

## RESULTS

Anglers' expenditures and the economic impacts of those expenditures on each coastal state's economy are discussed in five separate regional sections: the Northeast, Southeast, Pacific Coast, North Pacific, and Hawaii. A sixth section shows the expenditure and impact results for the entire U.S. In each regional section, expenditures and impacts are shown by state and aggregate impacts across regions are provided in the U.S. section. Nine tables of results are shown for each state. The first table shows mean expenditures and standard errors by mode and resident status. The second table shows total expenditures by mode and resident status, as well as 95% confidence intervals for the expenditure estimates. The third table summarizes the total economic impacts attributable to recreational fishing by resident status displaying the direct, indirect, and induced impacts on sales, value-added, income, and employment for resident and non-resident anglers.

Tables four through seven in each state separately detail the impacts on sales, value-added, income, and employment respectively by individual expenditure category. The eighth table displays the total economic impacts generated from saltwater fishing trip expenditures by fishing mode and resident status. This table excludes the impacts of fishing equipment purchases and other durable items that could be used for multiple trips since these could not be linked to a particular mode of fishing. The final table for each state shows the estimated revenue received by federal and state/local governments from angler purchases. The tax revenue estimates are based on data available in IMPLAN's social accounting matrix, which tracks monetary flows between industries and institutions such as households, government, investment, and trade. The rows of the table depict the types of tax payments and the institutions that receive them, while the columns represent the different institutions making each type of tax payment. Employee compensation, enterprise, and indirect business taxes are paid by businesses, while taxes on proprietary income and household expenditures are paid by individuals.

### **Northeast Region**

#### **Expenditures**

Daily mean trip expenditures were generally higher for non-residents than residents in all of the coastal states in the Northeast (1<sup>st</sup> Table for each state). Non-resident anglers tended to travel further and were more inclined to take overnight fishing trips, requiring the use of lodging facilities. Resident anglers in New Hampshire fishing aboard for-hire boats and resident anglers in Connecticut, New Hampshire, and New York fishing from private or rental boats were the only groups of resident anglers to incur higher mean trip expenditures than their non-resident counterparts. The highest single mean trip expense for resident anglers in all of the Northeast coastal states was charter fees. The highest mean trip expense for non-residents was also charter fees in every state except in Maryland and Massachusetts where mean lodging fees exceeded all other trip expenditures.

In contrast to daily trip expenditures, resident anglers in every state but one (Maine) spent considerably more on fishing equipment and durable items in 2006, per angler, than out-of-state anglers. The largest difference in durable expenditures across the two groups of anglers was for boat related purchases. Residents tended to spend significantly more, per angler, on boat purchases, boat accessories, and boat storage in all of the Northeast states except in Maine. Non-resident anglers fishing in Maine were estimated to spend more for boats and boating related items in Maine, on average, than residents of Maine.

Total resident expenditures on trip-related items exceeded the amount spent by non-residents in 6 of the 10 Northeast coastal states (CT, MD, NH, NJ, NY, and VA), even though mean daily expenses in those states were generally higher for non-residents (2<sup>nd</sup> Table for each state). This occurred because residents of those six states fished many more days than non-residents in 2006. Resident anglers in the remaining four Northeast states (DE, ME, MA, and RI) also fished more days than non-residents, but mean daily resident expenditures were considerably lower so total non-resident trip expenditures exceeded resident expenditures in those states.

In terms of total expenditures on fishing equipment and durable goods in 2006, resident anglers spent more than non-residents in 8 of the 10 Northeast coastal states. Non-residents fishing in Maine and Rhode Island spent more, in total, than their resident counterparts due mainly to higher boating and fishing vehicle expenditures in those states.

Across all of the Northeast coastal states, anglers fishing in New Jersey, Maryland, Virginia, Massachusetts, and New York exhibited the highest total expenditures in 2006 (i.e., the sum of trip, fishing equipment, and durable good purchases). Anglers fishing in these states spent between \$769 million and \$1.4 billion on marine recreational fishing in 2006. Total resident expenditures exceeded the amount spent by non-residents in all of the Northeast states except in Maine and Rhode Island.

### **Economic Impacts**

Overall, the highest sales, value-added, income, and employment impacts were generated by angler expenditures in New Jersey (Table 63). The \$1.4 billion spent on retail good and services by anglers in New Jersey in 2006 generated \$1.6 billion in total sales within the state, \$830 million in value-added, \$523 million in income, and supported 9,814 jobs. New Jersey was followed by Maryland, New York, Massachusetts, and Virginia in generating sales, value-added, income, and employment.

A substantial portion of the items purchased by anglers, however, was imported into each state. As a result, many of the angler dollars spent in each coastal state impacted the economies of other states and countries. The amount lost to other regions can be calculated from the difference between the total expenditures and the direct sales impacts in the third and fourth table for each state. For instance, of the \$1.4 billion spent by anglers on all goods and services in New Jersey, only \$951 million (68%) directly affected the New Jersey economy (Table 63); \$441.5 million in goods and services were imported into the state in response to angler demands. Thus, on average, about 32 cents of every dollar spent by anglers in New Jersey leaves the state. This is the lowest

level of import requirements for any Northeast coastal state. Across all Northeast coastal states, the level of import requirements ranged from a low of 32 cents for every angler dollar spent in New Jersey to a high of 45 cents in Virginia.

Resident impacts were higher than those of non-residents in all of the Northeast coastal states except in Maine, Rhode Island, and Delaware. In Maine and Rhode Island, expenditures by non-residents generated the highest sales, value-added, income, and employment impacts (Tables 27 and 81). In Delaware, resident expenditures generated the highest sales, value-added, and income impacts, but non-resident expenditures generated about 40 more jobs than resident expenditures (Table 18). This is mostly due to the nature of non-resident expenditures in Delaware. Non-resident anglers in Delaware spent a substantial amount of money at restaurants, for groceries, charter fees, and for overnight lodging at hotels. The businesses that support these expenditures are highly labor intensive which translates into considerable employment impacts within the state of Delaware.

The most important expense categories in terms of generating impacts varied considerably by state (4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, and 7<sup>th</sup> tables shown for each state). The highest sales impacts were generated by purchases of used vehicles (CT), new vehicles (DE), lodging fees (ME and MA), new homes (MD), rods and reels (NH and RI), boat storage fees (NJ and NY), and new boats (VA). The highest value-added impacts were generated by the same expenditure categories in all of the Northeast states, except in New Hampshire and Rhode Island, where charter fees and private transportation costs produced more value-added effects. Additionally, the same expenditure categories that generated the highest sales impacts in each Northeast coastal state also created the highest income impacts in each state, except in New York, where second home maintenance costs produced the greatest income impacts. Lastly, in terms of total state-level employment generated from angler purchases, the most important expense categories were used vehicles (CT), food from restaurants (DE and RI), lodging fees (ME and MA), new homes (MD), charter fees (NH), rods and reels (NJ), second home maintenance (NY), and new boats (VA).

The impacts created by anglers fishing from private boats and from the shore were higher than those produced by party/charter boat fishing in all of the coastal states except New Hampshire (8<sup>th</sup> table shown for each state). In Maine, Maryland, Massachusetts and Rhode Island, shore mode impacts were higher than the private/rental boat mode. The sales, income, value-added, and employment impacts created by party/charter boat fishing and private/rental boat fishing were the highest in New Jersey, while the impacts generated from shore fishing were the highest in Massachusetts. Overall, angler trip expenditures in New Jersey generated more sales, income, value-added, and employment impacts than any other coastal state.

Federal taxes generated by angler purchases ranged from \$5 million in New Hampshire to \$141 million in New Jersey (9<sup>th</sup> table shown for each state). Revenue received by state/local governments varied from \$3 million in New Hampshire to a high of \$100 million in New Jersey. In total, angler expenditures in New Jersey generated the highest tax revenues of all the coastal states (\$242 million).

## **Southeast Region**

### **Expenditures**

Daily mean trip expenditures were generally higher for non-residents than residents in all of the Southeast coastal states (1<sup>st</sup> table shown for each state). Non-resident anglers tended to travel further and were more inclined to take overnight fishing trips, requiring the use of lodging facilities. Resident anglers in Georgia fishing aboard for-hire boats, resident anglers in Georgia and Mississippi fishing from private/rental boats, and resident anglers in Louisiana fishing from shore were the only groups of resident anglers to incur higher mean trip expenditures than their non-resident counterparts. The highest single mean trip expense for resident anglers in all of the Southeast coastal states was charter fees. The highest mean trip expense for non-residents was also charter fees in every state except in South Carolina and Georgia where mean lodging fees and private transportation costs, respectively, exceeded all other trip expenditures.

In contrast to average daily trip expenditures, resident anglers in every state spent considerably more on fishing equipment and durable items in 2006, per angler, than out-of-state anglers. The largest difference in durable expenditures across the two groups of anglers was generally for boat-related purchases. Residents tended to spend significantly more, per angler, on boat purchases, boat accessories, and boat storage in all of the Southeast states.

Total resident expenditures on trip-related items exceeded the amount spent by non-residents in 4 of the 8 Southeast coastal states (GA, LA, MS, and TX), even though mean daily expenses in those states were generally higher for non-residents (2<sup>nd</sup> table shown for each state). This occurred because residents of those four states fished many more days than non-residents in 2006. Resident anglers in the remaining four Southeast states (AL, FL, NC, and SC) also fished more days than non-residents, but mean daily resident expenditures were considerably lower so total non-resident trip expenditures exceeded resident expenditures in those states. In terms of total expenditures for fishing equipment and durable goods in 2006, resident anglers spent more than non-residents in all of the Southeast coastal states.

Across all of the Southeast coastal states, anglers fishing in Florida, Texas, Louisiana, and North Carolina exhibited the highest total expenditures in 2006 (i.e., the sum of trip, fishing equipment, and durable good purchases). Anglers fishing in those states spent between \$2.0 billion and \$16.7 billion on marine recreational fishing in 2006. Total resident expenditures exceeded the amount spent by non-residents in all of the Southeast states.

### **Economic Impacts**

Overall, the highest sales, value-added, income, and employment impacts were generated by angler expenditures in Florida (Table 125). The \$16.7 billion spent on retail good and services by anglers in Florida in 2006 generated \$14.2 billion in total sales that remained within the state, \$7.6 billion in value-added, \$2.1 billion in income, and supported 55,643 jobs. Florida was

followed by Texas, North Carolina, and Louisiana in generating sales, value-added, income, and employment.

A substantial portion of the items purchased by anglers, however, was imported into each state. As a result, many of the angler dollars spent in each coastal state impacted the economies of other states and countries. The amount lost to other regions can be calculated from the difference between the total expenditures and the direct sales impacts in the third and fourth table for each state. For instance, of the \$3.2 billion spent by anglers on all goods and services in Texas, about \$2.3 billion (72%) directly affected the Texas economy (Table 179); \$887.4 million in goods and services were imported into the state in response to angler demands. Thus, on average, about 28 cents of every dollar spent by anglers in Texas leaves the state. This is the lowest level of import requirements for any Southeast coastal state. Across all Southeast coastal states, the level of import requirements ranged from a low of 28 cents for every angler dollar spent in Texas to a high of 52 cents in Florida.

Resident impacts were higher than those of non-residents in all of the Southeast coastal states except in North Carolina (3<sup>rd</sup> table shown for each state). In North Carolina, expenditures by non-residents generated the highest sales, value-added, income, and employment impacts even though resident expenditures were approximately \$66.4 million higher than non-residents (Table 161). This is because non-resident anglers in North Carolina spent considerably more than residents at service-oriented businesses within the state, such as restaurants, supermarkets, convenience stores, hotels, and for-hire fishing boats. Service-oriented businesses tend to generate higher economic impacts within a region than commodity-level purchases (i.e., fishing tackle purchases) because the entire demand for the services is supplied by local businesses. Whereas, commodity-level purchases usually require some level of imports to meet consumer demand. For instance, in North Carolina, of the \$86.4 million spent by anglers on fishing tackle in 2006, only about \$46.9 million was supplied by manufacturers within the state (Table 161). Approximately \$39.5 (46%) million was imported into the state to meet angler demands.

The most important expense categories in terms of generating impacts varied somewhat by state (4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, and 7<sup>th</sup> tables shown for each state). The highest sales impacts were generated by purchases of new boats (AL, FL, LA, and SC), boat storage (GA), vehicle maintenance (MS), and new homes (NC and TX). The highest value-added impacts were generated by the same expenditure categories in all of the Southeast states, except in Georgia and North Carolina, where new boat purchases and lodging costs produced more value-added effects. Additionally, the same expenditure categories that generated the highest sales impacts in each Southeast coastal state also created the highest income impacts in each state, except in Georgia, where new boat purchases produced the greatest income impacts. Lastly, in terms of total state-level employment generated from angler purchases, the most important expense categories were new boats (AL, FL, GA, LA, and SC), vehicle maintenance (MS), lodging fees (NC), and new homes (TX).

The impacts created by anglers fishing from private boats and from the shore were higher than those produced by party/charter boat fishing in all of the coastal states (8<sup>th</sup> table shown for each state). In South Carolina, North Carolina, and Alabama shore mode impacts were higher than private/rental boat mode. The sales, income, and employment impacts created by party/charter boat fishing and private/rental boat fishing were the highest in Florida, while the impacts

generated from shore fishing were the highest in North Carolina. Overall, angler trip expenditures in Florida generated more sales, income, and employment impacts than any other coastal state.

Federal taxes generated by angler purchases ranged from \$15 million in Georgia to \$1.2 billion in Florida (9<sup>th</sup> table shown for each state). Revenue received by state/local governments varied from \$11 million in Georgia to a high of \$867 million in Florida. In total, angler expenditures in Florida generated the highest tax revenues of all the coastal states (\$2.1 billion).

## **Pacific Coast and North Pacific Regions**

### **Expenditures**

Daily mean trip expenditures were generally higher for non-residents than residents in the Pacific and North Pacific coastal states (1<sup>st</sup> table shown for each state). Non-resident anglers tended to have higher travel expenses and were more inclined to take overnight fishing trips, requiring the use of lodging facilities. However, resident anglers in California fishing from private/rental boats, resident anglers in Washington fishing aboard party/charter boats, and shore anglers residing in California and Oregon incurred higher mean trip expenditures than their non-resident counterparts. The highest single mean trip expense for resident anglers in all of the Pacific coastal states was charter fees. The highest mean trip expense for non-residents fishing in the Pacific states was also charter fees.

In terms of average expenditures on fishing equipment and durable items in 2006, non-residents spent more per angler in California and Oregon, and residents of Washington and Alaska spent considerably more on average than their non-resident counterparts. In California, maintenance costs for second homes was the primary driver behind higher average non-resident expenditures, and in Oregon the difference was mainly due to higher average expenditures for new vehicles purchased for fishing. In Washington and Alaska, where average resident expenditures were a great deal larger than non-resident outlays, the largest differences in average expenditures across the two groups of anglers was for new boats and vehicles.

Total resident expenditures on trip-related items exceeded the amount spent by non-residents in 3 of the 4 Pacific and North Pacific coastal states (CA, OR, and WA), even though mean daily expenses were generally higher for non-residents in those states, except in California (2<sup>nd</sup> Table for each state). This occurred because residents of those three states fished many more days than non-residents in 2006. In Alaska, non-resident anglers fished nearly as many days as resident anglers in 2006, and since their mean daily expenditures were so much higher total non-resident trip expenditures exceeded resident expenditures in Alaska.

In terms of total expenditures on fishing equipment and durable goods in 2006, resident anglers spent more than non-residents in all of the Pacific and North Pacific coastal states even though average expenditures, per angler, were higher for non-residents in California and Oregon. This occurred because resident participation was higher than non-resident participation in California and Oregon in 2006.

Across all of the Pacific and North Pacific coastal states, anglers fishing in California exhibited the highest total expenditures in 2006 (i.e., the sum of trip, fishing equipment, and durable good purchases). Anglers fishing in California spent an estimated \$3.0 billion on marine recreational fishing in 2006 (Table 196). Total resident expenditures exceeded the amount spent by non-residents in all of the Pacific and North Pacific coastal states except in Alaska.

### **Economic Impacts**

Overall, the highest sales, value-added, income, and employment impacts were generated by angler expenditures in California (Table 188). The \$3.0 billion spent on retail good and services by anglers in California in 2006 generated \$3.7 billion in total sales within the state, \$1.9 billion in value-added, \$1.3 billion in income, and supported 23,454 jobs. California was followed by Washington, Alaska, and Oregon in generating sales, value-added, income, and employment.

A substantial portion of the items purchased by anglers, however, was imported into each state. As a result, many of the angler dollars spent in each coastal state impacted the economies of other states and countries. The amount lost to other regions can be calculated from the difference between the total expenditures and the direct sales impacts in the third and fourth table for each state. For instance, of the \$3.0 billion spent by anglers on all goods and services in California, only \$2.0 billion (67%) directly affected the California economy (Table 188); \$1.0 billion in goods and services were imported into the state in response to angler demands. Thus, on average, about 33 cents of every dollar spent by anglers in California leaves the state. This is the lowest level of import requirements for any Pacific coastal state. Across all Pacific and North Pacific coastal states, the level of import requirements ranged from a low of 33 cents for every angler dollar spent in California to a high of 51 cents in Washington.

Resident impacts were higher than those of non-residents in all of the Pacific and North Pacific coastal states except in Alaska (3<sup>rd</sup> table shown for each state). In Alaska, expenditures by non-residents generated the highest sales, value-added, income, and employment impacts (Table 215).

The most important expense categories in terms of generating impacts varied across each state (4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, and 7<sup>th</sup> tables shown for each state). The highest sales impacts were generated from charter fees (AK), rods and reels (CA), new vehicles (OR), and new boats (WA). The highest value-added impacts were generated by the same expenditure categories in Alaska and Washington. In California, boat insurance generated the highest value-added impacts, and in Oregon license fees produced the single highest value-added impacts. The highest income impacts were generated by license fees (AK and OR), rods and reels (CA), and new boats (WA). Lastly, in terms of total state-level employment generated from angler purchases, the most important expense categories were charter fees (AK), rods and reels (CA), license fees (OR), and new boats (WA).

The impacts created by anglers fishing from party/charter boats were higher than those produced by anglers fishing from the shore or from private/rental boats in Alaska and California (Tables

220 and 193). Private/rental boat fishing generated more impacts in Oregon than the other two modes of fishing and, in Washington, anglers fishing from the shore generated the highest level of impacts (Tables 202 and 211). The sales, income, value-added, and employment impacts created by party/charter boat fishing were the highest in Alaska, while the sales, value-added, and income impacts from private/rental boat fishing were the highest in California. Anglers fishing from private/rental boats in Alaska generated more employment than the other three Pacific and North Pacific coastal states. As for shore fishing effects, angler expenditures in California produced the highest sales, value-added, income, and employment impacts in the Pacific. Overall, angler trip expenditures in California generated more sales, income, and value-added impacts than the other coastal states, and the highest employment effects occurred in Alaska.

Federal taxes generated by angler purchases ranged from \$24 million in Oregon to \$317 million in California (9<sup>th</sup> table shown for each state). Revenue received by state/local governments varied from \$17 million in Oregon to a high of \$216 million in California. In total, angler expenditures in California generated the highest tax revenues of all the coastal states (\$534 million).

## **Hawaii**

### **Expenditures**

Daily mean trip expenditures were much higher for non-residents visiting Hawaii than for residents (Table 222). Non-resident anglers tended to travel further, use more public transportation, and were more inclined to require the use of lodging facilities. The highest single mean trip expense for resident anglers was boat fuel and the highest mean trip expense for non-residents was charter fees. Non-residents also spent a considerable amount on gifts and souvenirs, per angler, in Hawaii.

In contrast to anglers' expenditures in most other coastal states in the U.S., non-residents fishing in Hawaii spent more on fishing equipment and durable items in 2006, per angler, than residents. This is mainly due to higher average non-resident expenditures for license fees, camping equipment, boat accessories, and vehicle maintenance. Residents of Hawaii spent more, on average, for rods and reels, new vehicle purchases, and new home purchases.

Total resident expenditures on trip-related items exceeded the amount spent by non-residents in Hawaii, even though mean daily expenses were considerably higher for non-residents (Table 223). This occurred because residents of Hawaii fished many more days than non-residents in 2006. In terms of total expenditures on fishing equipment and durable goods in 2006, non-resident anglers spent more than residents of Hawaii. The sum of the trip, fishing equipment, and durable good purchases in Hawaii in 2006 equaled \$755.9 million.



## **Economic Impacts**

The \$755.9 million spent on retail goods and services by anglers in Hawaii in 2006 generated \$772.8 million in total sales within the state, \$380.6 million in value-added, \$253.6 million in income, and supported 7,023 jobs (Table 224).

A substantial portion of the items purchased by anglers, however, was imported into Hawaii. As a result, many of the angler dollars spent in Hawaii impacted the economies of other states and countries. The amount lost to other regions can be calculated from the difference between the total expenditures and the direct sales impacts in Tables 224 and 225. For example, of the \$755.9 million spent by anglers on all goods and services in Hawaii, only \$475.5 million (63%) directly affected the Hawaii economy; \$280.3 million in goods and services were imported into the state in response to angler demands. Thus, on average, about 37 cents of every dollar spent by anglers in Hawaii leaves the state.

The economic impacts generated by resident and non-resident anglers in Hawaii were similar across the two groups of anglers in 2006. Expenditures by out-of-state anglers generated slightly more value-added, income, and employment in Hawaii than resident anglers in 2006, while resident expenditures generated more sales than non-resident outlays (Table 224).

The most important expense categories in terms of generating impacts were vehicle maintenance and rods and reels (Tables 225-228). The highest sales impacts were generated by purchases of rods and reels, and the highest value-added, income, and employment effects were created from expenditures for vehicle maintenance.

The impacts created by anglers fishing from shore were higher than those produced by party/charter boat fishing or private/rental fishing (Table 229). Lastly, Federal taxes generated by angler purchases amounted to \$56.2 million and the revenue received by state/local governments was \$48.6 million in 2006 (Table 230). In total, angler expenditures in Hawaii generated \$105.0 million in tax revenue in 2006.

## **U.S.**

### **Expenditures**

U.S. total expenditures, including trip and durable good expenditures were \$31.4 billion in 2006 (Table 231). Trip expenditures accounted for \$5.8 billion and durable good purchases made up \$25.6 billion of that total. The single largest trip expenditure in the U.S. was private transportation expenses at \$1.2 billion (Table 231). The single largest durable equipment expenditure was new boat purchases at \$6.8 billion.

The top five coastal states in terms of total expenditures were: Florida (\$16.7 billion), Texas (\$3.2 billion), California (\$3.0 billion), Louisiana (\$2.9 billion), and North Carolina (\$2.0 billion). As with the U.S. totals, durable good purchases drive the state totals as well. The top five coastal states in terms of durable good expenditures were: Florida (\$15.4 billion), California

(\$2.7 billion), Louisiana (\$2.6 billion), Texas (\$2.3 billion), and North Carolina (\$1.3 billion). The highest total trip expenditures were found in Florida (\$1.3 billion), Texas (\$915 million), North Carolina (\$709 million), New Jersey (\$358 million), and California (\$334 million).

## **Economic Impacts**

Saltwater angler expenditures in the U.S. generated \$82.3 billion in total sales, \$38 billion in value-added, \$24.0 billion in income, and supported 533,813 jobs (Table 232). Durable expenditures generated \$68.7 billion in total sales, \$31 billion in value-added, \$19.9 billion in income, and supported 425,217 jobs (Tables 233-236). Trip expenditures in the U.S. produced \$13.6 billion in total sales, \$7.1 billion in value-added, \$4.1 billion in income, and supported 108,596 jobs. To place the study results in context relative to the total income and employment generated in the U.S. in 2006, marine recreational fishing expenditures accounted for less than 0.5% of the total sales, 0.3% of total employment, 0.3% of total income, and 0.4% of total value-added existing in the nation.

Overall, U.S. fishermen spent over \$31 billion, but only about \$28 million remained in the country (89%); \$3.4 million in goods and services were imported into the U.S. in response to angler demands (Table 232). The most important durable good purchase, in terms of economic impacts generated in the country, was new boats (Tables 233-236). The most important trip impact category was private transportation (i.e., auto fuel). Lodging expenses also generated substantial economic impacts across the country.

Shore mode fishing in the U.S. generated the highest total sales, value-added, income, and employment followed by private/rental boaters and anglers fishing aboard party/charter boats (Table 237). Approximately \$6.0 billion in federal taxes and about \$4.0 billion in total state taxes was generated from saltwater angler expenditures in the U.S. in 2006 (Table 238).

## **Statistical Tests**

### **Non-Response**

To examine statistical differences between respondents and non-respondents, the demographic characteristics, fishing expenditures, and avidity of the mail survey participants were compared to the non-respondents that were successfully re-contacted by telephone. Differences in the continuous variables between respondents and non-respondents were tested using a Wald test in the Proc Surveyreg procedure in SAS (SAS 2000). For categorical variables both the Rao-Scott and Wald chi-squared tests were used in the Proc Surveyfreq procedure in SAS (SAS 2000). These procedures and tests were selected because they can be applied to weighted data, as was used in this study. The null hypothesis for the tests was no difference in means across the treatment variables.

No significant differences in means were found for the three expenditure categories that were compared across respondents and non-respondents (Table 5). The tests were generally

inconclusive across the demographic variables. No significant differences were found for age, ethnicity (under both the Rao-Scott and Wald test), gender (under both tests), and employment (under the Wald test). However, the null hypothesis of no difference in means between respondents and non-respondents was rejected for the variables education, income, and race under both the Rao-Scott and Wald test. The null hypothesis was also rejected for employment when using the Rao-Scott test and for 12-month avidity. It is difficult to draw much insight into these differences for a number of reasons. Language barriers may have limited minority participation in the non-response telephone survey since it was conducted only in English. Results indicate that fewer races besides white were represented among those that completed the non-response telephone survey. Race, education, and income also tend to be correlated so this may have introduced bias into the non-response telephone survey results. Further, in contrast to our expectations, participants in the mail survey had a mean 12-month avidity of 1.92 trips while the non-response telephone survey participants had a mean 12-month avidity of 4.95 trips. We expected that more avid anglers would generally be more likely to respond to the initial mail survey. In the end, because all of the durable expenditure responses that we tested were not statistically different, no additional weighting was undertaken.

### **Survey Mode Differences**

Statistical differences between expenditures and demographics collected through the mail versus those collected over the telephone in Florida were examined using the same Rao-Scott and Wald chi-squared tests described above. Of the 30 expenditure and demographic variables tested, 21 failed to reject the null of no significant difference in means with the results the same regardless of the categorical variable test used (Table 6). The expenditure categories found to be significantly different included: fishing gear (higher on phone), second home insurance (lower on phone), second home repair (lower on phone), vehicle purchase (higher on phone), and binocular purchase (higher on phone). For the demographic variables, 12-month avidity (lower on phone), education (higher on phone), ethnicity (Hispanic sample low on phone), and race (almost no non-white sample on phone) were statistically different.

While the test results showed no significant difference in means for the majority of the expenditure and demographic variables, the results are not definitive. Statistical difference tests perform more accurately with comparable sample sizes. While the mail survey in Florida met with a 53.4% success rate, the telephone survey met with a 5.1% success rate primarily due to bad telephone numbers collected during the intercept phase or initial refusal of the telephone number question during the field portion of the survey. A phone number look-up survey was used but little success was met. Interestingly, respondents were far more likely to supply a working mailing address. The resulting disparate sample sizes may have had an influence on the outcome of the statistical significance tests. The same holds true for the race variable where, as expected, the proportion of non-whites in the telephone sample was considerably lower than that contained in the mail survey sample.