seven consumer groups.

#### Group 1 (Nonusers)

Persons who spend none of their leisure time outdoors and who do not participate in any fish or wildlife-related activities (n = 273 or 10.8% of the sample).

#### Group 2 (Capital-intensive facility users)

Persons who spend none of their leisure time outdoors but who make visits to zoos, aquariums, natural history museums, nature centers or wildlife parks (n = 184 or 7.3% of the sample).

#### Group 3 (Organized sports-oriented outdoor recreationists)

Persons who spend some or most of their leisure time outdoors but do not participate in fish and wildlife-related activities (n = 134 or 5.3% of the sample).

#### Group 4 (Capital-intensive outdoor recreationists)

Persons who spend some or most of their leisure time outdoors but only visit zoos, aquariums, natural history museums, nature centers or wildlife parks (n = 186 or 7.4% of the sample).

#### Group 5 (Nonconsumptive fish and wildlife recreationists)

Persons who spend some or most of their leisure time outdoors and who participate in at least one nonconsumptive fish or wildlife-related activity, but do not fish or hunt (n = 857 or 33.9% of the sample).

#### Group 6 (Mixed fish and wildlife recreationists)

Persons who spend some or most of their leisure time outdoors and who participate in at least one nonconsumptive fish or wildlife-related activity and who fish and/or hunt (n = 820 or 32.5% of the sample).

#### Group 7 (Purely consumptive fish and wildlife recreationists)

Persons who spend some or most of their leisure time outdoors and who do not participate in any nonconsumptive fish and wildlife activities, but fish and/or hunt (n = 72 or 2.9% of the sample).

Overall, 900 (72.3 percent) of the 1,245 respondents who expressed an opinion concerning financial support for fish and wildlife agreed that people who enjoy the state's outdoor resources should contribute financially to preserve the fish and wildlife, even if they do not themselves hunt and fish. When responses by the seven different consumer groups were crosstabulated, no significant differences were found ( $P > 0.05$ ).

Overall, 72.5 percent (869) of the 1,199 respondents who expressed an opinion concerning space for wildlife disagreed with the idea that there will be plenty of space in California for fish and wildlife even with increased housing and industrial development. Crosstabulations by the seven consumer groups revealed that a significantly larger percentage of nonconsumptive fish and wildlife recreationists (group 5) disagreed with the statement than respondents in the other six groups ( $P < 0.05$ ). However, the majority in all seven groups felt that increased development will mean less space for fish and wildlife.

Most (86.1 percent) of the 1,229 respondents who expressed an opinion concerning maintaining wildlife agreed with the idea that fish and wildlife should be maintained even if it means higher prices for the consumer. When responses were crosstabulated by the seven consumer groups, a significant difference ( $P < 0.05$ ) in response patterns was found (Table 3). A larger percentage of the nonconsumptive (group 5) and mixed (group 6) fish and wildlife recreationists agreed with the statement than respondents in the other groups. Purely consumptive fish and wildlife recreationists (group 7), those who

only fish and/or hunt, were clearly not as supportive of maintaining fish and wildlife if it meant higher consumer prices than respondents who engage in nonconsumptive fish and wildlife activities (group 5 and group 6).

#### Fish and Wildlife Recreation Use Patterns

All respondents were asked whether they had made any visits to zoos, aquariums, natural history museums, nature centers or wildlife parks in the past year. A total of 1,718 (68.0 percent of the sample) indicated that they had made one or more visits, while 807 (31.9 percent) indicated that they had not. Of the 1,718 who had made a visit, 1,190 (69.3 percent) said that their visits had been made on more than one or two days during the year.

Of the 2,069 respondents who spend some or most of their leisure time outdoors, 729 (35.2 percent) had photographed wildlife or wildflowers during the past year. Of these 729, 484 (66.4 percent) had spent more than one or two days photographing wildlife or wildflowers. A total of 506 (24.5 percent) had birdwatched. Of these, 373 (73.7 percent) stated that they spent more than one or two days birdwatching during the past year.

A total of 1,041 (50.3 percent) of the 2,069 respondents who spend some or most of their leisure time outdoors indicated that they participated in feeding or attracting birds or other wildlife during the past year. Of the 2,069 outdoor recreationists, 849 (41.0 percent) indicated that they had visited a natural outdoor area to see birds or wildlife during the past year.

Patterns of participation in nonconsumptive fish and wildlife activities by both mixed and non-

Table 3. Opinions of respondents concerning maintenance of fish and wildlife.

Consumer Group	N	Agree	Disagree
Overall Sample	1,267	86.1%	13.9%
Group 1 (Nonusers)	120	83.3%	16.7%
Group 2 (Capital-intensive facility users)	90	83.3%	16.7%
Group 3 (Organized sports-oriented outdoor recreation)	65	80.0%	20.0%
Group 4 (Capital-intensive outdoor recreation)	100	81.0%	19.0%
Group 5 (Nonconsumptive fish/wildlife recreation)	406	89.9%	10.1%
Group 6 (Mixed consumptive fish/wildlife recreation)	414	87.0%	13.0%
Group 7 (Purely consumptive fish/wildlife recreation)	34	73.5%	26.6%

Raw Chi Square = 15.17 with 6 degrees of freedom ( $P = 0.019$ ).

Table 4. Participation in nonconsumptive fish and wildlife-related recreation by mixed and non-consumptive users.

Activity	Group Participation	
	Mixed	Non-consumptive
Birdwatching	24.9%	35.2%
Wildlife photography	42.6%	44.3%
Feeding wildlife	55.9%	68.0%
Visiting wildlife areas	50.5%	50.8%

consumptive users are shown in Table 4. Although use patterns were very similar for the two groups, participation by nonconsumptive users was slightly higher than mixed users.

#### Funding for Fish and Wildlife Programs

All survey respondents in groups 4-7 ( $n = 1,935$ ) were asked a series of questions to determine their willingness to approve five alternative methods of raising funds for maintaining fish and wildlife. The number of total respondents for each funding question described in this section will vary from this 1,935 figure because some respondents did not express an opinion on certain funding questions and were excluded from the data analysis on those questions.

Of the 1,914 respondents who expressed an opinion concerning a \$2 entrance fee to state fish and wildlife areas, 1,614 (84.3 percent) approved of a fee, while only 300 (15.7 percent) disapproved. When those who disapproved were asked if they would approve of a \$1 entrance fee, 141 (47.5 percent) stated that they would. When responses were crosstabulated by consumer groups, no statistically significant differences between response patterns of the groups were found ( $P > 0.05$ ). During the interviews, many survey respondents expressed surprise that a fee is not presently charged at CDFG areas. They also felt that \$2 seemed very low since entrance fees at most recreation sites are well above \$2.

Of the 1,914 respondents who expressed an opinion concerning a \$15 annual conservation pass that would give the purchaser access to any state fish and wildlife area without paying entrance fees, 1,649 (86.2 percent) approved of the concept, while only 265 respondents (13.8 percent) disapproved. When those who disapproved were asked if they would approve of a \$10 annual conservation pass, 74 (28.5 percent) stated that they would. When responses were crosstabulated by consumer groups no statistically significant differences

between response patterns of the groups were found ( $P > 0.05$ ).

Of the 1,907 respondents who expressed an opinion concerning a \$2 additional registration fee for boats and off-road vehicles, such as snowmobiles and trail bikes, as a source of raising funds for maintaining fish and wildlife, 1,595 (83.6 percent) approved while only 312 (16.4 percent) disapproved. When those who disapproved were asked if they would approve of a \$1 additional registration fee, 125 (40.2 percent) stated that they would. When responses were crosstabulated by consumer groups, a significant difference ( $P < 0.05$ ) between response patterns of the groups was found. A significantly larger percentage of purely consumptive fish and wildlife recreationists (group 7) disapproved of the boat and ORV additional registration fee than respondents in the other three groups (Table 5). However, most (71.4 percent) of the respondents in group 7 did indicate that they approved of the \$2 additional registration fee.

Of the 1,918 respondents who expressed an opinion concerning a \$1 additional charge on each motor vehicle registration fee as a source of raising funds for maintaining fish and wildlife, 1,137 (59.3 percent) approved of the fee while 781 respondents (40.7 percent) disapproved. When responses were crosstabulated by consumer groups, no statistically significant differences ( $P > 0.05$ ) between response patterns of the groups were found.

Of the 1,914 respondents who expressed an opinion concerning a special tax on the sale of backpacking, camping and other outdoor sporting equipment as a source of raising funds for maintaining fish and wildlife, only 708 (37.0 percent) approved, while 1206 (63.0 percent) disapproved. When responses were crosstabulated by consumer groups, no significant differences ( $P > 0.05$ ) between response patterns of the groups were found.

#### DISCUSSION

Most survey respondents agreed with the concept of "compensatory equity" in that they felt that persons who benefit from fish and wildlife programs should pay for those programs and that fish and wildlife should be maintained even if it means higher prices for consumers. However, most feel that increased housing and industrial development will mean less space for fish and wildlife in California. From these attitude statements, it appears that most Californians favor the protection of the state's fish and wildlife resources.

This study shows that most Californians (83.9 percent) participate in one or more wildlife-related activities, yet very few (2.9 percent) are pure consumptive users. Therefore, Californians have a lot of interest in

Table 5. Consumer approval (Yes/No) of an additional boat and off-road vehicle registration fee as a funding alternative.

Consumer Group	N	Yes	No
Overall Sample	2,526	83.6%	16.4%
Group 4 (Capital-intensive outdoor recreation)	184	84.8%	15.2%
Group 5 (Nonconsumptive fish/wildlife recreation)	841	86.7%	13.3%
Group 6 (Mixed consumptive fish/wildlife recreation)	812	91.3%	18.7%
Group 7 (Purely consumptive fish/wildlife recreation)	70	71.4%	28.6%

*Raw Chi Square = 16.80 with 3 degrees of freedom (P = 0.001).*

nonconsumptive as well as consumptive uses of wildlife resources. The most popular nonconsumptive activities include visits to zoos and other developed wildlife facilities, birdwatching, and feeding or attracting birds or other wildlife around homes. Visiting natural outdoor areas specifically to see birds or wildlife is also quite popular.

A note of caution is appropriate with respect to the percent of pure consumptive users reported in this study. This percent may underestimate the true proportion of such users in California with respect to the entire population. This is due to the fact that persons under 18 years of age were not sampled in this study and there is some research evidence that younger recreationists are more likely to be purely consumptive users of wildlife (Jackson and Norton 1980). However, this study does accurately reflect consumptive and nonconsumptive use patterns of the adult population.

In addition to expressing strong interests in nonconsumptive uses of wildlife, Californians also indicated that three funding alternatives for nonconsumptive wildlife programs would be acceptable to them. The \$15 conservation pass, the \$2 entrance fee for fish and wildlife areas, and the additional \$2 registration fee for boats and ORVs received strong support from all four fish and wildlife consumer groups. However, there is far less support for a \$1 additional DMV vehicle registration fee, and very little support for a tax on outdoor sporting equipment.

Therefore, the first three funding alternatives should be researched in more depth to determine Californians' willingness to pay for them. This could be done through a contingent valuation study or by implementing one or more of the fees and closely monitoring public response.

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