

Project Report

on research titled

**A SURVEY OF 1997 COLORADO ANGLERS AND
THEIR WILLINGNESS TO PAY INCREASED LICENSE FEES**

Conducted by

USDA Forest Service
Rocky Mountain Research Station
Fort Collins, CO 80526

and

Department of Agricultural and Resource Economics
in association with the
Human Dimensions in Natural Resources Unit
College of Natural Resources
Colorado State University
Fort Collins, CO 80523

In cooperation with

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Executive Summary

The 1997 Colorado Angler Survey was designed to estimate the willingness of Colorado anglers to pay increased fees under various management scenarios. An additional objective was to gain insight as to anglers' satisfaction with fishing and their attitudes toward a variety of angling and funding issues. This report summarizes the findings of the Survey conducted during the winter and spring of 1998.

Sample and Survey Design

The angler survey was cooperatively designed by the Colorado Division of Wildlife, Colorado State University Human Dimensions in Natural Resources Unit, and the U.S. Forest Service Rocky Mountain Research Station. Colorado 1997 resident combination, annual fishing, and annual senior fishing license holders (age 18 or older) were randomly sampled for their 1997 fishing experiences.

The survey was conducted by mail using an introductory letter, three survey mailings, and a reminder postcard. A total of 3,990 surveys were completed and returned; a response rate of 71.4%.

The survey contained four parts. Part One asked questions about fishing characteristics, style, and behaviors-when, where, and how anglers fish. Part Two asked anglers to agree or disagree (on a 5 point scale from Strongly Agree to Strongly Disagree) with 37 statements related to fishing and fishery management. Part Three contained questions about two of four alternative fee increase proposals. Part Four asked several demographic and socioeconomic questions.

Results

The following are condensed highlights of survey responses, by section of the survey. Parts One, Two, and Four are based on analyses of the full sample of 3,990 responses. Part Three results are based on the subsamples that responded to each of the four fee increase alternatives. Each respondent answered questions about two alternatives so the analyses of each alternative are based on approximately 2,000 responses.

Part One -- Profile of Fishing Activity by Colorado Residents in 1997

- The overwhelming majority of anglers (over two-thirds in each license type) prefer to fish for trout. The next most preferred species for all three license types (but only cited by 5% - 8% of anglers) was walleye/saugeye.
- About 75% of anglers prefer cold water fishing, with the majority of those preferring cold water lakes/reservoirs to cold water streams/rivers.
- Over half the anglers of all three license types most often fish in stocked waters (58% of Annual license holders, 67% of Senior license holders, and 55% of Combination license holders). But about 25% of anglers report they do not know whether the water they most often fish is stocked or not.
- About a third of Annual and Combination license holders report releasing most of the fish they catch, while only about 14% of Senior license holders report doing so. Senior license holders are most likely to keep most of the fish they catch (44% vs. 23% of Annual and 22% of Combination license holders).

- Close to 20% of all anglers report frequently fishing at sites they consider crowded. Another 40% “sometimes” fish at sites they consider crowded. Only about 10% report never fishing at sites they consider crowded.
- About 63% of both Annual and Combination license holders report that the level of crowding they feel while fishing at their usual site decreases the enjoyment of their fishing trips, while a majority (52%) of Senior license holders report that level of crowding has no effect on the enjoyment of their fishing trips.
- The number of fishing trips taken to any site in Colorado in 1997 averaged 16 for Annual license holders, 13 for Senior license holders, and 17 for Combination license holders. The median was 10 trips for Annual and Combination license holders and 7 for Seniors.
- Number of days fished in Colorado in 1997 averaged 21 for Annual license holders, 20 for Senior license holders, and 23 for Combination license holders. The medians were 13 days for Annual license holders, 12 for Seniors, and 15 days for Combination license holders. That implies many of the fishing trips by Colorado residents were day trips.
- Annual license holders report the highest level of satisfaction with their 1997 fishing experiences in Colorado with about 47% being strongly satisfied or somewhat satisfied. About 40% of Combination license holders and 38% of Senior license holders report being strongly or somewhat satisfied. A majority of all three license types (61% of Annual license holders, 52% of Seniors, and 55% of Combination license holders) report positive satisfaction (slightly, somewhat, or strongly satisfied) with their 1997 Colorado fishing experiences.

Part Two -- Angler Attitudes Toward Selected Issues

- Overall, and for each type of license, substantially more anglers disagree than agree with the statement that “people who fish for stocked trout are the ones who should pay for the trout stocking program.” (Overall 45% disagree, 28% are neutral, 26% agree)
- A strong majority (78% overall) of anglers agree with the statement that “the cost of providing recreational fishing should be shared equally by all anglers.”

The previous two statements suggest that Colorado anglers are not generally in favor of going to a system in which those who utilize stocked trout would pay more than other anglers.

- About 64% of anglers overall disagree with the statement: “If the trout stocking program cannot pay its way it should be eliminated.” Senior license holders express the strongest disagreement (67%), but over 60% of anglers in each license type disagree.
- While the majority of anglers of all three license types agree with the statement “Bag limits for trout should be lowered if necessary to protect trout populations,” those holding Senior licenses do so with the smallest majority. (75% agreement among Annual license holders, 62% agreement among Seniors, 72% among Combination license holders)
- A smaller majority of anglers of all three license types agree with the statement “Bag limits for trout should be lowered if necessary to protect trout populations, even if that means a limit of two trout per day.” Again, Senior license holders show a smaller majority in agreement than do Annual or Combination license holders. (68% agreement among Annual, 55% among Seniors, and 65% agreement among Combination license holders)

- A strong majority of anglers of all three license types (74% of Annual, 73% of Senior, and 67% of Combination license holders) agree with the statement “Season closures for trout would be OK if they were needed to protect trout populations.”
- More anglers of all three license types disagree than agree with the statement: “I would rather have an increase in license fees than season closures for trout” (46% of Annual license holders, 47% of Seniors, and 44% of Combination license holders disagree, while 31% of Annual, 31% of Senior, and 34% of Combination license holders agree with the statement).
- A majority of Annual (55%) and Combination license holders (53%) disagree with the statement “I would rather have an increase in fishing license fees than a decrease in bag limits for trout.” Senior license holders show just short of a majority (48%) disagreeing with that statement.
- Annual (64%) and Combination license holders (63%) show a strong majority in agreement with the statement “I would rather have a decrease in bag limits for trout than season closures for trout.” Senior license holders show just short of a majority (49%) in agreement with that statement.

The last three statements suggest stricter bag limits are preferred to season closures, and both are preferred to an increase in fees as mechanisms for protecting trout populations.

- More anglers disagree than agree with both the statements:
 - (1) “If bag limits for trout are lowered it would still be OK to increase license fees to pay for the trout stocking program if that is what it takes” (overall about 38% agree and about 44% disagree with this statement) and
 - (2) “If there is a closed season for trout it would still be OK to increase license fees to pay for the trout stocking program if that is what it takes” (overall, about 30% agree and about 49% disagree with this statement).

The smaller disparity between the proportions of anglers agreeing and disagreeing with the first statement than with the second statement suggests it would be more acceptable to combine a fee increase with bag limits for trout than to combine a fee increase with season closures for trout.

Part Three -- Anglers' Willingness to Pay Increased License Fees

Four scenarios were proposed in the survey as options that the Colorado Division of Wildlife (CDOW) might consider to help meet the expenses associated with stocking catchable-size trout:

Proposal 1: Increase license fee for all anglers, while trout stocking is maintained at 1997 level.

Proposal 2: Increase license fee for all anglers, while trout stocking is increased to 25% above 1997 level.

Proposal 3: License fee is unchanged, trout stocking is maintained at 1997 level, but Stocked Trout Water Stamp is required for all anglers who fish for trout in waters where catchable-size trout are stocked, regardless of harvest.

Proposal 4: License fee is unchanged, trout stocking is maintained at 1997 level, but Trout Stamp is required for all anglers who fish for trout in any waters, regardless of whether catchable-size trout are stocked there, and regardless of harvest.

Anglers were each asked about their willingness to pay increased license fees under two of the various proposals in two question formats. The first was a "dichotomous choice" format in which anglers were asked to respond "Yes" or "No" to a specified price under the conditions described in the proposal. The second was an "open-ended" format in which anglers were asked to state the highest license fee they would pay in response to the proposal.

For example, in the first fee alternative, a proposal was described in which license fees would be increased for all anglers while trout stocking would be maintained at 1997 levels. In the dichotomous choice question, anglers were asked whether they would have bought a license if conditions were the same as 1997 and the license fee was \$X. Six fee amounts, \$22.25, \$26.25, \$32.25, \$44.25, \$68.25, \$124.25, were randomly assigned to questionnaires. Each angler was asked to respond yes or no to **one** of those six amounts. The amounts stated were used as fees for Annual licenses. Fee amounts for Senior and Combination licenses were adjusted to maintain the current relationship between license types. Senior license fee increases were always 50% of the Annual license fee increase and Combination license fee increases were always set at 150% of the Annual license fee increase.¹ (1997 fees were \$20.25 for resident Annual licenses, \$10.25 for resident Senior licenses, and \$30.25 for resident Combination licenses.)

For the stamp proposals, anglers were first asked whether they would have bought a fishing license under the stated conditions and current license fee. If they said "Yes" to the fishing license, they were asked whether they would have bought the stamp that was described if it cost \$X--Yes or No?

The yes/no responses were used along with the dollar amounts to estimate a probability distribution function.² That function (which is a mathematical equation) estimates the probability that an angler would be willing to pay any given license fee. For

¹The fee amounts reflect fee increases (for Annual licenses) of \$2, \$6, \$12, \$24, \$48, \$104. Those six fee increase amounts were used for the stamp options. In the stamp options, the same amounts were used for all anglers--there were no distinctions between license types.

²In order to estimate probability distribution functions from the responses to a dichotomous choice question, the fee amounts must cover the full range of values placed on the activity. One needs some low amounts to which almost everyone will respond "yes," some high amounts to which almost everyone will respond "no," and some amounts in between to which there will be a mixture of yes and no responses. Based on several focus groups and a pretest, the six amounts ranging from \$2 to \$104 were selected.

example, one could put a fee of \$26.25 into the equation and calculate the probability than an angler would be willing to pay that license fee. The mean (or average) value, median value (the fee at which 50% of anglers would pay and 50% would not), and other points along the distribution can be calculated to provide different measures of the value placed on a fishing license.

In the open-ended question, which followed the dichotomous choice question on the survey, anglers were asked to write down the most they would have been willing to pay for a 1997 Colorado fishing license under the specified proposal, or for a stamp in the cases of Proposals 3 and 4. Mean, median and other measures of value can be calculated directly from the anglers' responses.

Economic values derived from open-ended questions are generally lower than those derived from dichotomous choice questions. It is thought by some that open-ended values are a more conservative or lower bound estimate of value. It has been suggested that dichotomous choice-based values might be closer to how respondents would actually behave if they were really pushed and faced with the situation described in the valuation scenario, whereas open-ended based values might represent more what a respondent views as a "fair" or "reasonable" price. Those hypotheses are speculations by some economists, but they are worth keeping in mind.

Valuation results for the four fee increase scenarios are summarized in Table A. For each of the fee increase proposals, the table presents results for the dichotomous choice-based question followed by results for the open-ended question. For the dichotomous choice question, the mean, median, 25th percentile, 75th percentile, and 90th percentile are presented. For the open-ended question, the mean, 95% confidence interval around the mean, and median are presented. For both question formats, results are presented by license type--Annual, Senior, Combination. The means, medians, and other measures of value are presented as "**net values.**" That is, they are presented as fee increases or amounts **in addition to** fees already paid.

The mean values shown on the table represent the maximum amounts anglers would be willing to pay, on average, as a fee increase--over and above the fees already paid--by license type. The median values are the fee increase amounts that 50% of anglers would be willing to pay and 50% would not. Also shown are the 25th, 75th, and 90th percentiles. The 25th percentile, for example, is the fee increase amount that 25% of anglers would be willing to pay; the 90th percentile is the amount that 90% of anglers would be willing to pay. Conversely, at the 25th percentile, 75% of anglers would not be willing to pay that amount of fee increase; at the 90th percentile, 10% of anglers would not be willing to pay the amount of the fee increase. The median is the same as the 50th percentile.

The best sense of the value placed on a fishing license can be gained by looking at the entire distribution for the dichotomous choice-based results; and at the mean, confidence interval around the mean, and median for the open-ended-based results. The mean is the most common summary measure of value, but it may or may not be the best in any given instance. Many people advocate the median as a better measure of summary value than the mean because the median eliminates the effect of outliers in the data. For example, if a distribution of values contains a small number of individuals who can and do place very high monetary values on fishing licenses, the mean will be greater than the median because of those high value individuals. Those high values might be true and accurate--those individuals might indeed place very high values on fishing licenses--but they will result in a skewed distribution and mean. The mean will be above the median. If that mean were used as the summary measure of value, the summary measure would be above the amount at which 50% of anglers would no longer buy a fishing license. In the case of a symmetric distribution, the mean and median are equal.

There could be cases where even the median value might be inappropriate. One might have a policy objective to maximize participation in fishing. In such a case, it might be more appropriate to consider the 90th percentile, the value at which 90% of anglers would continue to participate. The point is that economic valuation provides information on how much value people

place on a given activity. One must consider all the information and decide how it fits the objectives of the decision and which information is most relevant to particular circumstances.

- Looking at Proposal 1--dichotomous choice format--on Table A, Annual license holders would be willing to pay an additional \$36.03, on average, in license fees. At the median value, 50% of Annual license holders would be willing to pay an additional \$19.45, but 50% would not buy a fishing license at that increased fee--the number of Annual license holders would be cut in half. If license fees increased by \$3.03, 90% of Annual license holders would pay that increase, but the number of Annual license holders would drop by 10%.
- Looking at Proposal 1--open-ended format--Annual license holders would be willing to pay a fee increase of \$12.94, on average, based on the open-ended question, with a median of \$9.75. Remember, the median corresponds to the 50th percentile. The 95% confidence interval for Annual license holders is \$11.71 to \$14.17--if one were to analyze multiple samples of Annual license holders and ask how much they would be willing to pay in addition to their Annual license fee if the conditions were the same as they were in 1997, the mean value would fall in that interval 95% of the time. Keep in mind that the open-ended values are a conservative estimate of value, they represent more of a lower bound estimate of mean and median value.
- The percentiles shown in the table for the dichotomous choice format can be used to predict how anglers might respond to fee increases under the conditions posed in the proposals. We will illustrate using Proposal 1. The 90th percentile predicts that 90% of Annual license holders would purchase a license, given current conditions of trout stocking, if the fee were increased by \$3.03. Conversely, that means 10% of Annual license holders would drop out if the fee were increased by \$3.03. An increase of \$3.03 is about a 15% fee increase in the current Annual license fee of \$20.25. The fact that sales of regular Annual licenses would fall by 10% if fees increased by 15% means that demand for Annual licenses is not very sensitive to price. It is price inelastic in economic terms (meaning license sales decrease less than proportionately with fee increases).³ CDOW could increase revenue by increasing Annual license fees. Looking at the 75th percentile, a fee increase of \$7.68--a 38% fee increase--would result in a 25% decrease in Annual license sales. Again, demand for resident Annual fishing licenses is price inelastic. At the 50th percentile (or the median), a fee increase of 96% (\$19.45) would result in a 50% loss of resident Annual license sales. We conclude that over any reasonable range of fee increases, demand for resident Annual licenses is price inelastic and CDOW could increase revenue by raising license fees. Similar results are obtained for Senior and Combination licenses. Of course, revenue generation needs to be balanced against angler participation--the revenue information is only one part of the story.
- Based on the dichotomous choice questions, anglers of all license types are willing to pay more for an across the board fee increase than they are willing to pay for a stamp in addition to their license. Compare the means and medians for Proposal 1 with those for Proposals 3 and 4. Proposal 1 has a mean around \$36 and a median around \$19, whereas Proposals 3 and 4 have means around \$20 to \$25 and medians around \$11 for Annual license holders. Similar differences appear for Senior and Combination license holders.
- When one looks at the open-ended format questions for Annual and Senior license holders, the numbers show that same pattern--Annual and Senior license holders are willing to pay more for an across the board fee increase than for a stamp. Combination license holders, however, appear to be willing to pay more for the stamp options than for the across the board fee

³Price elasticity of demand is a measure of response. It measures the percentage change in demand resulting from a percentage change in price. If demand for a good is price elastic, it is relatively sensitive to price and demand falls more than proportionately to an increase in price. Price inelastic demand is relatively insensitive to price and demand falls less than proportionately to an increase in price. If demand for a good is price inelastic, total revenue will increase when price is increased. If demand is price elastic, total revenue will decrease when price is increased.

increase. For all three license types, however, the differences between the open-ended fee increase options and the open-ended stamp options are not statistically significant at the 5% level, as shown by the overlapping confidence intervals.

- Based on the open-ended questions, anglers are not willing to pay a higher fee increase if stocking is increased by 25% than if stocking remains at 1997 levels. Responses to the dichotomous choice questions tell a similar story, but it is less clear cut because the estimated probability distributions intersect and cross. At higher levels of fee increase (illustrated by the 25th percentile), Annual and Combination license holders appear to be willing to pay a little more if stocking levels are not increased (Proposal 1), while at lower levels of fee increases (illustrated by the 75th and 90th percentiles) they appear willing to pay a little more if stocking levels are increased (Proposal 2). The opposite pattern appears for Senior license holders--at higher levels of fee increase, Seniors are willing to pay a little more for increased stocking, while at lower levels of fee increase they are willing to pay a little more for no increase in stocking. The message from Annual and Combination license holders might be characterized as "If you can increase stocking for a small amount of money, go ahead and do it, but if it costs a lot of money, don't bother." The message from Senior license holders might be characterized as "We do not want increased stocking enough to pay higher license fees, but if you raise fees by a lot you'd better give us increased stocking in return." On balance, there does not appear to be a high demand for increased trout stocking.
- Anglers were asked to rank three fee increase alternatives in order of preference. Choice A was an across the board fee increase for all anglers (comparable to Proposal 1), Choices B and C were stamp options (comparable to Proposals 3 and 4, respectively). The across the board fee increase for all anglers was ranked as the most preferred option by 56.8% of all anglers (61.5% of the nonmissing responses). The Stocked Trout Water Stamp was ranked as most preferred by 22.0% of all anglers (23.8% of nonmissing responses), and the Trout Stamp was ranked most preferred by 14.3% (15.5% of nonmissing respondents).
- The two stamp options could be combined and the comparison made between a fee increase and imposition of a stamp. In this comparison, the across the board fee increase still dominates--61.5% of nonmissing responses vs. 39.3% of nonmissing responses. The same pattern emerges if one looks at the preferences by license type, with Senior license holders showing the most support for the across the board fee increase.
- Support for the across the board fee increase alternative is consistent across the different types of questions. In the attitude questions, the majority of anglers thought the cost of providing recreational fishing should be shared equally by all anglers; and a plurality disagreed that the people who fish for stocked trout are the ones who should pay for the trout stocking program. In the willingness to pay questions, anglers appeared willing to pay more when the fee increase was across the board than when it came in the form of a stamp, even though the differences were not statistically significant. Finally, in the preference ranking question, the across the board fee increase was the clearly preferred option.

Part Four -- Demographic and Socioeconomic Characteristics of Anglers

- The majority of anglers are male--80%--with the mean age of Annual license holders being 43 years. The mean ages of Combination and Senior license holders are 45 and 68 years, respectively.
- Combination license holders appear to contain a somewhat larger proportion of rural residents than do the Annual or Senior license categories, as indicated by the average one-way distance to shop for weekly groceries (7 miles for Combination license holders compared to about 5 miles for Annual and Senior license holders).
- Combination license holders show the highest propensity to belong to environmental or sportsman's organizations--about 32%, compared to 15% for Annual license holders and 10% for Seniors.

- The distribution of license holders across ethnic or racial backgrounds is 81% White, 7% Hispanic, 1.4% Native American, 1.3% Black/African American, and 1% Asian or Pacific Islander (about 8% of survey respondents did not respond to this question or gave multiple answers).

Table A. Economic Valuation Results for the Four Fee Increase Proposals

Proposal 1 -- Increase fee, no increase in stocking -- dichotomous choice format

	<u>Mean</u>	<u>Median</u>	<u>25%ile</u>	<u>75%ile</u>	<u>90%ile</u>
Annual License	\$36.03	\$19.45	\$49.28	\$7.68	\$3.03
Senior License	\$29.38	\$16.88	\$40.59	\$7.02	\$2.92
Combination License	\$63.99	\$30.17	\$85.08	\$10.70	\$3.79

Proposal 1 -- Increase fee, no increase in stocking -- open-ended format

	<u>Mean</u>	<u>95% Confidence Interval</u>	<u>Median</u>
Annual License	\$12.94	\$11.71 - \$14.17	\$9.75
Senior License	\$9.03	\$7.23 - \$10.83	\$5.00
Combination License	\$8.88	\$6.53 - \$11.23	\$4.75

Proposal 2 -- Increase fee, 25% increase in stocking -- dichotomous choice format

	<u>Mean</u>	<u>Median</u>	<u>25%ile</u>	<u>75%ile</u>	<u>90%ile</u>
Annual License	\$31.71	\$19.62	\$44.23	\$8.70	\$3.86
Senior License	\$54.81	\$19.09	\$67.05	\$5.43	\$1.55
Combination License	\$46.44	\$26.38	\$64.06	\$10.86	\$4.47

Proposal 2 -- Increase fee, 25% increase in stocking -- open-ended format

	<u>Mean</u>	<u>95% Confidence Interval</u>	<u>Median</u>
Annual License	\$13.49	\$12.14 - \$14.84	\$9.75
Senior License	\$10.46	\$8.17 - \$12.75	\$7.00
Combination License	\$8.36	\$6.11 - \$10.61	\$4.75

Proposal 3 -- Stocked Trout Water Stamp -- dichotomous choice format

	<u>Mean</u>	<u>Median</u>	<u>25%ile</u>	<u>75%ile</u>	<u>90%ile</u>
Annual License	\$20.57	\$10.45	\$27.80	\$3.93	\$1.48
Senior License	\$13.17	\$6.20	\$17.50	\$2.20	\$0.78
Combination License	\$16.06	\$7.73	\$21.46	\$2.78	\$1.00

Proposal 3 -- Stocked Trout Water Stamp -- open-ended format

	<u>Mean</u>	<u>95% Confidence Interval</u>	<u>Median</u>
Annual License	\$11.09	\$10.33 - \$11.85	\$7.00
Senior License	\$6.06	\$4.77 - \$7.35	\$4.00
Combination License	\$10.09	\$8.60 - \$11.58	\$5.00

Table A (continued). Economic Valuation Results for the Four Fee Increase Proposals

Proposal 4 -- Trout Stamp -- dichotomous choice format

	<u>Mean</u>	<u>Median</u>	<u>25%ile</u>	<u>75%ile</u>	<u>90%ile</u>
Annual License	\$25.44	\$11.85	\$33.73	\$4.17	\$1.46
Senior License	\$19.94	\$5.54	\$22.65	\$1.36	\$0.33
Combination License	\$24.77	\$12.22	\$33.27	\$4.49	\$1.65

Proposal 4 -- Trout Stamp -- open-ended format

	<u>Mean</u>	<u>95% Confidence Interval</u>	<u>Median</u>
Annual License	\$11.47	\$10.49 - \$12.45	\$6.00
Senior License	\$7.45	\$5.37 - \$9.53	\$5.00
Combination License	\$11.40	\$9.95 - \$12.85	\$6.00

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INTRODUCTION AND STUDY METHODS

Introduction

Management Situation and Need

The incidence and spread of whirling disease has resulted in the need to spend large sums of money cleaning up whirling disease positive state fish hatcheries, purchasing privately reared fish, and protecting clean state fish hatcheries. Current income will not cover those expenses in addition to other expenses of the statewide fishery management program. The blue-ribbon whirling disease report specifically suggested a willingness to pay study of anglers to assess the feasibility and potential of covering the costs associated with stocking catchable sized trout in the future. The option of eliminating or greatly reducing the stocking program does not appear to be a viable one to the Colorado Division of Wildlife (CDOW). Because current revenues do not cover the total cost of the fishing program when indirect costs are considered, strong consideration is being given to ways of increasing revenue from fishermen. Currently, CDOW does not have any information on the willingness of anglers to accept higher fees.

Study Purpose and Objectives

The purpose of this study was to provide CDOW with information on the willingness of anglers to incur increased license fees under current and altered levels of fish stocking, and under the current license fee structure and a new structure requiring stamps for certain angling opportunities.

Specific objectives of this study were to: (1) collect information about the willingness of anglers to pay increased license fees given current stocking levels, and under altered stocking levels, (2) collect information about the willingness of anglers to pay for a stamp, in addition to current license fees, required for specified fishing opportunities, to fund the stocking program, (3) model the probability that anglers will purchase a license as a function of license fee.

Literature Review and Background Information

The economic literature related to the value of fishing is virtually all tied to the value of specific fishing trips and specific experiences. Some studies, though not a lot, are aimed at estimating the value placed on catching an additional fish (the marginal value). Walsh, Johnson, and McKean (1988) provide a summary review of empirical studies of the net economic value of fishing experiences. Based on the 1991 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Waddington, Boyle, and Cooper (1994) found the net economic value of trout fishing in Colorado to average \$351 per resident angler per year (or \$41 per day of fishing by residents)⁴, with a marginal value (value of catching one additional trout) of \$.71, where resident anglers caught an average of 35 trout per year.

Johnson, Behnke, Harpman, and Walsh (1995) did a study of economic benefits and costs of stocking catchable trout in Colorado. They found that the costs of the stocking program outweighed the benefits, and concluded that (at the time of their study) CDOW was stocking too many trout. Their results were based on studies of anglers on the Cache la Poudre River in Northern Colorado and the Taylor River in central Colorado. Another Colorado-specific study was done by Harris and Bergersen (1985). Rather than attempting to estimate an economic value for fishing, Harris and

⁴Net economic value is a measure, reported in dollar units, of the value or benefit received by anglers from participating in their fishing experience, over and above all cost incurred to participate in those fishing experiences.

Bergersen reported on survey data addressing the issue of (and distinction between) constrained vs. unconstrained demand. Among their results was a finding that nonfishing aspects of the site can influence angler satisfaction considerably, leading to their conclusion that both fishery and other resource managers can shape angler demand for fishing.

The problem posed in this study has a different twist in that the issue is whether anglers will purchase a license under different conditions of fees and stocking levels rather than how anglers value particular kinds of fishing trips and experience. The two are related but not the same. Information from Wisconsin, based on focus groups and anecdotal evidence, indicates factors such as availability and ease of obtaining a license and anglers knowing how license fees are spent by the Agency may be as important as the fee amounts in predicting how anglers will react to an increase in license fees (Petchenik, 1995).

Study Methods

Study Design and a Little Background on Economic Valuation

Four scenarios were proposed as options that CDOW might consider to help meet the revenue shortfall currently being experienced and anticipated in the future:

Proposal 1: Increase license fee for all anglers, while trout stocking is maintained at 1997 level.

Proposal 2: Increase license fee for all anglers, while trout stocking is increased to 25% above 1997 level.

Proposal 3: License fee is unchanged, trout stocking is maintained at 1997 level, but Stocked Trout Water Stamp is required for all anglers who fish for trout in waters where catchable size trout are stocked, regardless of harvest.

Proposal 4: License fee is unchanged, trout stocking is maintained at 1997 level, but Trout Stamp is required for all anglers who fish for trout in any waters, regardless of whether catchable size trout are stocked there, and regardless of harvest.

Proposals 1 and 2 are similar in that both utilize the current structure of fishing license fees. The difference between them is the level of trout stocking. In both cases, additional financial burden is imposed on all anglers, whether they directly benefit from the trout stocking program or not.

Proposals 3 and 4 are similar in that both represent a change to the current structure of fishing license fees--introduction of a stamp required of a particular group of users, thereby imposing additional financial burden specifically on those who benefit from a particular program. The difference between Proposals 3 and 4 is the group of whom the stamp is required. The Stocked Trout Water Stamp (Proposal 3) imposes additional financial burden on anglers who fish for trout in waters where catchable size trout are stocked--the group who most directly and most substantially benefits from the trout stocking program. The Trout Stamp (Proposal 4) imposes additional financial burden on all anglers who fish for trout, stocked or not, in any type of water--a broader group, some of whom benefit less directly from the trout stocking program, some of whom possibly benefit not at all from the trout stocking program.

Each proposal was put into a "valuation scenario" and respondents were asked to value the scenario by responding to a question about their willingness to purchase a fishing license under the conditions posed in the scenario. That is referred to as

the “valuation question.” Valuation questions are described below, and the text of both the valuation scenarios and questions can be seen in the questionnaires included in Appendices 2 and 3.

In order to avoid overburdening respondents by asking them to consider all four proposals, it was decided to ask each respondent to consider two proposals. There are six possible pairings of the four proposals--1 with 2, 1 with 3, 1 with 4, 2 with 3, 2 with 4, and 3 with 4. Each pairing was then split and half the respondents in each pairing were asked to consider the proposals in reverse order. For example, half the respondents in the 1 with 2 pairing were asked to consider Proposal 1 followed by Proposal 2 and the other half were asked to consider Proposal 2 followed by Proposal 1. The result was 12 groups as shown in Table 1.

The purpose of this design and group structure was twofold. One purpose was to control for order effects on responses to the valuation questions, i.e., do responses to the first proposal presented in a given survey affect responses to the second proposal presented? Order effects are unrelated to the specifics of the proposals being valued. The only issue is whether there are systematic differences in values assigned to a given proposal based on the order in which the proposals are presented--whether it is encountered first or second as respondents work through the questionnaire. For each pair of proposals in this study, the subsample was split--half were asked to respond to Proposal A followed by Proposal B, the other half were asked to respond to Proposal B followed by Proposal A. Thus, any order effects that might occur are randomized, in effect controlling any bias that might be introduced.

The second purpose was to control for effects of one proposal on responses to another proposal. The suggestion is that when more than one valuation scenario is presented in a questionnaire, responses to the multiple scenarios are not independent (discussed by Poe et al. 1997). For example, does one get a different value for Proposal 1 when it is paired with Proposal 2 than when it is paired with Proposal 4? One hypothesis might be that such effects are stronger and more significant (thereby posing more of a problem in interpreting the results) when scenarios are similar than when they are dissimilar. Distinct from the order effect discussed above, this “similar scenario” effect relates to whether there are systematic differences in values assigned to a given proposal based on the specific proposal it is paired with in the questionnaire.

In this study, Proposals 1 and 2 are similar in that both utilize the current structure of fishing license fees. The difference between them is the level of trout stocking. Likewise, Proposals 3 and 4 are similar in that both represent changes to the current structure of fishing license fees--introduction of a stamp required of a particular group of users. The difference between Proposals 3 and 4 is the group of whom the stamp is required. Because Proposals 1 and 2 are more closely related to each other than to Proposals 3 and 4, and similarly Proposals 3 and 4 are more closely related to each other than to Proposals 1 and 2, the significance and strength of any correlations between responses received to the various proposals are randomized by utilizing all combinations of proposals.

The fee increase proposals were valued using contingent valuation (CV). CV is a method in which a good or change in a good is described to a respondent who is then asked how much he or she would be willing to pay for the good or whether he or she would pay a specified amount for the good. It is a direct revelation of value as opposed to an indirect revelation of value (which might be obtained from observations of market purchases of related goods and services). Two CV question formats, i.e., two types of valuation questions, were used in this study: dichotomous choice and open-ended. A dichotomous choice format is one in which a respondent answers yes or no to a question asking whether he or she would pay a specified amount for a good. That specified amount is referred to as the “offer amount.” An open-ended format is one in which the valuation question asks respondents to fill in the maximum amount he or she would pay for the good specified.

When a dichotomous choice question format is used, a probability distribution is estimated from the yes/no responses to the various offer amounts. In order to estimate such a function, one must obtain data on the full range of possible values that people might have for the good or service being valued. To do that, one must have some offer amounts to which almost

everyone would respond “YES” and some offer amounts to which almost everyone would respond “NO,” along with some intermediate amounts. Those amounts were determined for this study using focus groups and a pretest of the questionnaire. They are discussed in the section on Focus Groups and Pretest.

Study Population and Sampling

The study population was Colorado residents (age 18 or older) who bought annual fishing licenses, annual senior fishing licenses, or combination fishing and small game hunting licenses in 1997. A random sample of that population was drawn from the CDOW license files. The initial sample (consisting of 8,209 anglers) contained regular Annual license holders, Senior license holders, and Combination license holders; each group occurring in the proportions they represented in the population of 1996 resident license holders--74% regular Annual license holders, 6% Senior license holders, 20% Combination license holders. The sample was drawn the end of August 1997, so the true 1997 proportions were not known. The proportions of license types were assumed to remain relatively constant between 1996 and 1997. That assumption turned out to be relatively good. License sales in 1997 included: 327,615 regular Annual licenses (76%), 22,450 Senior licenses (5%), and 82,444 Combination licenses (19%). That initial sample was surveyed to obtain data for the study. Returns and the final sample are discussed below in the Data Collection section.

Survey Instrument

Using a team approach, the design and content of the survey were developed over several months by a study team composed of representatives of the three involved agencies.

The questionnaire contained four parts. Part One asked questions about fishing characteristics, style, and behaviors--what do anglers fish for, how do they fish, how much do they fish, etc. It also contained questions specifically about the anglers' 1997 fishing experiences in Colorado. Part Two asked anglers to agree or disagree with 37 statements related to fishing and fishing management. Part Three contained two of the four possible economic valuation scenarios designed to explore anglers' willingness to incur an increase in license fees in alternative forms. It also queried anglers as to their preferences for forms that a fee increase might take by asking them to rank order three alternatives. Part Four asked several demographic and socioeconomic questions. Parts One, Two, and Four were identical in all versions of the survey. Part Three varied by group, as indicated in Table 1.

Besides obtaining the basic information, a primary reason for including Parts One and Two, and including them before the Valuation questions in Part Three, was to get respondents really thinking about fishing--how they fish, where they fish, how much they fish--and have them think about some issues, controversies, and tradeoffs related to fishing. The intent was to bring as much of the total fishing experience and related management issues to their minds as possible to prepare respondents for the valuation questions. Appendix 2 contains the complete survey for Group 1 which valued Proposals 1 and 2, in that order. Appendix 3 contains Part Three for Group 11 which valued Proposals 3 and 4, in that order.

The questionnaire for this study ranged from 18 to 20 pages, depending on the valuation scenarios being posed in a given version. Respondents were asked to value two of the four proposals by answering a dichotomous choice question and an open-ended question about each proposal.

Linkages to Previous Surveys. The Colorado Division of Wildlife has been involved in a number of surveys over the years on a variety of topics. Information has been collected about Colorado anglers in several of those surveys (e.g., Standage, Inc. 1994, Pate and Manfredo 1997). Each survey had a different focus, and collected somewhat different

information. It would be useful to have a mechanism by which information from those different surveys could be linked and combined to provide additional insights and answer other questions than those addressed by the original surveys. For example, one survey might provide detailed information about what makes particular sites attractive or unattractive to anglers. A second survey might provide information about how anglers would respond to changes in regulations at specific areas. If data from those two surveys could be combined, one could analyze how regulations and site characteristics interact to influence the demand for particular sites.

Links between surveys are provided by questions common to the various surveys. Among those common questions are some of the basic fishing style and preferences asked in Part One of the questionnaire: How much do you fish?, What species do you prefer to fish for?, What kind of water do you fish?, etc. Those kinds of questions allow links to be established based on types of fishing and fishing style. They allow anglers to be grouped along one dimension--fishing behavior. Another set of links can be established based on personal characteristics that can define commonalities between groups of people. Examples might be such things as: Do male anglers behave differently than female anglers? Do anglers with children under age 18 behave differently than anglers without children? Would a particular policy decision affect one group of anglers differently than another group? Those kinds of questions allow anglers to be grouped along another dimension--a socioeconomic dimension. That dimension is the subject of Part Four of the questionnaire. Having more dimensions along which to group people provides a more complete context and allows information from different sources to be combined for more realistic analyses of how different aspects of resource management affect particular groups of resource users.

Focus Groups and Pretest

Four focus groups were conducted to aid in the process of questionnaire development. Each focus group consisted of about ten anglers drawn from a random sample of 1996 annual fishing license holders--the 1996 version of the population used for the study. For convenience, all focus groups were held in Fort Collins over a two week period in mid-August 1997. Three were at a local hotel and conference facility, and one was at Colorado State University. All participants lived in the general Fort Collins-Loveland area. The focus groups ran for two hours each, and during the various groups anglers were presented with draft introductory and cover letters, draft Question & Answer sheets,⁵ and parts of the questionnaire. Participants were asked to respond as if they had actually received the material in the mail. After allowing time for participants to read over the material and respond to draft questions, the focus group leader asked questions and led discussion about what participants thought about the material they were presented. Questions related to such things as: Were materials clear and understandable? Were letters worded in such a way that they conveyed the importance of the study? Would the introductory letter spark their interest and cause them to look for the survey in the mail? Would the survey cover letter compel them to respond to the survey? Did the Question & Answer sheet address relevant questions? Did they have questions that were not addressed on the sheet? Did the survey questions ask for information that conveyed how respondents fished? How easy was it to answer the questions? Could the question have been worded differently to make it more clear? Were there other questions that should be asked? Feedback from the focus groups was analyzed and changes were made to the materials after each group.

After the final focus group, a revised questionnaire draft was mailed (on August 28, 1997) to a random sample of 650 Colorado anglers as a pretest. Half the sample received Proposals 1 and 2. The other half received Proposals 3 and 4. Only one mailing was used; the response rate was about 38 percent. Those data were analyzed with two goals in mind. One was a final opportunity to detect any questions for which responses indicated respondents misunderstood the question or had trouble answering. The second goal was to obtain preliminary estimates of value (or willingness to pay) for each funding proposal to provide information with which to set the "offer amounts" for the dichotomous choice questions in the final questionnaire.

⁵The introductory letter, cover letters, and Question & Answer sheet were included in the mailings used to collect data. They are described under "Data Collection and Response Rates."

Based on the focus groups and pretest, six offer amounts were chosen for the dichotomous choice questions. The amounts were: \$2, \$6, \$12, \$24, \$48, \$104. Those offer amounts were used as stamp prices in the two stamp scenarios (Proposals 3 and 4). Anglers were asked whether they would buy the proposed stamp, in addition to their annual license, at the specified price under the conditions posed. Those same offer amounts were added to the regular Annual license fee in the two license fee increase scenarios (Proposals 1 and 2). Anglers answering those questions were asked whether they would pay the designated amount for a license under the conditions posed. The Senior license fee was always set at half the regular Annual fee and the Combination license fee was always set at 1.5 times the regular Annual fee to maintain the current relationship between the fees. Stamp prices were the same for all license types.

Data Collection and Response Rates

Each selected angler was sent an introductory letter (about November 13, 1997) telling them they had been selected, a little bit about the study, and to expect the survey in about a week and a half. Following that letter, a survey packet was sent (the week of November 24, 1997) to each angler whose introductory letter had not been returned by the Post Office as undeliverable. The packet consisted of a cover letter explaining a little more about the study and that it was important for every selected angler to respond, a page of Questions and Answers about the study, a survey booklet, and a postage paid return envelope. About two weeks after the first survey mailing (about December 11, 1997), a reminder postcard was sent to all anglers who were sent the survey packet. The card thanked those who had already filled out and returned the survey, and reminded those who had not that their response was very important and we really needed to hear from them. Following the reminder postcard, two follow-up survey packets were sent (the weeks of January 19 and March 9, 1998) to nonrespondents. All mailings were sent as first class mail. The introductory letter, three survey cover letters, Question and Answer sheet, and reminder postcard are included as Appendix 1.

The initial sample consisted of 8,209 anglers, randomly split into 12 groups (Table 1). There were 684 anglers in 11 of the groups and 685 in Group 8. Of the 8,209 introductory letters sent to those anglers, a total of 2,621(32%) were returned by the Post Office as undeliverable. A total of 3,990 completed surveys were returned--an overall response rate of 71.4%. Table 2 shows the response rates by group, which ranged from 66.5% to 76.8%.⁶ The 71% overall response, combined with the distributions seen in the demographic data, led to a decision not to do a phone follow-up of nonrespondents to check for nonresponse bias.

The final sample (consisting of the 3,990 returned questionnaires) contained 2,579 (64.6%) Annual license holders, 329 (8.2%) Senior license holders, and 1,082 (27.1%) Combination license holders. Based on the 1997 license sales noted in the Study Population and Sampling section, this constitutes a 0.8% sample of Annual license holders, 1.5% sample of Senior license holders, and 1.3% sample of Combination license holders.

The 1997 Angler Study responses contain an oversample of Senior and Combination license holders. As a result, simply adding up the three subsamples does not result in a representative sample of all resident annual license holders. It is not possible to make the 1997 Angler sample representative of all Colorado resident anglers because the original sampling plan did not consider other types of fishing licenses--daily and multiple day licenses, etc. For this reason, the focus of the study is on the three types of licenses sampled and no attempt was made to weight the data to represent all resident annual license holders. If one is interested in representing all resident annual license holders, the percentages shown in the results section for the

⁶Table 2 shows the numbers (by group) in the initial survey mailing, undeliverables received after that initial survey mailing, and completed surveys returned. It does not show the undeliverables received between the mailing of the introductory letter and the initial survey mailing (which totaled 912). Undeliverable introductory letters were still being returned by the Post Office well after the first survey mailing was sent out. Hence, the additional undeliverables shown on Table 2.

various survey questions for each license type can be multiplied by the proportions in which those license types occur in the population, i.e., 76% regular Annual licenses, 5% Senior licenses, and 19% Combination licenses, then summed to obtain a weighted average.

Completed questionnaires were returned to Colorado State University, where the data were entered into computer readable files and checked for accuracy. Virtually all returned surveys contained usable responses. A few respondents answered few or no questions, but provided comments. The comments were retained and the rest of the survey was coded as missing data. In many returns, there were a few missing responses to various questions, but there were no questions for which large proportions of responses are missing.

Data Analysis

Data analyses were led by Rocky Mountain Research Station personnel with collaboration from Colorado State University.

Analyses of data from Parts One, Two, and Four of the questionnaire consisted of obtaining and examining frequency distributions of the responses to the various questions, and were done using the SPSS for Windows Version 6.1 statistical package (Norusis 1994). Analyses of the data from Part Three of the questionnaire, the economic valuation section, consisted of: (1) Estimating probability distribution functions based on the responses to the dichotomous choice questions, and calculating mean, median, and several percentile points from those distributions. (2) Estimating mean, median, and confidence intervals based on the open-ended questions. (3) Examining frequency distributions of angler preferences for alternative fee increase mechanisms. Those were done using the LIMDEP Econometric Software Version 6.0 (Greene 1992) and SPSS for Windows.

Results are presented in four succeeding parts of this report. In Results - Parts 1, 2, and 4, the survey questions are presented along with the tabulated results and a statement highlighting notable results or implications. Results - Part 3, the economic valuation section, summarizes the estimated distributions of values derived from the survey responses and discusses some implications of those results. It also summarizes angler preferences for the alternative forms that a fee increase might take. All survey materials are presented in Appendices 1, 2, and 3 as noted in preceding sections.

TABLE 1. GROUP STRUCTURE OF 1997 COLORADO ANGLER STUDY

Group 1, (Version 12): Proposal 1 followed by Proposal 2.

Group 2, (Version 21): Proposal 2 followed by Proposal 1.

Group 3, (Version 13): Proposal 1 followed by Proposal 3.

Group 4, (Version 31): Proposal 3 followed by Proposal 1.

Group 5, (Version 14): Proposal 1 followed by Proposal 4.

Group 6, (Version 41): Proposal 4 followed by Proposal 1.

Group 7, (Version 23): Proposal 2 followed by Proposal 3.

Group 8, (Version 32): Proposal 3 followed by Proposal 2.

Group 9, (Version 24): Proposal 2 followed by Proposal 4.

Group 10 (Version 42): Proposal 4 followed by Proposal 2.

Group 11, (Version 34): Proposal 3 followed by Proposal 4.

Group 12, (Version 43): Proposal 4 followed by Proposal 3.

TABLE 2. SURVEY MAILING, RETURN, AND RESPONSE RATE SUMMARY

<u>Group</u>	<u>Number in Initial Survey Mailing</u>	<u>Additional Undeliverable</u>	<u>Number of Completed Surveys Returned</u>	<u>Response Rate</u>
1	604	144	329	71.5%
2	604	138	358	76.8%
3	617	140	317	66.5%
4	603	137	333	71.5%
5	618	141	345	72.3%
6	607	145	352	76.2%
7	618	139	329	68.7%
8	588	161	327	76.6%
9	613	143	331	70.4%
10	613	136	331	69.4%
11	604	146	307	67.0%
12	608	139	331	70.6%
TOTAL	7,297 ^a	1,709	3,990	71.4%

^a 8,209 introductory letters were sent out; 912 of those letters were returned by the Post Office as undeliverable before the initial survey mailing. Hence, the initial survey mailing went to 7,297 individuals. Subsequent to the initial survey mailing, letters to an additional 1,709 individuals were returned as undeliverable, making the total undeliverables 2,621 (912 + 1,709).

RESULTS - PART 1. PROFILE OF FISHING CHARACTERISTICS, STYLES, AND ACTIVITY OF COLORADO ANGLERS IN 1997

In order to compare the fishing preferences and activities of Colorado resident anglers in 1997 to previous information, a specific set of questions was asked of respondents. Such comparative information is necessary for long-term monitoring of changes in angler preferences, use of waters, and frequency of angling. Additionally, as discussed under Study Methods, it provides the basis for combining and comparing different surveys along dimensions of fishing style or level of fishing activity.

Questions in this Part queried: preferences for fishing location and kinds of fishing, experiences with crowding, preferred sites, numbers of fishing trips and days in 1997, and levels of satisfaction with 1997 Colorado fishing experiences. Results in this Part are based on the entire sample of Colorado anglers, numbering 3,990. Of those 3,990 responses, 2,579 (64.6%) are Annual license holders, 329 (8.2%) are Senior license holders, and 1,082 (27.1%) are Combination license holders.

The results in Part 1 are presented in four tables organized by topics: (1) Angler Motivation and Frequency of License Purchase, (2) General Fishing Style and Preferences, (3) Anglers' Experience and Response to Crowding, and (4) Angler Trips, Days, and Satisfaction With Colorado Fishing in 1997. In each table, the questions asked on the survey are presented along with tabulations of the responses. For many of the questions, following the tabulation, a "Highlight" is included summarizing the results or pointing out an item of particular interest. For those questions that are very straightforward, no Highlight is included.

Following Table 6 is a map of Colorado that gives an indication of the level of fishing activity by county. The map is based on the question that asked anglers to list "the three sites in Colorado that you fished the most in 1997 and about how many days you fished there in 1997." They were also asked to identify "the nearest town so we can get a better idea where you fished." Sites and numbers of trips were tabulated and located in counties based on zip code of the nearest town. The result was a number of trips for each county. Those are shown on the map in six groupings. Darker shading indicates **fewer** trips, so the most trips occurred in counties shown completely in white.

The map (Figure 1) does not represent a complete accounting of instate fishing trips by Colorado residents. As noted earlier, only regular Annual, Senior, and Combination license holders were included in the sample. Further, respondents were asked to list only three sites. About half the anglers in the sample fished more than three sites in 1997 (as shown in Table 6), but the sites identified were the sites anglers fished most. Sites identified in the survey, then, should account for somewhat more than half the fishing trips taken by the sample. The map is useful in providing a relative comparison of the level of fishing activity by county even though the absolute numbers of trips have little meaning.

The best use of the tables, and the information from the survey, can be obtained by studying and thinking about the responses to each question. The Highlights are meant to emphasize key points, they are not meant to completely summarize the information.

TABLE 3. ANGLER MOTIVATION AND FREQUENCY OF LICENSE PURCHASE

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
WHY DID YOU BUY A 1997 COLORADO FISHING LICENSE? (CIRCLE ALL THAT APPLY)				
TO GO FISHING EITHER BY MYSELF OR WITH OTHERS	98.5%	98.9%	98.4%	97.6%
TO SUPPORT FISHING IN COLORADO	2.2%	1.4%	4.1%	3.3%
TO SUPPORT SEARCH & RESCUE	8.9%	8.7%	6.0%	10.1%
SOME OTHER REASON	4.2%	3.6%	3.8%	5.8%

Highlights: As expected, virtually all license holders buy a fishing license to go fishing themselves. But a number of individuals cite support for search and rescue operations as a reason contributing to their decision to purchase a license.

**HOW OFTEN DO YOU BUY A
COLORADO FISHING LICENSE?**

EVERY YEAR	81.9%	78.0%	80.9%	91.4%
MOST YEARS	10.6%	12.7%	10.9%	5.6%
ABOUT HALF THE TIME	1.4%	1.6%	1.2%	.8%
SOMETIMES	1.6%	2.0%	1.8%	.7%
ONCE IN A WHILE	1.2%	1.5%	1.8%	.4%
THIS IS THE FIRST	2.6%	3.6%	1.5%	.5%
MISSING	.7%	.6%	1.8%	.6%

Highlights: Over 90% of anglers in all three license types buy a Colorado fishing license every year or most years, with Combination license holders having the highest percentage at 97%.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 4. GENERAL FISHING STYLE AND PREFERENCES

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
HOW OLD WERE YOU WHEN YOU FIRST WENT FISHING?				
PRESCHOOL (UNDER 5)	22.6%	22.1%	6.1%	29.0%
ELEMENTARY SCHOOL (5-11)	62.0%	62.9%	52.6%	62.8%
JUNIOR HIGH AGE (12-13)	4.2%	3.9%	8.2%	3.8%
HIGH SCHOOL AGE (14-17)	2.8%	2.6%	9.7%	1.0%
ADULT (18 OR OVER)	6.8%	7.2%	19.1%	2.0%
MISSING	1.6%	1.4%	4.3%	1.3%
SUMMARY				
Mean.....	8.07	8.25	12.96	6.20
Std. Err. Mean.....	.11	.14	.62	.13
Median.....	6.00	6.00	10.00	5.00
Std. Deviation.....	7.19	7.30	11.02	4.13
Nonmissing Cases.....	3926.00	2543.00	315.00	1068.00

Highlights: Anglers in all three license types started fishing at a relatively early age--about 8 years old for annual license holders, 13 for senior license holders, and 6 for combination license holders (medians of 6, 10, and 5, respectively). Senior license holders were the most likely to start fishing as adults (19% were 18 or older when they started).

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 4 (continued). GENERAL FISHING STYLE AND PREFERENCES

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
HOW LONG HAVE YOU BEEN FISHING IN COLORADO?				
1 YEAR OR LESS	2.9%	3.9%	1.2%	1.1%
2 TO 5 YEARS	11.8%	14.6%	7.3%	6.7%
6 TO 10 YEARS	8.4%	9.5%	5.5%	6.7%
11 TO 15 YEARS	7.8%	8.6%	1.5%	7.8%
16 TO 20 YEARS	12.5%	13.3%	4.3%	13.1%
21 TO 25 YEARS	9.3%	10.0%	4.9%	9.1%
26 TO 35 YEARS	20.4%	19.9%	17.0%	22.6%
36 TO 50 YEARS	19.9%	16.5%	27.7%	25.7%
OVER 50 YEARS	5.8%	2.9%	27.4%	6.2%
MISSING	1.2%	.9%	3.3%	1.0%
SUMMARY				
Mean.....	24.98	22.17	37.58	27.95
Std. Err. Mean.....	.25	.29	1.04	.45
Median.....	25.00	20.00	40.00	28.00
Std. Deviation.....	15.73	14.72	18.61	14.72
Nonmissing Cases.....	3944.00	2555.00	318.00	1071.00

Highlights: Anglers in all three license types have fished in Colorado for a long time. Both the mean and median are 20 years or more for each type. Annual license holders are most likely to have fished in Colorado for a shorter time (18.5% have fished in Colorado for 5 years or less).

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 4 (continued). GENERAL FISHING STYLE AND PREFERENCES

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
WHO DO YOU USUALLY GO FISHING WITH IN COLORADO?				
BY MYSELF	13.9%	14.3%	12.8%	13.4%
FRIENDS OR FAMILY, AND WE ALL FISH	57.7%	57.7%	57.4%	57.9%
FRIENDS OR FAMILY, BUT NOT ALL ACTUALLY FISH	25.3%	24.9%	23.4%	26.6%
OTHER	1.7%	1.8%	2.4%	1.1%
MISSING	1.4%	1.2%	4.0%	1.0%

Highlights: Close to 60% of anglers in all three license types fish with groups of friends or family in which all members fish. About 13% to 14% of anglers in all three license types report they usually fish by themselves.

**WHAT ONE KIND OF FISH DO YOU
PREFER TO FISH FOR MOST OFTEN
IN COLORADO?**

TROUT	71.1%	72.7%	66.3%	68.8%
BASS	3.7%	3.9%	3.0%	3.5%
CATFISH	2.2%	2.0%	2.7%	2.4%
WIPER/WHITE BASS	1.8%	1.5%	1.2%	2.9%
SALMON	2.1%	1.8%	4.9%	1.8%
WALLEYE/SAUGEYE	5.6%	4.7%	5.5%	7.8%
CRAPPIE	1.4%	1.4%	1.8%	1.4%
NORTHERN PIKE/TIGER MUSKIE	1.3%	1.2%	.3%	1.8%
OTHER	1.4%	1.5%	.3%	1.6%
MULTIPLE SPECIES	8.5%	8.8%	11.6%	6.8%
MISSING	1.0%	6%	2.4%	1.3%

Highlights: The overwhelming majority of anglers (over two-thirds in each license type) prefer to fish for trout. The next most preferred species for all license types (but only cited by 5% to 8% of anglers) was walleye/saugeye.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 4 (continued). GENERAL FISHING STYLE AND PREFERENCES

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>WHAT ONE TYPE OF WATER DO YOU MOST OFTEN FISH IN COLORADO?</i>				
COLD LAKES/RESERVOIRS	47.6%	49.1%	53.8%	42.2%
COLD STREAMS/RIVERS	28.7%	28.8%	18.2%	31.8%
WARM LAKES/RESERVOIRS	16.1%	15.4%	16.4%	17.7%
PRIVATE WATERS	1.4%	1.0%	1.2%	2.4%
COMMERCIAL LAKES OR PONDS	.4%	.3%	.3%	.4%
MULTIPLE TYPES	4.8%	4.7%	7.3%	4.2%
MISSING	1.0%	.6%	2.7%	1.4%

Highlights: About 75% of anglers prefer cold water fishing in Colorado, with the majority of those preferring cold water lakes/reservoirs to cold water streams/rivers.

**IS THE WATER YOU MOST OFTEN
FISH IN COLORADO STOCKED?**

NO	16.6%	15.9%	8.5%	20.7%
YES	58.0%	58.1%	66.9%	55.0%
DO NOT KNOW	24.0%	25.0%	22.2%	22.4%
MISSING	1.4%	1.0%	2.4%	1.9%

Highlights: Over half the anglers in all three license types most often fish in stocked waters. But over 20% in each license type report they do not know whether the water they most often fish is stocked or not.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 4 (continued). GENERAL FISHING STYLE AND PREFERENCES

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>IN COLORADO, DO YOU MOST OFTEN FISH...</i>				
FROM THE SHORE OR BANK	53.9%	56.7%	58.1%	45.8%
BY WADING	17.7%	17.3%	11.6%	20.6%
FROM A BOAT, TUBE OR RAFT	23.4%	21.1%	24.6%	28.3%
OTHER	1.7%	1.7%	.0%	2.0%
MULTIPLE STYLES	2.5%	2.5%	3.6%	2.3%
MISSING	.9%	.7%	2.1%	.9%

Highlights: Fishing from the shore or bank is the most common way to fish for all three license types. Combination license holders are more likely to fish by wading or from a boat, tube, or raft than are other license types.

**IN COLORADO, DO YOU MOST
OFTEN FISH WITH...**

ARTIFICIAL FLIES ONLY	13.1%	13.4%	8.2%	14.0%
ARTIFICIAL LURES ONLY	4.2%	4.3%	4.9%	3.6%
FLIES & LURES	12.2%	11.7%	10.3%	14.0%
BAIT ONLY	7.5%	8.6%	13.1%	3.3%
BAIT & LURES	31.3%	32.6%	35.3%	27.0%
FLIES, LURES, BAIT	30.9%	28.8%	26.1%	37.2%
MISSING	.8%	.6%	2.1%	.9%

Highlights: Anglers in the three license types are pretty similar as to their use of flies, lures, and bait. The main differences are that Senior license holders are more likely to use only bait and less likely to use only flies than are Annual or Combination license holders; and Combination license holders are more likely to use all three (flies, lures, and bait) than are Annual or Senior license holders.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 4 (continued). GENERAL FISHING STYLE AND PREFERENCES

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>DO YOU KEEP THE FISH YOU CATCH IN COLORADO OR RELEASE THEM?</i>				
MOSTLY KEEP WHAT I CATCH	24.3%	22.9%	43.8%	21.8%
MOSTLY CATCH & RELEASE	33.0%	35.8%	14.3%	32.3%
KEEP SOME, RELEASE SOME	41.5%	40.4%	38.6%	44.9%
MISSING	1.2%	1.0%	3.3%	1.0%

Highlights: About a third of Annual and Combination license holders report releasing most of the fish they catch, while only about 14% of Senior license holders report doing so. Senior license holders are most likely to keep most of the fish they catch (44% vs. 23% of Annual license holders and 22% of Combination license holders).

**DO YOU HIKE OR BACKPACK TO
GET TO YOUR FISHING SITE?**

FREQUENTLY	9.2%	9.5%	3.3%	10.3%
SOMETIMES	26.8%	26.1%	14.9%	32.2%
ONCE IN A WHILE	39.0%	39.7%	30.4%	40.0%
NEVER	24.2%	24.2%	49.2%	16.5%
MISSING	.8%	.5%	2.1%	1.0%

Highlights: Combination license holders are most likely to hike or backpack to get to their fishing sites (42.5% report frequently or sometimes doing so). Senior license holders are least likely to hike or backpack to get to their fishing sites (18% report hiking or backpacking to their site frequently or sometimes and 49% say they never do).

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 4 (continued). GENERAL FISHING STYLE AND PREFERENCES

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
DO YOU ICEFISH?				
NO	70.9%	75.6%	83.0%	55.8%
YES	28.4%	23.8%	15.2%	43.5%
MISSING	.7%	.6%	1.8%	.6%
DO YOU REGULARLY FISH IN OTHER STATES BESIDES COLORADO?				
NO	74.5%	76.1%	76.0%	70.1%
YES	24.9%	23.4%	21.9%	29.2%
MISSING	.7%	.5%	2.1%	.6%

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 5. ANGLERS' EXPERIENCE AND RESPONSE TO CROWDING

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>DO YOU FISH AT SITES IN COLORADO THAT YOU CONSIDER CROWDED?</i>				
FREQUENTLY	18.8%	18.0%	19.8%	20.4%
SOMETIMES	42.1%	42.4%	38.6%	42.5%
ONCE IN A WHILE	28.0%	28.4%	28.3%	27.2%
NEVER	10.2%	10.5%	10.9%	9.0%
MISSING	.9%	.7%	2.4%	.9%

Highlights: Close to 20% of anglers in all three license types

report frequently fishing at sites they consider crowded.
Another 40% "sometimes" fish at sites they consider crowded.
Only about 10% of anglers in all three license types report
never fishing at sites they consider crowded.

***ON A SCALE OF 1 TO 7...
IN THE AREA YOU FISH MOST IN
COLORADO, HOW CROWDED DO YOU
FEEL WHILE YOU ARE FISHING?***

1 - NOT AT ALL CROWDED	11.1%	10.4%	15.5%	11.5%
2	12.9%	12.8%	13.7%	12.8%
3 - SLIGHTLY CROWDED	25.7%	25.8%	26.4%	25.0%
4	14.1%	15.0%	11.6%	12.7%
5 - MODERATELY CROWDED	24.1%	24.5%	24.0%	23.1%
6	7.1%	6.6%	4.6%	9.1%
7 - VERY CROWDED	4.2%	4.1%	2.4%	5.0%
MISSING	.9%	.7%	1.8%	.8%

Highlights: About a third of anglers (35% of Annual, 31% of Senior,

and 37% of Combination license holders) report the area they
fish most in Colorado is moderately to very crowded (responses
5, 6, 7). About a quarter (23% of Annual, 29% of Senior, and
24% of Combination license holders) report the area they fish
most is not at all or less than slightly crowded (responses 1
and 2).

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 5 (continued). ANGLERS' EXPERIENCE AND RESPONSE TO CROWDING

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
DOES THE SPECIFIC LEVEL OF CROWDING YOU IDENTIFIED IN THE PREVIOUS QUESTION HAVE ANY EFFECT ON THE ENJOYMENT OF YOUR FISHING TRIPS?				
INCREASES MY ENJOYMENT	5.4%	5.5%	5.2%	5.4%
NO EFFECT ON MY ENJOYMENT	32.8%	31.4%	51.7%	30.4%
DECREASES MY ENJOYMENT	60.8%	62.4%	41.0%	63.1%
MISSING	1.0%	.8%	2.1%	1.1%

Highlights: About 63% of Annual and Combination license holders report the level of crowding they experience while fishing at their usual fishing site decreases the enjoyment of their fishing trip, while a majority (52%) of Senior license holders report the level of crowding they experience has no effect on the enjoyment of their fishing trip.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 6. ANGLER TRIPS, DAYS, AND SATISFACTION WITH COLORADO FISHING IN 1997

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>DID YOU ACTUALLY FISH IN COLORADO IN 1997?</i>				
NO	4.2%	2.9%	9.4%	5.5%
YES	94.8%	96.2%	88.4%	93.4%
MISSING	1.0%	.9%	2.1%	1.0%

Highlights: Senior license holders are the most likely (9.4%) to buy a fishing license and then not go fishing in Colorado.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

NOTE: The rest of Table 6 refers to a slightly different population than did Tables 3, 4, and 5, and the first question in Table 6. Those previous tables were based on the entire sample of Colorado resident anglers holding Annual, Senior, and Combination licenses in 1997. The rest of Table 6 is based on the subsample of those who actually fished in Colorado in 1997, i.e. the 95.8% of the combined license types who **did not answer "NO"** to the previous question.

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
IN 1997, DID YOU FISH...				
ONLY COLORADO	67.6%	69.6%	71.5%	61.6%
MOSTLY COLORADO	24.2%	23.1%	20.1%	28.0%
MOSTLY OTHER	2.4%	2.2%	2.3%	3.0%
ABOUT HALF COLORADO	5.2%	4.7%	4.0%	6.6%
MISSING	.7%	.4%	2.0%	.8%

Highlights: Around 90% of anglers in all three license types report they fished only or mostly in Colorado in 1997. A substantial number of Colorado resident anglers (30% of Annual, 26% of Senior, and 37% of Combination license holders--the sum of Mostly Colorado, Mostly Other, and About Half Colorado) report fishing in other states during 1997.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS WHO ACTUALLY FISHED IN COLORADO IN 1997

TABLE 6 (continued). ANGLER TRIPS, DAYS, AND SATISFACTION WITH COLORADO FISHING IN 1997

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
HOW MANY FISHING TRIPS DID YOU TAKE TO ANY SITE IN COLORADO IN 1997?				
1 - 2	7.7%	8.0%	11.4%	5.9%
3 - 5	22.8%	22.5%	28.5%	21.7%
6 - 10	25.8%	26.6%	20.8%	25.1%
11 - 15	12.5%	12.5%	11.7%	12.8%
16 - 25	14.7%	14.3%	11.7%	16.5%
26 - 35	6.4%	6.2%	4.0%	7.6%
36 - 50	4.9%	5.4%	4.0%	4.2%
51 - 75	1.7%	1.4%	2.3%	2.3%
OVER 75	2.0%	2.1%	1.3%	2.1%
MISSING	1.4%	1.0%	4.0%	1.7%
SUMMARY				
Mean.....	16.12	16.15	13.31	16.82
Std. Err. Mean.....	.36	.47	.97	.67
Median.....	10.00	10.00	7.00	10.00
Std. Deviation.....	22.34	23.31	16.47	21.29
Nonmissing Cases.....	3768.00	2477.00	286.00	1005.00

Highlights: The number of fishing trips taken to any site in

Colorado in 1997 averaged 16 for Annual license holders, 13 for Seniors, and 17 for Combination license holders. The medians were 10 trips for Annual and Combination license holders and 7 trips for Seniors. Seniors were the most likely (about 40%) to have taken 5 or fewer trips.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS WHO ACTUALLY FISHED IN COLORADO IN 1997

TABLE 6 (continued). ANGLER TRIPS, DAYS, AND SATISFACTION WITH COLORADO FISHING IN 1997

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
HOW MANY DAYS DID YOU FISH IN COLORADO IN 1997?				
1 - 2	5.5%	5.7%	8.4%	4.3%
3 - 5	15.1%	15.4%	16.1%	14.3%
6 - 10	22.5%	23.3%	21.1%	20.8%
11 - 15	13.8%	13.9%	16.4%	13.0%
16 - 20	11.2%	11.2%	9.7%	11.6%
21 - 25	6.2%	6.0%	5.7%	6.8%
26 - 35	9.8%	9.2%	5.0%	12.4%
36 - 50	7.6%	7.5%	7.4%	7.9%
51 - 75	3.6%	3.3%	5.7%	3.7%
OVER 75	3.5%	3.4%	2.0%	4.0%
MISSING	1.2%	1.1%	2.3%	1.0%
SUMMARY				
Mean.....	21.41	20.99	19.79	22.88
Std. Err. Mean.....	.44	.54	1.65	.88
Median.....	14.00	13.00	12.00	15.00
Std. Deviation.....	27.21	26.82	28.19	27.84
Nonmissing Cases.....	3778.00	2475.00	291.00	1012.00

Highlights: Number of days fished in Colorado in 1997 averaged 21

for Annual license holders, 20 for Seniors, and 23 for Combination license holders. The medians were 13, 12, and 15, respectively. Combining these numbers with the numbers of fishing trips implies average trip lengths of 1.3 days for Annual license holders, 1.5 days for Seniors, and 1.4 days for Combination license holders, indicating that many fishing trips by all three license types are day trips.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS WHO ACTUALLY FISHED IN COLORADO IN 1997

TABLE 6 (continued). ANGLER TRIPS, DAYS, AND SATISFACTION WITH COLORADO FISHING IN 1997

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
IN 1997, ABOUT HOW MANY DIFFERENT SITES DID YOU FISH IN COLORADO?				
1 - 3	48.3%	49.6%	63.1%	41.0%
4 - 7	37.3%	37.4%	25.2%	40.7%
8 - 12	9.3%	8.5%	7.4%	11.8%
13 OR MORE	4.2%	4.0%	1.7%	5.6%
MISSING	.8%	.6%	2.7%	.9%

Highlights: Senior license holders are more likely to fish a

smaller number of sites in Colorado than are holders of the other license types. About half of Annual license holders, 63% of Seniors, and 41% of Combination license holders report fishing at 1 to 3 different sites in Colorado in 1997. The median for Annual license holders is barely over into the 4 to 7 category, the median for Seniors is in the 1 to 3 sites category, and the median for Combination license holders is well into the 4 to 7 category.

**OVERALL, ON A SCALE OF 1 TO 7,
HOW SATISFIED WERE YOU WITH
YOUR 1997 FISHING EXPERIENCES
IN COLORADO?**

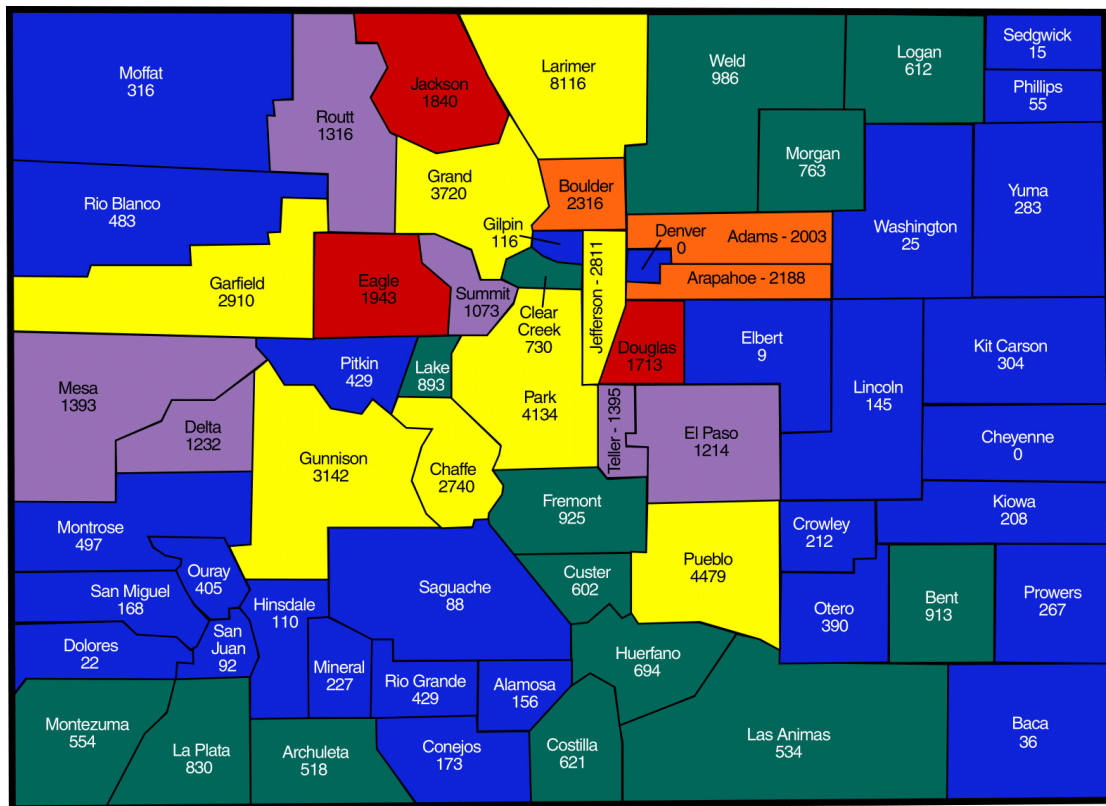
1 - STRONGLY DISSATISFIED	5.5%	5.5%	5.4%	5.5%
2 - SOMEWHAT DISSATISFIED	10.8%	9.7%	13.8%	12.5%
3 - SLIGHTLY DISSATISFIED	12.0%	11.4%	14.4%	12.8%
4 - NEUTRAL	12.2%	11.6%	12.4%	13.4%
5 - SLIGHTLY SATISFIED	14.3%	14.1%	13.8%	15.2%
6 - SOMEWHAT SATISFIED	32.5%	34.1%	28.9%	29.5%
7 - STRONGLY SATISFIED	12.1%	13.1%	9.1%	10.3%
MISSING	.7%	.4%	2.3%	.9%

Highlights: Annual license holders report the highest level of

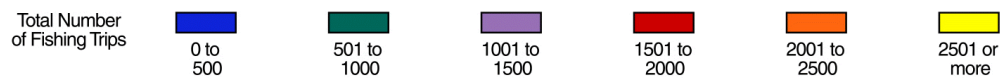
satisfaction with their 1997 fishing experiences in Colorado with about 47% being strongly satisfied or somewhat satisfied (compared to 38% for Seniors and 40% for Combination license holders). A majority of all three license types (61% of Annual, 52% of Senior, and 55% of Combination license holders) report positive satisfaction (slightly, somewhat, or strongly satisfied) with their 1997 Colorado fishing experiences.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS WHO ACTUALLY FISHED IN COLORADO IN 1997

FIGURE 1. RELATIVE DISTRIBUTION OF COLORADO ANGLER TRIPS IN 1997
(based on 1997 Colorado Angler Survey, not adjusted to reflect total license sales)



Colorado Fishing Activity by County
1997 Colorado Angler Survey



RESULTS - PART 2. ANGLER ATTITUDES, BELIEFS, AND PREFERENCES

In order to provide decision makers with up-to-date information on what Colorado resident anglers think about selected fish management topics, respondents were asked to agree or disagree with a series of 37 statements grouped around several topic areas. The series of statements had a second, but equally important, purpose. That was to encourage respondents to think about several issues relevant to their fishing experiences in Colorado. Thinking about those issues and being asked to take a position by agreeing or disagreeing with the statements (after having gone through Part 1 of the questionnaire and answering questions about how, when, and where they fished) put respondents in position to more thoughtfully respond to the economic valuation questions posed in the next part of the survey. Finally, as discussed under Study Methods, this information on attitudes, beliefs, and preferences also provides the basis for combining and comparing different surveys along still other dimensions--defined on several attitudes, beliefs, and preferences.

The topic areas queried included: (1) Angling Motivation and Avidity, (2) Issues Related to Fish Stocking, (3) Whirling Disease, Bag Limits, and Season Closures, (4) Issues Related to License Fees and Program Costs, (5) Issues Related to Crowding, (6) Overall Use of CDOW (Colorado Division of Wildlife) Resources and License Income, (7) Overall CDOW Performance Rating.

The results in Part 2 are presented in seven tables (each table includes multiple statements) organized by the topic areas listed above. In each table, the statements from the survey are presented along with tabulations of the agree/disagree responses. For most of the statements, following the tabulation, a "Highlight" is included summarizing the results or pointing out an item of particular interest. For a few closely related or complementary statements, a Highlight is presented for two or three statements together, or summarizing a series of statements following a line of thought. Results in this Part are based on the entire sample of Colorado anglers, numbering 3,990. Of those 3,990 responses, 2,579 (64.6%) are Annual license holders, 329 (8.2%) are Senior license holders, and 1,082 (27.1%) are Combination license holders.

The best use of the tables, and the information from the survey, can be obtained by studying and thinking about the responses to each statement. The Highlights are meant to emphasize key points, they are not meant to completely summarize the information.

TABLE 7. ANGLING MOTIVATION AND AVIDITY

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>THE MAIN REASON I FISH IS FOR FOOD.</i>				
STRONGLY AGREE	5.0%	5.0%	6.4%	4.6%
MODERATELY AGREE	9.7%	9.2%	10.9%	10.5%
NEUTRAL	14.3%	13.4%	15.5%	16.0%
MODERATELY DISAGREE	22.8%	22.7%	19.8%	24.0%
STRONGLY DISAGREE	46.0%	47.5%	44.1%	42.9%
MISSING	2.2%	2.2%	3.3%	1.9%

Highlights: Only about 15% of anglers overall, and in each license type, say the main reason they fish is for food.

I AM AN AVID ANGLER.

STRONGLY AGREE	24.3%	23.2%	17.0%	29.0%
MODERATELY AGREE	27.8%	27.8%	24.6%	28.8%
NEUTRAL	27.7%	27.7%	30.7%	26.8%
MODERATELY DISAGREE	13.2%	13.9%	17.0%	10.4%
STRONGLY DISAGREE	5.0%	5.4%	7.0%	3.4%
MISSING	2.0%	2.0%	3.6%	1.5%

Highlights: A majority of Annual (51%) and Combination (57.8%) license holders, and a plurality (41.6%) of Senior license holders report being avid anglers.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 7 (continued). ANGLING MOTIVATION AND AVIDITY

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>FISHING IS OK, BUT I CAN TAKE IT OR LEAVE IT.</i>				
STRONGLY AGREE	3.7%	3.1%	9.1%	3.3%
MODERATELY AGREE	9.4%	9.6%	14.3%	7.3%
NEUTRAL	13.3%	12.9%	18.8%	12.5%
MODERATELY DISAGREE	32.3%	33.2%	28.0%	31.6%
STRONGLY DISAGREE	40.1%	39.9%	27.4%	44.5%
MISSING	1.3%	1.3%	2.4%	.8%

Highlights: A strong majority of all three license types disagree with the statement "Fishing is OK, but I can take it or leave it." Senior license show the least disagreement (55%).

***FISHING IS MY MOST IMPORTANT
RECREATIONAL ACTIVITY.***

STRONGLY AGREE	21.4%	22.3%	27.1%	17.5%
MODERATELY AGREE	23.2%	23.7%	18.5%	23.5%
NEUTRAL	22.5%	22.5%	19.1%	23.6%
MODERATELY DISAGREE	18.6%	17.9%	16.1%	21.3%
STRONGLY DISAGREE	13.3%	12.9%	16.7%	13.2%
MISSING	1.0%	.8%	2.4%	1.0%

Highlights: A plurality (over 40%) of each license type agree that fishing is their most important recreational activity.

Combining the last three statements indicates that Colorado anglers are dedicated to fishing. The bulk of anglers describe themselves as avid, a strong majority report more than a lukewarm affinity for fishing, and a plurality consider fishing to be their most important recreational activity.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 7 (continued). ANGLING MOTIVATION AND AVIDITY

STATEMENT AND RESPONSE	COMBINED LICENSE TYPES	LICENSE TYPE		
		ANNUAL	SENIOR	COMBINATION

***A FISHING TRIP IS SUCCESSFUL
ONLY IF I CATCH MY LIMIT.***

STRONGLY AGREE	2.9%	3.0%	1.8%	3.0%
MODERATELY AGREE	5.0%	4.9%	5.2%	5.1%
NEUTRAL	11.4%	11.1%	17.9%	10.3%
MODERATELY DISAGREE	28.8%	28.8%	25.5%	30.0%
STRONGLY DISAGREE	50.9%	51.5%	46.5%	50.6%
MISSING	1.0%	.7%	3.0%	1.0%

Highlights: An overwhelming majority (80% of Annual and Combination

license holders, and 72% of Seniors) disagree that "A fishing trip is successful only if I catch my limit.

***I CAN HAVE A SUCCESSFUL
FISHING TRIP EVEN IF I DON'T
CATCH A SINGLE FISH.***

STRONGLY AGREE	41.2%	41.9%	39.2%	40.2%
MODERATELY AGREE	35.8%	36.3%	36.8%	34.6%
NEUTRAL	7.1%	6.9%	8.2%	7.3%
MODERATELY DISAGREE	10.7%	10.0%	11.2%	12.4%
STRONGLY DISAGREE	4.2%	4.1%	2.4%	4.9%
MISSING	1.0%	.9%	2.1%	.6%

Highlights: A strong majority (about 75%) of all license types

agree they can have a successful fishing trip without catching any fish.

Combining the last two statements indicates that actually catching fish is not the sole determinant of fishing trip success. But catching fish is not an insignificant contributor, as evidenced by the slightly stronger majority of Annual and Combination license holders disagreeing with success being determined by catching one's limit than agreeing with success being achievable even if no fish are caught. Likewise, for all three license types, more anglers disagree that a trip can be successful if no fish are caught than agree that a trip is only successful if one catches the limit, i.e., over 90% of anglers do not need to catch their limit to have a successful trip but a slightly smaller percentage, about 85% of all anglers, do not need to catch any fish at all to have a successful trip.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 8. ISSUES RELATED TO FISH STOCKING

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>I LIKE TO CATCH HATCHERY RAISED TROUT.</i>				
STRONGLY AGREE	1.8%	1.7%	2.1%	2.0%
MODERATELY AGREE	8.7%	9.1%	5.2%	8.8%
NEUTRAL	46.8%	48.4%	46.8%	43.0%
MODERATELY DISAGREE	23.1%	22.9%	24.9%	22.9%
STRONGLY DISAGREE	18.5%	17.1%	18.5%	22.1%
MISSING	1.1%	.9%	2.4%	1.2%

Highlights: Many more anglers disagree than agree with the statement "I like to catch hatchery raised trout" (about 40% vs. about 10%), but close to half the anglers report being neutral to the statement.

***I DO NOT LIKE TO FISH IN
WATERS THAT ARE STOCKED
WITH HATCHERY RAISED TROUT.***

STRONGLY AGREE	4.3%	4.1%	2.7%	5.2%
MODERATELY AGREE	10.9%	10.1%	9.4%	13.3%
NEUTRAL	35.6%	36.0%	34.3%	34.9%
MODERATELY DISAGREE	30.0%	30.2%	27.7%	30.2%
STRONGLY DISAGREE	17.9%	18.4%	23.4%	15.2%
MISSING	1.3%	1.3%	2.4%	1.1%

Highlights: Close to half of anglers overall, and 51% of Senior license holders, disagree with the statement: "I do not like to fish in waters that are stocked with hatchery raised trout," with about a third of anglers being neutral as to whether they like to fish in trout stocked waters.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 8 (continued). ISSUES RELATED TO FISH STOCKING

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>WITHOUT THE TROUT STOCKING PROGRAM PEOPLE WOULD CATCH HARDLY ANY TROUT IN COLORADO.</i>				
STRONGLY AGREE	21.8%	21.2%	30.4%	20.5%
MODERATELY AGREE	35.0%	34.5%	37.1%	35.7%
NEUTRAL	22.2%	24.0%	14.9%	19.9%
MODERATELY DISAGREE	15.1%	14.3%	11.9%	17.9%
STRONGLY DISAGREE	5.0%	5.3%	2.7%	4.9%
MISSING	1.0%	.7%	3.0%	1.1%

Highlights: The majority of anglers of each license type agree that without the trout stocking program people would catch hardly any trout in Colorado, with Seniors expressing the strongest agreement.

***FISHING IN COLORADO WOULD BE
GOOD EVEN WITHOUT THE TROUT
STOCKING PROGRAM.***

STRONGLY AGREE	3.7%	4.0%	3.3%	3.0%
MODERATELY AGREE	13.7%	13.5%	11.2%	14.7%
NEUTRAL	26.9%	27.5%	21.3%	27.3%
MODERATELY DISAGREE	32.7%	33.3%	31.3%	31.5%
STRONGLY DISAGREE	21.9%	20.6%	30.4%	22.6%
MISSING	1.2%	1.1%	2.4%	.9%

Highlights: The majority of anglers of each license type disagree that fishing in Colorado would be good even without the trout stocking program. Senior license holders express the strongest disagreement.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 8 (continued). ISSUES RELATED TO FISH STOCKING

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>IF THE TROUT STOCKING PROGRAM CAN'T PAY ITS WAY IT SHOULD BE ELIMINATED.</i>				
STRONGLY AGREE	4.5%	4.4%	4.0%	4.9%
MODERATELY AGREE	9.1%	8.7%	7.0%	10.6%
NEUTRAL	21.8%	22.4%	19.1%	21.3%
MODERATELY DISAGREE	30.7%	30.9%	27.1%	31.2%
STRONGLY DISAGREE	33.0%	32.8%	40.4%	31.1%
MISSING	.9%	.8%	2.4%	.8%

Highlights: About 64% of anglers overall disagree with the

statement "If the trout stocking program cannot pay its way it should be eliminated." Senior license holders express the strongest disagreement, but over 60% in each license type disagree. Conversely, less than 15% overall agree with the statement.

This statement and the previous one suggest Colorado anglers support maintaining the trout stocking program at some level, even if the program must be subsidized.

**THE TROUT STOCKING PROGRAM
ENCOURAGES PEOPLE WHO WANT
TO CATCH STOCKED TROUT TO
STAY IN STOCKED WATERS AND
OUT OF OTHER TYPES OF WATERS.**

STRONGLY AGREE	10.0%	10.2%	11.6%	9.1%
MODERATELY AGREE	32.2%	32.1%	25.8%	34.4%
NEUTRAL	25.9%	26.6%	25.2%	24.4%
MODERATELY DISAGREE	19.7%	19.9%	17.0%	20.1%
STRONGLY DISAGREE	10.8%	10.3%	16.7%	10.4%
MISSING	1.3%	.9%	3.6%	1.6%

Highlights: There is a plurality of agreement across all three

license types that the trout stocking program encourages people who want to catch stocked trout to stay in stocked waters and out of other types of waters.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 8 (continued). ISSUES RELATED TO FISH STOCKING

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
THE DIVISION OF WILDLIFE SHOULD INCREASE THE NUMBER OF TROUT THEY STOCK.				
STRONGLY AGREE	15.5%	15.7%	21.3%	13.3%
MODERATELY AGREE	29.5%	29.6%	32.8%	28.3%
NEUTRAL	42.3%	42.5%	35.0%	44.1%
MODERATELY DISAGREE	8.5%	8.3%	6.7%	9.3%
STRONGLY DISAGREE	3.2%	3.0%	2.1%	4.0%
MISSING	1.0%	.9%	2.1%	1.0%

**THE DIVISION OF WILDLIFE
SHOULD INCREASE THE NUMBER
OF WARMWATER FISH THEY STOCK.**

STRONGLY AGREE	19.1%	17.4%	18.2%	23.3%
MODERATELY AGREE	20.7%	20.5%	18.5%	21.7%
NEUTRAL	49.7%	51.8%	48.3%	45.3%
MODERATELY DISAGREE	5.8%	5.7%	7.3%	5.8%
STRONGLY DISAGREE	3.5%	3.5%	5.5%	3.1%
MISSING	1.2%	1.2%	2.1%	.7%

Highlights: The last two statements indicate that not a lot of

anglers disagree that the Colorado Division of Wildlife should increase the number of fish they stock. But, there appear to be some differences by license type. Higher percentages of Annual and Senior license holders agree that more trout should be stocked than agree that more warm water species should be stocked. The reverse holds for Combination license holders--a higher percentage agrees that more warm water species should be stocked than agree that more trout should be stocked.

For neither of the statements, however, is there overwhelming agreement that stocking should be increased. The only majority is Senior license holders agreeing that trout stocking should be increased. There are also large percentages of anglers who are neutral toward both statements. These results will be further amplified later (in Results - Part 3) when the fee increase results are discussed.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 9. WHIRLING DISEASE, BAG LIMITS, AND SEASON CLOSURES

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>WHIRLING DISEASE IS THE BIGGEST THREAT TO TROUT FISHING IN COLORADO.</i>				
STRONGLY AGREE	26.4%	25.0%	34.7%	27.1%
MODERATELY AGREE	26.5%	26.7%	24.6%	26.8%
NEUTRAL	31.7%	33.7%	22.8%	29.6%
MODERATELY DISAGREE	9.5%	9.2%	7.9%	10.9%
STRONGLY DISAGREE	4.3%	3.8%	7.3%	4.4%
MISSING	1.6%	1.7%	2.7%	1.2%

Highlights: A majority of anglers of all three license types agree with the statement "Whirling disease is the biggest threat to trout fishing in Colorado," with Senior license holders showing the strongest majority.

***BAG LIMITS FOR TROUT SHOULD
BE LOWERED IF NECESSARY TO
PROTECT TROUT POPULATIONS.***

STRONGLY AGREE	43.2%	45.4%	29.5%	42.3%
MODERATELY AGREE	30.1%	29.8%	32.5%	29.9%
NEUTRAL	12.8%	12.0%	18.2%	12.8%
MODERATELY DISAGREE	7.3%	6.9%	7.9%	8.1%
STRONGLY DISAGREE	5.6%	5.2%	9.4%	5.4%
MISSING	1.1%	.8%	2.4%	1.4%

Highlights: While strong majorities of anglers of all three license types agree that bag limits for trout should be lowered if necessary to protect trout populations, those holding Senior licenses do so with the smallest majority.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 9 (continued). WHIRLING DISEASE, BAG LIMITS, AND SEASON CLOSURES

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>BAG LIMITS FOR TROUT SHOULD BE LOWERED IF NECESSARY TO PROTECT TROUT POPULATIONS, EVEN IF THAT MEANS A LIMIT OF TWO TROUT PER DAY.</i>				
STRONGLY AGREE	34.8%	36.0%	22.5%	35.7%
MODERATELY AGREE	31.3%	32.1%	32.2%	29.2%
NEUTRAL	11.4%	11.1%	12.5%	11.8%
MODERATELY DISAGREE	12.6%	11.9%	14.9%	13.5%
STRONGLY DISAGREE	8.8%	8.0%	15.8%	8.7%
MISSING	1.1%	1.0%	2.1%	1.1%

Highlights: A smaller majority of anglers (but still a majority) in all three license types (compared to the previous statement) agree that bag limits should be lowered if necessary to protect trout populations even if that means a limit of two trout per day. Again, Senior license holders show a smaller majority than do Annual or Combination license holders.

There is more disagreement, but anglers appear supportive of very strict bag limits if they are needed to protect trout populations.

***SEASON CLOSURES FOR TROUT
WOULD BE OK IF THEY WERE
NEEDED TO PROTECT TROUT
POPULATIONS.***

STRONGLY AGREE	32.8%	33.4%	36.2%	30.3%
MODERATELY AGREE	39.3%	40.8%	36.5%	36.5%
NEUTRAL	13.3%	12.6%	14.3%	14.8%
MODERATELY DISAGREE	8.1%	7.8%	5.2%	9.8%
STRONGLY DISAGREE	5.4%	4.5%	5.5%	7.6%
MISSING	1.1%	.9%	2.4%	1.0%

Highlights: Strong majorities of all three license types agree with the statement "Season closures would be OK if they were needed to protect trout populations," with Combination license holders showing the smallest majority.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 9 (continued). WHIRLING DISEASE, BAG LIMITS, AND SEASON CLOSURES

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>I WOULD RATHER HAVE A DECREASE IN BAG LIMITS FOR TROUT THAN SEASON CLOSURES FOR TROUT.</i>				
STRONGLY AGREE	29.1%	29.4%	19.8%	31.3%
MODERATELY AGREE	33.1%	34.2%	28.9%	31.6%
NEUTRAL	19.4%	18.5%	25.5%	20.0%
MODERATELY DISAGREE	10.0%	10.0%	11.9%	9.4%
STRONGLY DISAGREE	7.3%	7.0%	11.6%	6.6%
MISSING	1.1%	.9%	2.4%	1.1%

Highlights: Annual and Combination license holders show strong

majorities in agreement with the statement "I would rather have an decrease in bag limits for trout than season closures for trout." Senior license holders show just short of a majority (49%) in agreement with that statement.

Based on the preceding series of statements, anglers are willing to live with restrictions on their fishing if they are needed to protect trout populations. Stricter bag limits appear to be preferred to season closures as a mechanism for protecting trout populations.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 10. ISSUES RELATED TO LICENSE FEES AND PROGRAM COSTS

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
THE PEOPLE WHO FISH FOR STOCKED TROUT ARE THE ONES WHO SHOULD PAY FOR THE TROUT STOCKING PROGRAM.				
STRONGLY AGREE	8.0%	8.3%	7.6%	7.3%
MODERATELY AGREE	18.4%	18.1%	18.5%	19.3%
NEUTRAL	28.0%	27.8%	29.8%	27.8%
MODERATELY DISAGREE	23.3%	24.0%	17.3%	23.5%
STRONGLY DISAGREE	21.3%	21.2%	23.4%	20.8%
MISSING	1.1%	.7%	3.3%	1.3%

Highlights: Overall, and for each license type, substantially more anglers disagree than agree (about 44% vs. about 26%) with the statement that "people who fish for stocked trout are the ones who should pay for the trout stocking program."

THE COST OF PROVIDING RECREATIONAL FISHING SHOULD BE SHARED EQUALLY BY ALL ANGLERS.

STRONGLY AGREE	48.7%	49.0%	52.9%	46.7%
MODERATELY AGREE	29.2%	30.2%	25.8%	28.0%
NEUTRAL	12.8%	12.3%	11.2%	14.3%
MODERATELY DISAGREE	5.4%	4.9%	2.4%	7.6%
STRONGLY DISAGREE	2.9%	2.8%	4.6%	2.5%
MISSING	1.0%	.7%	3.0%	.9%

Highlights: Overall, and for each type of license, a strong majority (about 78%) of anglers agree with the statement "The cost of providing recreational fishing should be shared equally by all anglers."

These last two statements suggest that Colorado anglers would not generally favor going to more of a "user pay" system of supporting the trout stocking program. This notion will be further supported in Results - Part 3, when the fee increase results are discussed.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 10 (continued). ISSUES RELATED TO LICENSE FEES AND PROGRAM COSTS

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
THE PRICE OF A LICENSE DOES NOT REALLY AFFECT WHETHER I BUY A FISHING LICENSE.				
STRONGLY AGREE	21.6%	21.8%	22.2%	20.9%
MODERATELY AGREE	32.4%	32.3%	31.9%	32.5%
NEUTRAL	12.2%	11.6%	11.6%	14.0%
MODERATELY DISAGREE	21.4%	22.3%	16.4%	20.7%
STRONGLY DISAGREE	11.3%	10.9%	15.8%	10.9%
MISSING	1.2%	1.2%	2.1%	.9%

Highlights: A majority of anglers of each license type agree with the statement "The price of a license does NOT really affect whether I buy a fishing license." That implies demand for fishing licenses is not sensitive to price (demand for fishing licenses is price inelastic in economic terms), which will be further borne out in Results - Part 3 when the fee increase results are discussed.

**I WOULD RATHER HAVE AN
INCREASE IN FISHING LICENSE
FEES THAN A DECREASE IN BAG
LIMITS FOR TROUT.**

STRONGLY AGREE	7.0%	6.9%	9.7%	6.5%
MODERATELY AGREE	13.9%	13.8%	14.6%	14.0%
NEUTRAL	23.6%	22.6%	24.9%	25.4%
MODERATELY DISAGREE	29.1%	29.9%	26.1%	27.9%
STRONGLY DISAGREE	24.9%	25.3%	21.9%	25.0%
MISSING	1.5%	1.4%	2.7%	1.2%

Highlights: A majority of Annual and Combination license holders disagree with the statement "I would rather have an increase in fishing license fees than a decrease in bag limits for trout." Senior license holders show just short of a majority disagreeing with that statement. All three license types prefer restrictions in bag limits to an increase in license fees.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 10 (continued). ISSUES RELATED TO LICENSE FEES AND PROGRAM COSTS

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION

***I WOULD RATHER HAVE AN INCREASE
IN FISHING LICENSE FEES THAN
SEASON CLOSURES FOR TROUT.***

STRONGLY AGREE	12.9%	12.8%	10.6%	13.8%
MODERATELY AGREE	19.1%	18.5%	20.7%	19.9%
NEUTRAL	21.0%	21.1%	18.2%	21.6%
MODERATELY DISAGREE	21.6%	22.4%	21.6%	19.5%
STRONGLY DISAGREE	24.1%	24.0%	25.5%	24.0%
MISSING	1.4%	1.2%	3.3%	1.2%

Highlights: Season closures for trout would be preferred to an

increase in fishing license fees, as indicated by the level of disagreement with the statement "I would rather have an increase in fishing license fees than season closures for trout." The disparity between percentages of anglers agreeing and disagreeing is smaller for this season closure statement than for the bag limit statement shown just previously. That suggests anglers are less certain that season closures are preferred over a fee increase.

In the previous table (9) it was shown that anglers prefer bag limits over season closures as mechanisms to protect trout populations. These last two statements reinforce that conclusion (more anglers would agree to an increase in license fees to avoid season closures for trout than would agree to an increase in license fees to avoid decreased bag limits for trout). Further, these last two statements show both decreased bag limits and season closures to be preferable to an increase in license fees as a mechanism for protecting trout populations.

***IF BAG LIMITS FOR TROUT ARE
LOWERED IT WOULD STILL BE OK
TO INCREASE LICENSE FEES TO PAY
FOR THE TROUT STOCKING PROGRAM
IF THAT IS WHAT IT TAKES.***

STRONGLY AGREE	10.1%	9.8%	12.5%	10.2%
MODERATELY AGREE	27.5%	27.7%	24.3%	27.9%
NEUTRAL	16.5%	17.4%	13.4%	15.2%
MODERATELY DISAGREE	21.3%	21.2%	18.8%	22.1%
STRONGLY DISAGREE	23.0%	22.3%	28.3%	23.2%
MISSING	1.7%	1.6%	2.7%	1.5%

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 10 (continued). ISSUES RELATED TO LICENSE FEES AND PROGRAM COSTS

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>IF THERE IS A CLOSED SEASON FOR TROUT IT WOULD STILL BE OK TO INCREASE LICENSE FEES TO PAY FOR THE TROUT STOCKING PROGRAM IF THAT IS WHAT IT TAKES.</i>				
STRONGLY AGREE	8.0%	7.5%	10.6%	8.5%
MODERATELY AGREE	22.1%	23.0%	20.1%	20.7%
NEUTRAL	19.6%	20.5%	19.5%	17.5%
MODERATELY DISAGREE	23.0%	22.8%	18.5%	24.7%
STRONGLY DISAGREE	26.1%	25.0%	28.9%	27.8%
MISSING	1.2%	1.2%	2.4%	.8%

Highlights: More anglers disagree than agree with both this

statement and the previous one: "If bag limits for trout are lowered it would still be OK to increase license fees to pay for the trout stocking program in that is what it takes" (overall, about 38% agree and about 44% disagree); and "If there is a closed season for trout it would still be OK to increase license fees to pay for the trout stocking program if that is what it takes" (overall about 30% agree and about 49% disagree).

The smaller disparity between the proportions of anglers agreeing and disagreeing with the first statement than with the second statement suggests it would be more acceptable to combine a fee increase with bag limits for trout than to combine a fee increase with season closures for trout.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 11. ISSUES RELATED TO CROWDING

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>SOME AREAS I LIKE TO FISH ARE TOO CROWDED.</i>				
STRONGLY AGREE	19.5%	20.0%	11.2%	20.7%
MODERATELY AGREE	41.8%	42.1%	33.1%	43.8%
NEUTRAL	20.2%	20.0%	26.4%	18.6%
MODERATELY DISAGREE	13.4%	13.0%	21.0%	12.0%
STRONGLY DISAGREE	3.9%	3.6%	5.5%	4.0%
MISSING	1.3%	1.2%	2.7%	.9%

Highlights: A majority of Annual and Combination license holders,
and a plurality of Senior license holders, agree with the
statement "Some areas I like to fish are too crowded."

***I STAY AWAY FROM SOME AREAS
I WOULD LIKE TO FISH BECAUSE
THEY ARE TOO CROWDED.***

STRONGLY AGREE	26.4%	26.6%	16.4%	28.8%
MODERATELY AGREE	35.0%	35.6%	28.9%	35.6%
NEUTRAL	18.8%	18.8%	25.5%	16.7%
MODERATELY DISAGREE	13.7%	13.2%	17.9%	13.6%
STRONGLY DISAGREE	5.2%	5.1%	9.1%	4.4%
MISSING	.9%	.8%	2.1%	.8%

Highlights: A majority of Annual and Combination license holders,
and a plurality of Seniors, agree with the statement "I stay
away from some areas I would like to fish because they are too
crowded." Not only do anglers perceive some areas they like to
fish as being crowded, crowding is affecting their behavior--
they stay away from some areas they would otherwise like to
fish.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 11 (continued). ISSUES RELATED TO CROWDING

STATEMENT AND RESPONSE	COMBINED LICENSE TYPES	LICENSE TYPE		
		ANNUAL	SENIOR	COMBINATION

**IT IS BETTER TO LIMIT THE
NUMBER OF PEOPLE WHO CAN FISH
AT A SITE THAN TO ALLOW THE
SITE TO BECOME CROWDED.**

STRONGLY AGREE	15.5%	16.3%	7.6%	16.0%
MODERATELY AGREE	28.0%	28.8%	19.8%	28.7%
NEUTRAL	22.2%	22.4%	24.9%	20.7%
MODERATELY DISAGREE	19.1%	18.7%	21.3%	19.5%
STRONGLY DISAGREE	14.1%	13.0%	23.4%	13.9%
MISSING	1.1%	.8%	3.0%	1.2%

Highlights: A plurality of Annual and Combination license holders agree, while a plurality of Senior license holders disagrees, with the statement "It is better to limit the number of people who can fish at a site than to allow the site to become crowded."

**I WOULD BE WILLING TO PAY
INCREASED LICENSE FEES TO
SUPPORT CERTAIN KINDS OF
PROGRAMS IF THEY HELPED REDUCE
CROWDING IN AREAS I LIKE TO FISH.**

STRONGLY AGREE	15.6%	15.8%	10.6%	16.7%
MODERATELY AGREE	29.5%	31.2%	21.0%	28.2%
NEUTRAL	28.1%	27.4%	32.2%	28.5%
MODERATELY DISAGREE	14.8%	14.2%	17.3%	15.6%
STRONGLY DISAGREE	10.7%	10.2%	16.7%	10.2%
MISSING	1.2%	1.2%	2.1%	.8%

Highlights: A plurality of Annual and Combination license holders agree with the statement "I would be willing to pay increased license fees to support certain kinds of programs if they helped reduce crowding in areas I like to fish."

Senior license holders appear to be less affected by crowding than are Annual or Combination license holders. Smaller percentages of Seniors report areas they like to fish are too crowded. Senior license holders disagree that limited access is better than crowding while Annual and Combination license holders prefer limited access. Close to half of Annual and Combination license holders would be willing to pay increased fees if they helped reduce crowding while only about a third of Seniors would be willing to do so.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 12. OVERALL USE OF CDOW RESOURCES AND LICENSE INCOME

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>MORE EFFORT SHOULD BE GIVEN TO PROTECTING AND RESTORING FISH HABITAT IN COLORADO.</i>				
STRONGLY AGREE	28.4%	28.5%	28.6%	28.3%
MODERATELY AGREE	41.6%	40.9%	42.2%	43.2%
NEUTRAL	24.1%	24.9%	22.2%	22.8%
MODERATELY DISAGREE	3.3%	3.2%	3.0%	3.7%
STRONGLY DISAGREE	1.3%	1.3%	1.8%	1.1%
MISSING	1.3%	1.3%	2.1%	.9%

Highlights: A strong majority of anglers of all three license types agree (and very few disagree) with the statement "More effort should be given to protecting and restoring fish habitat in Colorado."

***MORE MONEY SHOULD BE DEVOTED
TO DEVELOPING AND MAINTAINING
FISHING SITES NEAR CITIES WHERE
PEOPLE LIVE THAN TO SITES IN
THE MOUNTAINS.***

STRONGLY AGREE	8.6%	8.9%	13.4%	6.6%
MODERATELY AGREE	20.4%	20.0%	25.2%	19.7%
NEUTRAL	26.2%	26.8%	21.3%	26.1%
MODERATELY DISAGREE	26.6%	26.4%	21.0%	28.7%
STRONGLY DISAGREE	17.1%	17.1%	15.8%	17.7%
MISSING	1.2%	.9%	3.3%	1.2%

Highlights: A plurality of Annual and Combination license holders disagree with the statement "More money should be devoted to developing and maintaining fishing sites near cities where people live than to sites in the mountains." Senior license holders are about evenly split between agreement and disagreement.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 12 (continued). OVERALL USE OF CDOW RESOURCES AND LICENSE INCOME

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>IT IS IMPORTANT FOR FISHING LICENSE FEES TO BE USED TO PAY FOR PROGRAMS TO HELP THE RECOVERY OF ENDANGERED FISH.</i>				
STRONGLY AGREE	17.9%	19.9%	15.2%	14.0%
MODERATELY AGREE	30.5%	33.4%	21.6%	26.2%
NEUTRAL	20.8%	21.2%	21.9%	19.4%
MODERATELY DISAGREE	13.8%	11.9%	14.6%	18.1%
STRONGLY DISAGREE	16.1%	12.7%	24.6%	21.4%
MISSING	.9%	.8%	2.1%	.8%

Highlights: A majority of Annual license holders agrees with the statement "It is important for fishing license fees to be used to pay for programs to help the recovery of endangered fish," while Senior and Combination license holders are about evenly split between agreement and disagreement.

***IT IS IMPORTANT FOR FISHING
LICENSE FEES TO BE USED TO
PAY FOR PROGRAMS TO HELP YOUNG
PEOPLE LEARN HOW TO FISH.***

STRONGLY AGREE	16.3%	15.5%	14.9%	18.7%
MODERATELY AGREE	22.5%	22.3%	15.8%	25.1%
NEUTRAL	22.9%	24.7%	24.0%	18.2%
MODERATELY DISAGREE	18.0%	17.9%	17.0%	18.5%
STRONGLY DISAGREE	19.4%	18.9%	25.8%	18.7%
MISSING	.9%	.7%	2.4%	.8%

Highlights: A plurality of Combination license holders agrees with the statement "It is important for fishing license fees to be used to pay for programs to help young people learn how to fish." A plurality of Senior license holders disagrees with that statement, while Annual license holders are about evenly split.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 12 (continued). OVERALL USE OF CDOW RESOURCES AND LICENSE INCOME

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>FISHING LICENSE FEES SHOULD ONLY BE USED FOR PROGRAMS THAT DIRECTLY BENEFIT FISHING.</i>				
STRONGLY AGREE	49.6%	47.0%	61.4%	52.3%
MODERATELY AGREE	30.4%	31.8%	20.7%	30.2%
NEUTRAL	11.9%	12.4%	12.8%	10.4%
MODERATELY DISAGREE	5.4%	6.0%	2.1%	4.8%
STRONGLY DISAGREE	1.5%	1.6%	.9%	1.5%
MISSING	1.2%	1.2%	2.1%	.7%

Highlights: Around 80% of anglers overall, and similar percentages of each license type, agree with the statement "Fishing license fees should only be used for programs that directly benefit fishing."

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 13. OVERALL CDOW PERFORMANCE RATING

STATEMENT AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
THE DIVISION OF WILDLIFE DOES A GOOD JOB MANAGING SPORT FISHING IN COLORADO.				
STRONGLY AGREE	16.6%	16.9%	23.1%	13.7%
MODERATELY AGREE	36.7%	38.6%	37.4%	32.2%
NEUTRAL	27.0%	27.6%	20.7%	27.3%
MODERATELY DISAGREE	12.0%	10.3%	11.6%	16.2%
STRONGLY DISAGREE	6.5%	5.3%	4.9%	9.8%
MISSING	1.3%	1.2%	2.4%	.9%

Highlights: A majority of Annual and Senior license holders, and a plurality of Combination license holders, agree with the statement "The Division of Wildlife does a good job managing sport fishing in Colorado."

**THE DIVISION OF WILDLIFE DOES
A GOOD JOB OF PROTECTING THE
STATE'S FISH RESOURCES AND
HABITAT.**

STRONGLY AGREE	14.6%	14.8%	21.6%	12.1%
MODERATELY AGREE	42.2%	42.8%	40.7%	41.0%
NEUTRAL	27.8%	29.1%	23.4%	26.0%
MODERATELY DISAGREE	9.5%	8.3%	7.6%	12.8%
STRONGLY DISAGREE	4.8%	3.7%	4.6%	7.3%
MISSING	1.2%	1.2%	2.1%	.8%

Highlights: The majority of anglers in all three license types agrees with the statement "The Division of Wildlife does a good job of protecting the State's fish resources and habitat." Anglers give CDOW's performance a slightly higher approval rating for protecting the State's fish resources and habitat than for managing sport fishing. In both cases, the weakest approval comes from Combination license holders.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

RESULTS - PART 3. ECONOMIC VALUATION OF ALTERNATIVE FEE INCREASE PROPOSALS

Anglers were each asked about their willingness to pay increased license fees under two of the various proposals in two question formats. The first was a “dichotomous choice” format in which anglers were asked to respond “Yes” or “No” to a specified price under the conditions described in the proposal. The second was an “open-ended” format in which anglers were asked to state the highest license fee they would pay in response to the proposal.

For example, in the first fee alternative, a proposal was described in which license fees would be increased for all anglers while trout stocking would be maintained at 1997 levels. In the dichotomous choice question, anglers were asked whether they would have bought a license if conditions were the same as 1997 and the license fee was \$X. Six fee amounts, \$22.25, \$26.25, \$32.25, \$44.25, \$68.25, \$124.25, were randomly assigned to questionnaires. Each angler was asked to respond yes or no to **one** of those six amounts. The amounts stated were used as fees for Annual licenses. Fee amounts for Senior and Combination licenses were adjusted to maintain the current relationship between license types. Senior license fee increases were always 50% of the Annual license fee increase and Combination license fee increases were always set at 150% of the Annual license fee increase.⁷ (1997 fees were \$20.25 for resident Annual licenses, \$10.25 for resident Senior licenses, and \$30.25 for resident Combination licenses.)

For the stamp proposals, anglers were first asked whether they would have bought a fishing license under the stated conditions and current license fee. If they said “Yes” to the fishing license, they were asked whether they would have bought the stamp that was described if it cost \$X--Yes or No? Again, the actual questions can be seen on the questionnaires in Appendices 2 and 3.

The yes/no responses were used along with the dollar amounts to estimate a probability distribution function.⁸ That function (which is a mathematical equation) estimates the probability that an angler would be willing to pay any given license fee. For example, one could put a fee of \$26.25 into the equation and calculate the probability that an angler would be willing to pay that license fee. The mean (or average) value, median value (the fee at which 50% of anglers would pay and 50% would not), and other points along the distribution can be calculated to provide different measures of the value placed on a fishing license.

In the open-ended question, which followed the dichotomous choice question on the survey, anglers were asked to write down the most they would have been willing to pay for a 1997 Colorado fishing license under the specified proposal, or for a stamp

⁷The fee amounts reflect fee increases (for Annual licenses) of \$2, \$6, \$12, \$24, \$48, \$104. Those six fee increase amounts were used for the stamp options. In the stamp options, the same amounts were used for all anglers--there were no distinctions between license types.

⁸In order to estimate probability distribution functions from the responses to a dichotomous choice question, the fee amounts must cover the full range of values placed on the activity. One needs some low amounts to which almost everyone will respond “yes,” some high amounts to which almost everyone will respond “no,” and some amounts in between to which there will be a mixture of yes and no responses. Based on several focus groups and a pretest, the six amounts ranging from \$2 to \$104 were selected.

The probability distribution functions summarized here were estimated using a logit model in which the dependent variable was the yes/no response to the dichotomous choice question, and the independent variables were the natural logarithm of the fee/stamp amount specified in the question and a constant term. The models and functional forms are shown in the Technical Supplement to this report.

in the cases of Proposals 3 and 4. Mean, median and other measures of value can be calculated directly from the anglers' responses.

Economic values derived from open-ended questions are generally lower than those derived from dichotomous choice questions. It is thought by some that open-ended values are a more conservative or lower bound estimate of value. It has been suggested that dichotomous choice-based values might be closer to how respondents would actually behave if they were really pushed and faced with the situation described in the valuation scenario, whereas open-ended based values might represent more what a respondent views as a "fair" or "reasonable" price. Those hypotheses are speculations that are under ongoing investigation by economists, but they are worth keeping in mind.

Valuation results for the four fee increase scenarios are summarized in Table 14. (A summary of the valuation results is presented here in the body of the report. Readers interested in very detailed results, including the estimated probability distribution functions and more detailed discussion of the analysis are referred to the Technical Supplement to this report--A Detailed Presentation of the Economic Valuation of Alternative Fee Increase Proposals.) Results in this Part are based on the subsamples of anglers who responded to the various fee increase proposals. Each respondent answered questions about two proposals. Proposal 1 results are based on 1,983 responses (1,316 Annual license holders, 153 Seniors, 514 Combination license holders). Proposal 2 results are based on 1,942 responses (1,250 Annual, 162 Senior, 530 Combination). For Proposal 3, the subsample was 1,902 anglers (1,215 Annual, 156 Senior, 531 Combination). Finally, Proposal 4 results were based on 1,956 responses (1,252 Annual, 157 Senior, 547 Combination). The results for the "Preference Rankings of Fee Increase Alternatives" shown in Tables 15 and 16 are based on the full sample of 3,990 responses (2,579 Annual license holders, 329 Seniors, and 1,082 Combination license holders).

For each of the fee increase proposals, Table 14 presents results for the dichotomous choice-based question followed by results for the open-ended question. For the dichotomous choice question, the mean, median, 25th percentile, 75th percentile, and 90th percentile are presented. For the open-ended question, the mean, 95% confidence interval around the mean, and median are presented. For both question formats, results are presented by license type--Annual, Senior, Combination. The means, medians, and other measures of value are presented as "**net values.**" That is, they are presented as fee increases or amounts **in addition to** fees already paid.

The mean values shown on the table represent the maximum amounts anglers would be willing to pay, on average, as a fee increase--over and above the fees already paid--by license type. The median values are the fee increase amounts that 50% of anglers would be willing to pay and 50% would not. Also shown are the 25th, 75th, and 90th percentiles. The 25th percentile, for example, is the fee increase amount that 25% of anglers would be willing to pay; the 90th percentile is the amount that 90% of anglers would be willing to pay. Conversely, at the 25th percentile, 75% of anglers would not be willing to pay that amount of fee increase; at the 90th percentile, 10% of anglers would not be willing to pay the amount of the fee increase. The median is the same as the 50th percentile.

The best sense of the value placed on a fishing license can be gained by looking at the entire distribution for the dichotomous choice-based results, and at the mean, confidence interval around the mean, and median for the open-ended-based results. The mean is the most common summary measure of value, but it may or may not be the best in any given instance. Many people advocate the median as a better measure of summary value than the mean because the median eliminates the effect of outliers in the data and the effects of skewed distributions. For example, if a distribution of values contains a small number of individuals who can and do place very high monetary values on fishing licenses, the mean will be greater than the median because of those high value individuals. Those high values might be true and accurate--those individuals might indeed place very high values on fishing licenses--but they will result in a skewed distribution and mean. The mean will be above the median. If that mean were used as the summary measure of value, the summary measure would be above the amount at

which 50% of anglers would no longer buy a fishing license. In the case of a symmetric distribution, the mean and median are equal.

There could be cases where even the median value might be inappropriate. One might have a policy objective to maximize participation in fishing. In such a case, it might be more appropriate to consider the 90th percentile, the value at which 90% of anglers would continue to participate. The point is that economic valuation provides information on how much value people place on a given activity. One must consider all the information and decide how it fits the objectives of the decision and which information is most relevant to particular circumstances.

Looking at Proposal 1--dichotomous choice format--on Table 14, Annual license holders would be willing to pay an additional \$36.03, on average, in license fees. At the median value of, 50% of Annual license holders would be willing to pay an additional \$19.45, but 50% would not buy a fishing license at that increased fee--the number of Annual license holders would be cut in half. If license fees increased by \$3.03, 90% of Annual license holders would pay that increase, but the number of Annual license holders would drop by 10%.

Looking at Proposal 1--open-ended format--Annual license holders would be willing to pay a fee increase of \$12.94, on average, based on the open-ended question, with a median of \$9.75. Remember, the median corresponds to the 50th percentile. The 95% confidence interval for Annual license holders is \$11.71 to \$14.17--if one were to analyze multiple samples of Annual license holders and ask how much they would be willing to pay in addition to their Annual license fee if the conditions were the same as they were in 1997, the mean value would fall in that interval 95% of the time. Keep in mind that the open-ended values are a conservative estimate of value, they represent more of a lower bound estimate of mean and median value.

The percentiles shown in the table for the dichotomous choice format can be used to predict how anglers might respond to fee increases under the conditions posed in the proposals. We will illustrate using Proposal 1. The 90th percentile predicts that 90% of Annual license holders would purchase a license, given current conditions of trout stocking, if the fee were increased by \$3.03. Conversely, that means 10% of Annual license holders would drop out if the fee were increased by \$3.03. An increase of \$3.03 is about a 15% fee increase in the current Annual license fee of \$20.25. The fact that sales of regular Annual licenses would fall by 10% if fees increased by 15% means that demand for Annual licenses is not very sensitive to price. It is price inelastic in economic terms (meaning license sales decrease less than proportionately with fee increases).⁹ CDOW could increase revenue by increasing Annual license fees. Looking at the 75th percentile, a fee increase of \$7.68--a 38% fee increase--would result in a 25% decrease in Annual license sales. Again, demand for resident Annual fishing licenses is price inelastic. At the 50th percentile (or the median), a fee increase of 96% (\$19.45) would result in a 50% loss of resident Annual license sales. We conclude that over any reasonable range of fee increases, demand for resident Annual licenses is price inelastic and CDOW could increase revenue by raising license fees.¹⁰ Similar results are obtained for Senior and Combination

⁹Price elasticity of demand is a measure of response. It measures the percentage change in demand resulting from a percentage change in price. If demand for a good is price elastic, it is relatively sensitive to price and demand falls more than proportionately to an increase in price. Price inelastic demand is relatively insensitive to price and demand falls less than proportionately to an increase in price. If demand for a good is price inelastic, total revenue will increase when price is increased. If demand is price elastic, total revenue will decrease when price is increased.

¹⁰The analysis presented here can provide an idea of the price elasticity of demand over relatively wide intervals--between a 0 and 10% fee increase, or between a 0 and 25% fee increase, or between a 10% and 25% increase, etc. The probability distribution functions, presented in the Technical Supplement (the detailed economic analysis), can be used to calculate price elasticity over any range desired.

licenses. Of course, revenue generation needs to be balanced against angler participation--the revenue information is only one part of the story.

Based on the dichotomous choice questions, anglers of all license types are willing to pay more for an across the board fee increase than they are willing to pay for a stamp in addition to their license. Compare the means and medians for Proposal 1 with those for Proposals 3 and 4. Proposal 1 has a mean around \$36 and a median around \$19, whereas Proposals 3 and 4 have means around \$20 to \$25 and medians around \$11 for Annual license holders. Similar differences appear for Senior and Combination license holders.

When one looks at the open-ended format questions for Annual and Senior license holders, the numbers show that same pattern--Annual and Senior license holders are willing to pay more for an across the board fee increase than for a stamp. Combination license holders, however, appear to be willing to pay more for the stamp options than for the across the board fee increase. For all three license types, however, the differences between the open-ended fee increase options and the open-ended stamp options are not statistically significant at the 5% level, as shown by the overlapping confidence intervals.

Based on the open-ended questions, anglers are not willing to pay a higher fee increase if stocking is increased by 25% than if stocking remains at 1997 levels. Responses to the dichotomous choice questions tell a similar story, but it is less clear cut because the estimated probability distributions intersect and cross. At higher levels of fee increase (illustrated by the 25th percentile), Annual and Combination license holders appear to be willing to pay a little more if stocking levels are not increased (Proposal 1), while at lower levels of fee increases (illustrated by the 75th and 90th percentiles) they appear willing to pay a little more if stocking levels are increased (Proposal 2). The opposite pattern appears for Senior license holders--at higher levels of fee increase, Seniors are willing to pay a little more for increased stocking, while at lower levels of fee increase they are willing to pay a little more for no increase in stocking. The message from Annual and Combination license holders might be characterized as "If you can increase stocking for a small amount of money, go ahead and do it, but if it costs a lot of money, don't bother." The message from Senior license holders might be characterized as "We do not want increased stocking enough to pay higher license fees, but if you raise fees by a lot you'd better give us increased stocking in return." On balance, there does not appear to be a high demand for increased trout stocking.

Preference Rankings of Alternative Fee Increase Proposals.

Anglers were asked to preference order some alternative mechanisms proposed to increase the revenue available to CDOW for the trout stocking program. The alternatives in this question corresponded to three of the four fee increase proposals included in the valuation scenarios. Though no individual respondents saw all four fee increase proposals, all respondents were asked to preference order these three mechanisms. As shown in the survey instrument in Appendix 2, the preference ranking question read as follows:

If the Colorado Division of Wildlife needs more money to maintain the trout stocking program at 1997 levels, what form would you prefer to see a fee increase take? (Please rank the following alternatives. Put a **1** next to the option you **most** prefer, a **2** next to your second choice, and a **3** next to the option you **least** prefer.)

_____ An across the board license fee increase for **all anglers**. (Designated here as Choice A)

_____ A stamp that would be required in addition to the license every year for anyone who **fished for trout in waters where catchable size trout are stocked**, whether they kept any trout or not. (Designated here as Choice B)

_____ A stamp that would be required in addition to the license every year for anyone who **fished for trout in any water**, whether catchable size trout are stocked there or not, and whether they kept any trout or not.
(Designated here as Choice C)

Table 15 is a summary of the percentage of respondents who selected each option as their most preferred option. Choice A (an across the board fee increase for all anglers--comparable to Proposal 1) is ranked as the most preferred option by 56.8% of the anglers (61.5% of the nonmissing responses) when all license types are combined. Choice B (a stamp option comparable to Proposal 3) was ranked as most preferred by 22.0% (23.8% of nonmissing respondents). Choice C (comparable to Proposal 4) was ranked as most preferred by 14.3% of the combined anglers (15.5% of nonmissing respondents). Because choices B and C are both stamp options, they could be combined and the comparison made between a fee increase and imposition of a stamp. In this comparison, the across the board fee increase (Choice A) still dominates--61.5% of nonmissing responses vs. 39.3% of nonmissing responses. The same pattern emerges if one looks at the preferences by license type, with Senior license holders showing the most support for the across the board fee increase.

Table 16 shows the complete rankings for each option for all anglers and by license type.¹¹ For all anglers, Choice A is selected as the least preferred option by fewer respondents than either Choice B or C--23% vs. 29% for Choice B and 29% for Choice C (or 26% vs. about 36% for B and C if one looks at nonmissing responses).

An overall similar pattern of results emerges for each license type (Table 16). Senior license holders exhibit the most preference for the across the board fee increase. Annual and Combination license holders appear to be slightly more supportive of the stamp options even though the majorities of both Annual and Combination license holders prefer the across the board fee increase. Based on these results it appears that an across the board fee increase for all anglers is preferable to either of the proposed stamp options.

Of the two stamp options, there appears to be a slight preference for the stocked trout water stamp (Choice B) over the stamp for all trout (Choice C). Both are designated as least preferred by about 29% of anglers. Choice B is most preferred to more anglers and second choice to fewer anglers compared to Choice C. This pattern holds for all license types.

Support for the across the board fee increase alternative is consistent across the different types of questions. In the attitude questions, the majority of anglers thought the cost of providing recreational fishing should be shared equally by all anglers; and a plurality disagreed that the people who fish for stocked trout are the ones who should pay for the trout stocking program. In the willingness to pay questions, anglers appeared willing to pay more when the fee increase was across the board than when it came in the form of a stamp, even though the differences were not statistically significant. Finally, in the preference ranking question, the across the board fee increase was the clearly preferred option.

¹¹ The astute reader will notice that the percentages of those selecting the choices as their most preferred alternative shown in Table 16 are slightly different than those shown in Table 15. There are two reasons for that. First, it is possible for the same person to rank two alternatives as most preferred (a tie). Many respondents put a check mark by one of the alternatives and left the others blank. In that case, the checked alternative was given a #1 ranking and the other two were given a "missing" response. Some respondents ranked two alternatives the same or checked two of the alternatives, leaving the third blank. In such a case, we took what the respondent gave us. If he or she said two alternatives were tied for #1, we recorded both as 1; likewise if two alternatives were ranked #2 or #3. Second, there is a different number of missing responses in the calculations for Table 15 than for Table 16. For Table 15, a case is missing if all three of the rankings for choices A, B, and C are missing. For Table 16, a response can be missing for one alternative but not the others. As a result, the number of missing responses shown varies by alternative and appears higher when one looks at individual alternatives than it is when one looks at the rankings as a complete set.

**Table 14. ECONOMIC VALUATION SUMMARY FOR THE FOUR
FEE INCREASE PROPOSALS**

Proposal 1 -- Increase fee, no increase in stocking -- dichotomous choice format

	<u>Mean</u>	<u>Median</u>	<u>25%ile</u>	<u>75%ile</u>	<u>90%ile</u>
Annual License	\$36.03	\$19.45	\$49.28	\$7.68	\$3.03
Senior License	\$29.38	\$16.88	\$40.59	\$7.02	\$2.92
Combination License	\$63.99	\$30.17	\$85.08	\$10.70	\$3.79

Proposal 1 -- Increase fee, no increase in stocking -- open-ended format

	<u>Mean</u>	<u>95% Confidence Interval</u>	<u>Median</u>
Annual License	\$12.94	\$11.71 - \$14.17	\$9.75
Senior License	\$9.03	\$7.23 - \$10.83	\$5.00
Combination License	\$8.88	\$6.53 - \$11.23	\$4.75

Proposal 2 -- Increase fee, 25% increase in stocking -- dichotomous choice format

	<u>Mean</u>	<u>Median</u>	<u>25%ile</u>	<u>75%ile</u>	<u>90%ile</u>
Annual License	\$31.71	\$19.62	\$44.23	\$8.70	\$3.86
Senior License	\$54.81	\$19.09	\$67.05	\$5.43	\$1.55
Combination License	\$46.44	\$26.38	\$64.06	\$10.86	\$4.47

Proposal 2 -- Increase fee, 25% increase in stocking -- open-ended format

	<u>Mean</u>	<u>95% Confidence Interval</u>	<u>Median</u>
Annual License	\$13.49	\$12.14 - \$14.84	\$9.75
Senior License	\$10.46	\$8.17 - \$12.75	\$7.00
Combination License	\$8.36	\$6.11 - \$10.61	\$4.75

Proposal 3 -- Stocked Trout Water Stamp -- dichotomous choice format

	<u>Mean</u>	<u>Median</u>	<u>25%ile</u>	<u>75%ile</u>	<u>90%ile</u>
Annual License	\$20.57	\$10.45	\$27.80	\$3.93	\$1.48
Senior License	\$13.17	\$6.20	\$17.50	\$2.20	\$0.78
Combination License	\$16.06	\$7.73	\$21.46	\$2.78	\$1.00

Proposal 3 -- Stocked Trout Water Stamp -- open-ended format

	<u>Mean</u>	<u>95% Confidence Interval</u>	<u>Median</u>
Annual License	\$11.09	\$10.33 - \$11.85	\$7.00
Senior License	\$6.06	\$4.77 - \$7.35	\$4.00
Combination License	\$10.09	\$8.60 - \$11.58	\$5.00

**Table 14 (continued). ECONOMIC VALUATION SUMMARY FOR THE FOUR
FEE INCREASE PROPOSALS**

Proposal 4 -- Trout Stamp -- dichotomous choice format

	<u>Mean</u>	<u>Median</u>	<u>25%ile</u>	<u>75%ile</u>	<u>90%ile</u>
Annual License	\$25.44	\$11.85	\$33.73	\$4.17	\$1.46
Senior License	\$19.94	\$5.54	\$22.65	\$1.36	\$0.33
Combination License	\$24.77	\$12.22	\$33.27	\$4.49	\$1.65

Proposal 4 -- Trout Stamp -- open-ended format

	<u>Mean</u>	<u>95% Confidence Interval</u>	<u>Median</u>
Annual License	\$11.47	\$10.49 - \$12.45	\$6.00
Senior License	\$7.45	\$5.37 - \$9.53	\$5.00
Combination License	\$11.40	\$9.95 - \$12.85	\$6.00

TABLE 15. IF THE DIVISION OF WILDLIFE NEEDS MORE MONEY TO MAINTAIN THE TROUT STOCKING
PROGRAM WHICH MANAGEMENT OPTION DO YOU PREFER?
(PERCENTAGE SELECTING EACH OPTION AS FIRST CHOICE)

PREFERRED MANAGEMENT OPTION - FIRST CHOICE	COMBINED LICENSE TYPES	LICENSE TYPE		
		ANNUAL	SENIOR	COMBINATION
FEE INCREASE FOR ALL ANGLERS	56.8%	57.3%	61.1%	54.2%
STAMP FOR TROUT STOCKED WATERS	22.0%	22.2%	16.9%	22.9%
STAMP FOR ALL TROUT	14.3%	14.4%	11.0%	15.1%
MISSING	7.7%	6.9%	11.9%	8.3%

NOTE: PERCENTAGES MAY ADD TO MORE THAN 100% BECAUSE IT WAS POSSIBLE TO HAVE TIES--AN
INDIVIDUAL COULD RANK TWO ALTERNATIVES AS MOST PREFERRED, ETC.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 16. IF THE DIVISION OF WILDLIFE NEEDS MORE MONEY TO MAINTAIN THE TROUT STOCKING PROGRAM WHICH MANAGEMENT OPTION DO YOU PREFER?

MANAGEMENT OPTION AND PREFERENCES	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
FEE INCREASE FOR ALL ANGLERS				
MOST PREFERRED	55.5%	56.1%	59.3%	53.0%
SECOND CHOICE	8.7%	8.9%	7.6%	8.6%
LEAST PREFERRED	22.7%	22.4%	15.2%	25.7%
MISSING	13.1%	12.6%	17.9%	12.8%
STAMP FOR TROUT STOCKED WATERS				
MOST PREFERRED	21.5%	21.8%	16.4%	22.4%
SECOND CHOICE	30.0%	30.1%	28.0%	30.3%
LEAST PREFERRED	29.2%	29.8%	29.8%	27.5%
MISSING	19.3%	18.3%	25.8%	19.8%
STAMP FOR ALL TROUT				
MOST PREFERRED	14.0%	14.1%	10.6%	14.8%
SECOND CHOICE	36.7%	37.4%	33.1%	36.3%
LEAST PREFERRED	29.3%	29.4%	29.5%	29.0%
MISSING	19.9%	19.1%	26.7%	19.9%

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

RESULTS - PART 4. DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS

Questions about demographics and socioeconomic characteristics were asked for two reasons. First, they are used to give additional context to the rest of the questions in the survey. Second, they provide another base by which information can be compiled and compared between surveys, as discussed under Study Methods.

Results in this Part are based on the entire sample of Colorado anglers, numbering 3,990, of which 2,579 (64.6%) are Annual license holders, 329 (8.2%) are Senior license holders, and 1,082 (27.1%) are Combination license holders. The results are presented in the same format as those in Parts 1 and 2. Most of the questions in this Part are straightforward, so fewer comments on “Highlights” are included than in previous Parts.

TABLE 17. SEX OF RESPONDENT

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
ARE YOU...?				
FEMALE	17.7%	22.3%	22.8%	5.1%
MALE	80.1%	75.5%	73.9%	93.1%
MISSING	2.2%	2.2%	3.3%	1.8%

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 18. AGE OF RESPONDENT

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
HOW OLD ARE YOU?				
18 - 25	5.7%	6.4%	.0%	5.6%
26 - 35	16.6%	18.8%	.0%	16.6%
36 - 45	28.6%	31.6%	.0%	29.9%
46 - 55	22.9%	24.0%	.0%	27.0%
56 - 65	15.4%	15.6%	14.3%	15.2%
66 - 75	7.8%	.9%	77.8%	3.1%
OVER 75	.3%	.1%	2.1%	.1%
MISSING	2.8%	2.6%	5.8%	2.3%
SUMMARY				
Mean.....	45.58	43.20	68.08	44.62
Std. Err. Mean.....	.21	.23	.16	.36
Median.....	45.00	43.00	68.00	44.00
Std. Deviation.....	12.90	11.39	2.76	11.72
Nonmissing Cases.....	3878.00	2511.00	310.00	1057.00

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 19. HOUSEHOLD COMPOSITION OF RESPONDENT

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
HOW MANY PEOPLE AGE 18 OR OLDER (INCLUDING YOURSELF) LIVE IN YOUR HOUSEHOLD?				
1	18.3%	17.6%	22.2%	18.8%
2	60.2%	59.7%	63.5%	60.4%
3 - 5	17.1%	18.5%	6.7%	16.9%
6 OR MORE	.4%	.5%	.0%	.4%
MISSING	4.0%	3.7%	7.6%	3.6%
SUMMARY				
Mean.....	2.07	2.10	1.86	2.06
Std. Err. Mean.....	.01	.02	.03	.02
Median.....	2.00	2.00	2.00	2.00
Std. Deviation.....	.81	.83	.61	.81
Nonmissing Cases.....	3830.00	2483.00	304.00	1043.00
HOW MANY PEOPLE UNDER AGE 18 LIVE IN YOUR HOUSEHOLD?				
NONE	58.9%	55.6%	90.3%	57.3%
1	15.9%	17.6%	2.7%	16.0%
2	14.5%	15.7%	.6%	15.8%
3	5.4%	6.2%	.3%	5.2%
4 TO 6	2.0%	2.0%	.0%	2.5%
7 OR MORE	.2%	.2%	.0%	.2%
MISSING	3.2%	2.9%	6.1%	3.0%
SUMMARY				
Mean.....	.73	.80	.05	.77
Std. Err. Mean.....	.02	.02	.02	.04
Median.....	.00	.00	.00	.00
Std. Deviation.....	1.10	1.12	.29	1.14
Nonmissing Cases.....	3863.00	2505.00	309.00	1049.00

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 20. RESPONDENT LENGTH OF RESIDENCE IN COLORADO

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
HOW LONG HAVE YOU LIVED IN COLORADO?				
3 YEARS OR LESS	5.7%	7.2%	2.1%	3.3%
4 - 7 YEARS	8.5%	10.6%	5.5%	4.6%
8 - 15 YEARS	10.0%	10.6%	3.3%	10.5%
16 - 25 YEARS	20.1%	21.5%	7.3%	20.5%
26 - 35 YEARS	19.3%	18.8%	16.4%	21.3%
36 - 50 YEARS	22.3%	20.6%	22.8%	26.1%
OVER 50 YEARS	11.9%	8.5%	38.6%	11.8%
MISSING	2.2%	2.1%	4.0%	1.8%
SUMMARY				
Mean.....	29.00	26.30	44.12	30.91
Std. Err. Mean.....	.28	.33	1.16	.49
Median.....	27.50	25.00	43.00	30.00
Std. Deviation.....	17.44	16.46	20.71	16.07
Nonmissing Cases.....	3903.00	2524.00	316.00	1063.00

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 21. A MEASURE OF RURALNESS

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
ABOUT HOW FAR DO YOU TRAVEL (ONE WAY) TO SHOP FOR YOUR WEEKLY GROCERIES?				
LESS THAN 1 MILE	32.2%	33.1%	36.5%	28.8%
1 - 3 MILES	31.5%	32.1%	32.5%	29.9%
4 - 7 MILES	14.9%	15.2%	10.3%	15.6%
8 - 15 MILES	10.1%	9.5%	8.8%	11.9%
16 - 25 MILES	3.8%	3.2%	3.6%	5.1%
OVER 25 MILES	4.2%	3.5%	3.6%	5.8%
MISSING	3.4%	3.5%	4.6%	2.8%
SUMMARY				
Mean.....	5.67	5.19	4.98	7.02
Std. Err. Mean.....	.17	.20	.49	.38
Median.....	2.00	2.00	2.00	2.50
Std. Deviation.....	10.51	9.85	8.76	12.24
Nonmissing Cases.....	3856.00	2490.00	314.00	1052.00

Highlights: Combination license holders appear to contain a somewhat larger proportion of rural residents than do Annual or Senior license holders, as indicated by the average one way distance to shop for weekly groceries (7 miles for Combination license holders vs. about 5 miles for Annual and Senior license holders). Further, 11% of Combination license holders travel 16 or more miles one way to shop for weekly groceries compared to 6.7% of Annual license holders and 7.2% of Senior license holders.

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 22. EDUCATION LEVEL OF RESPONDENT

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
HOW MUCH SCHOOLING HAVE YOU COMPLETED?				
LESS THAN 8TH GRADE	.6%	.5%	1.8%	.4%
8TH GRADE	.7%	.4%	3.0%	.6%
SOME HIGH SCHOOL	3.8%	3.6%	6.4%	3.3%
HIGH SCHOOL GRADUATE/GED	20.0%	18.8%	30.1%	20.0%
SOME COLLEGE	29.6%	29.5%	30.4%	29.6%
ASSOCIATES DEGREE	12.4%	13.3%	4.0%	12.6%
BACHELORS DEGREE	19.8%	20.6%	10.3%	20.9%
MASTERS DEGREE	7.4%	7.8%	6.1%	6.9%
DOCTORATE	3.0%	2.8%	3.6%	3.4%
MISSING	2.7%	2.6%	4.3%	2.4%

Highlights: Median education levels for all three license types

fall in the "Some College" category (52.8%, 71.7%, and 53.9% of Annual, Senior, and Combination license holders, respectively, fall in that category of education or lower).

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 23. RESPONDENTS' HOUSEHOLD INCOME

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
WHAT WAS YOUR TOTAL HOUSEHOLD INCOME BEFORE TAXES LAST YEAR (IN 1996)?				
\$10,000 OR LESS	2.9%	2.9%	3.6%	2.4%
\$10,001 - \$15,000	3.6%	3.5%	8.5%	2.6%
\$15,001 - \$25,000	9.6%	8.4%	20.1%	9.2%
\$25,001 - \$32,000	10.2%	9.8%	14.0%	9.9%
\$32,001 - \$36,000	6.8%	6.6%	9.1%	6.8%
\$36,001 - \$50,000	19.0%	19.2%	15.8%	19.5%
\$50,001 - \$75,000	21.5%	23.7%	7.9%	20.2%
\$75,001 - \$100,000	9.6%	9.5%	3.3%	11.8%
\$100,001 - \$125,000	3.5%	3.6%	.9%	3.8%
OVER \$125,000	3.7%	3.7%	1.5%	4.3%
MISSING	9.7%	9.2%	15.2%	9.3%

Highlights: Median incomes of both Annual and Combination license

holders fall in the \$36,001 - \$50,000 range (50.4% of anglers in each of those license types fall in that income range or less). The median income of Senior license holders is in the \$32,001 - \$36,000 range (55.3% of Senior license holders fall in that income range or less).

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 24. MEMBERSHIP IN SPORTSMAN'S OR ENVIRONMENTAL GROUPS

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
<i>DO YOU BELONG TO ANY SPORTSMAN'S OR ENVIRONMENTAL GROUPS?</i>				
NO	79.9%	84.4%	88.1%	66.8%
YES	19.1%	15.0%	10.3%	31.7%
MISSING	.9%	.6%	1.5%	1.5%

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

TABLE 25. RACE OF RESPONDENT

QUESTION AND RESPONSE	COMBINED	LICENSE TYPE		
	LICENSE TYPES	ANNUAL	SENIOR	COMBINATION
WHAT DO YOU CONSIDER YOURSELF TO BE?				
BLACK/AFRICAN AMERICAN	1.3%	1.6%	1.5%	.7%
ASIAN OR PACIFIC ISLANDER	.9%	1.2%	1.2%	.2%
NATIVE AMERICAN	1.4%	1.5%	.3%	1.7%
WHITE / CAUCASIAN	81.2%	79.3%	84.2%	84.6%
HISPANIC	7.2%	8.7%	4.9%	4.5%
MULTIPLE RESPONSES	.8%	.7%	.0%	1.2%
MISSING	7.2%	7.1%	7.9%	7.1%

STATEWIDE BREAKDOWN OF RESPONSES FROM COLORADO ANGLERS

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