

**A DATABASE OF
SPORT FISHING VALUES**

Prepared for:

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The Division of Economics of the U.S. Department of the Interior, Fish and Wildlife Service (FWS) is responsible for undertaking economic analyses in support of FWS programs, and for providing technical and economic assistance and guidance to the FWS Regional and Washington offices. For example, the Division undertakes economic analyses of the effects of critical habitat designations, provides technical support in the conduct of natural resource damage assessments, and estimates the socioeconomic impacts of land acquisition to establish or enlarge National Wildlife Refuges. These efforts typically involve review of the relevant economics literature for recreation and ecological values. Because these analyses often involve assessing the economic effects of changes in the quality or availability of aquatic resources, the Division is particularly interested in improving the efficacy of, and consistency in, their analyses involving the economic valuation of sport fishing opportunities. As a result, FWS has developed a recreational fishing valuation database, which provides information on numerous studies from the large body of economic literature of sport fishing values.

The database of recreational fishing valuation studies provides the FWS with a detailed account of the contents of numerous recent travel cost and contingent valuation studies. Included in the database is welfare estimate information from 109 travel cost and contingent valuation studies of sport fishing values conducted from 1975 through 1996. To the extent possible, the database describes the resource and the resource change that provide the basis for these welfare estimates; including species and resource quality characteristics. In addition, for each of the reported estimates, the database describes the associated study characteristics (including respondent sample information), valuation methodology, and other study characteristics.

To develop this database, we conducted an extensive review of the available literature on the economic valuation of sport fishing resources across the U.S. The resultant database of studies has a wide geographic coverage, including numerous studies describing sport fishing values in the northeastern (FWS Region 5) and western states (FWS Region 1). To a lesser extent, the database reports values for sport fishing opportunities in the midwestern states (i.e., where FWS Regions 2, 3, 4, and 6 are located) and Hawaii.

The remainder of this report discusses the database in detail. Chapter 2 presents a description of the database, including database contents and database field definitions. Appendix A discusses the database structure. Appendix B provides a copy of the coding sheet used in constructing the database.

INTRODUCTION

Through an in-depth review of numerous sport fishing valuation studies, the database of sport fishing values provides a consistent recording of study characteristics, including welfare estimate, valued resource, water type, survey method, sample frame, and valuation methodology. Database users can obtain detailed information from these recreational fishing valuation studies to learn about the characteristics of a particular study or to compare information across studies (e.g., benefit estimation techniques, sampling procedures).

This chapter first discusses the criteria we used to select studies for inclusion in the database. The next section describes the database contents, including the coding protocol used to record information from each of the studies and a summary of the database contents. The last section presents a brief summary of the database structure, the full details of which are provided in Appendix A.

STUDY SELECTION

In developing this database, we selected studies that provide direct-use value estimates. Because non-market valuation studies were not very common in the 1960s and early 1970s, we focused on all travel cost and contingent valuation studies published after 1975, searching both the peer reviewed (journals, dissertations, theses) and gray literature (working papers, contract documents, unpublished texts). In the vast majority of cases, authors of the gray literature studies also published their studies in the peer reviewed literature. Having studies with both project reports (i.e., gray literature) and journal articles provides a richer source of information for coding study characteristics in the database than relying on only one form of published material.

Several sources provided extensive reference lists of the sport fishing valuation literature:

- Earlier surveys of the literature include Walsh, Johnson, and McKean (1988) and Smith and Kaoru (1990).

- Several more recent reference lists provided relevant citations, including Natural Resource Damage Assessment, Incorporated (1994), Ward (1995), and Parsons and Hauber (1996).
- We relied on bibliographic information from the Department of Resource Economics and Policy at the University of Maine, Orono and the Department of Agricultural and Resource Economics at Colorado State University.
- We also utilized an on-line literature search of the economic, social science, and academic literature, and the library of Industrial Economics, Incorporated.

Our collection efforts resulted in citation information on over 250 sport fishing studies.

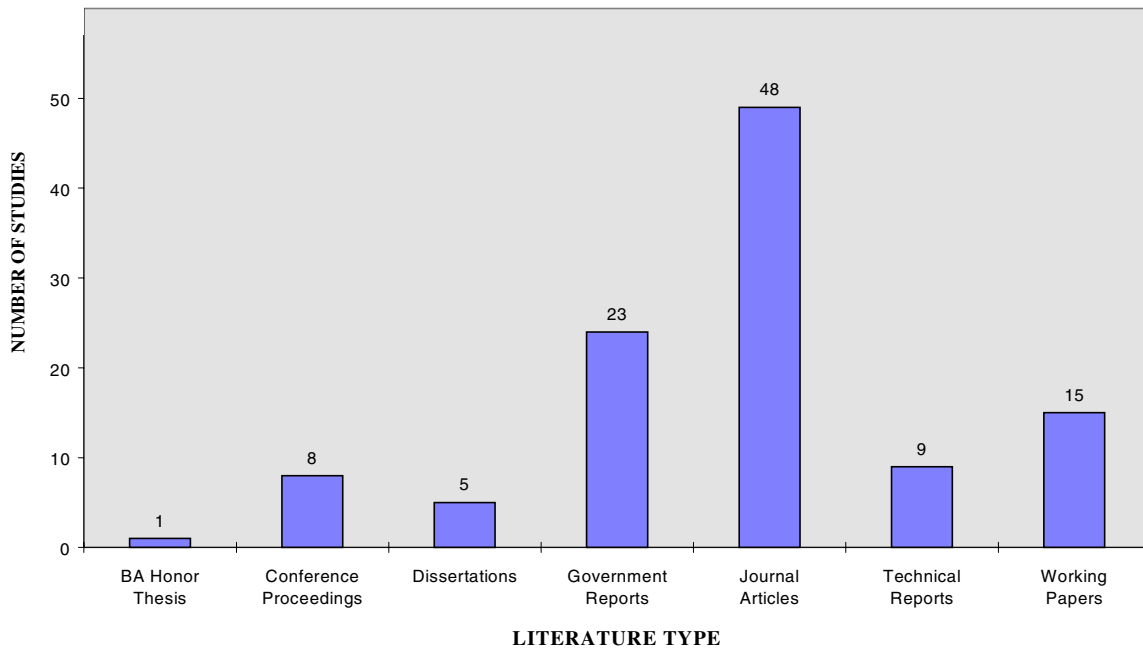
The database ultimately resulted in a collection of detailed information on 109 of the identified studies noted above. To arrive at this study sample:

- We attempted to gather as many of the 250 studies as possible, and aimed to cut off active collection efforts at 150 studies due to resource limitations. Our literature search resulted in an enumeration and collection of 161 studies. The studies we did not have the resources to collect include journal articles, gray literature and difficult-to-find documents.
- Of these 161 collected studies, the database records citation information on the 124 that provide use value estimates for sport fishing opportunities in the U.S. We exclude studies from the database that provide values for several recreational activities simultaneously (e.g., studies that provide total recreational values including, for example, swimming, boating, and fishing values). We also exclude those studies providing only aggregate (i.e., population) welfare estimates unless the study provides sufficient information to convert these values to individual (i.e., per person) welfare estimates. Finally, we exclude purely theoretical studies from the database.
- The database records detailed study and sample information for welfare estimates from 109 of these 124 studies. The studies for which the database only provides citation information are publications that duplicate other studies in the database (e.g., a working paper that provides duplicate results to a journal published paper).

Each of these 109 studies provides estimates of recreational fishing values. Nearly half of the 109 recorded studies are from peer reviewed journals; several are government reports, working papers, and technical reports. Exhibit 2-1 shows the distribution of the database studies by literature type.

Exhibit 2-1

DISTRIBUTION OF STUDIES BY LITERATURE TYPE



The studies characterized in the database cover a wide range of species and fisheries across the U.S. The prevalent target species valued include salmon, trout, pike, bass, walleye, and mackerel. Respondent fishing modes include shore fishing, private and charter boat fishing, and fly fishing. The database also includes numerous consumer surplus values for a fishing trip, day, and year and consumer surplus estimates for marginal changes in fishing quality.¹ In addition, estimated values include consumer surplus values per fish caught, per season, and per choice occasion.

The studies included in the database and the data used in these studies are, on average, approximately ten years old. The studies were authored or published between 1978 and 1996, while the collection dates of the data used in these studies ranged from 1971 to 1994. The data for nearly half of the studies came from the 1985 to 1989 time period. Exhibit 2-2 shows the distribution of studies by year of authorship or publication. Exhibit 2-3 shows the distribution of studies by year of data collection; in cases of time series studies, this exhibit reflects the year that data collection began.

¹ A total consumer surplus value refers to an estimate deriving from a complete loss of the fishing resource. A marginal consumer surplus value refers to an estimate deriving from an incremental change in fishing conditions (e.g., 50 percent decrease in catch rate).

Exhibit 2-2

DISTRIBUTION OF STUDIES BY YEAR OF AUTHORSHIP OR PUBLICATION

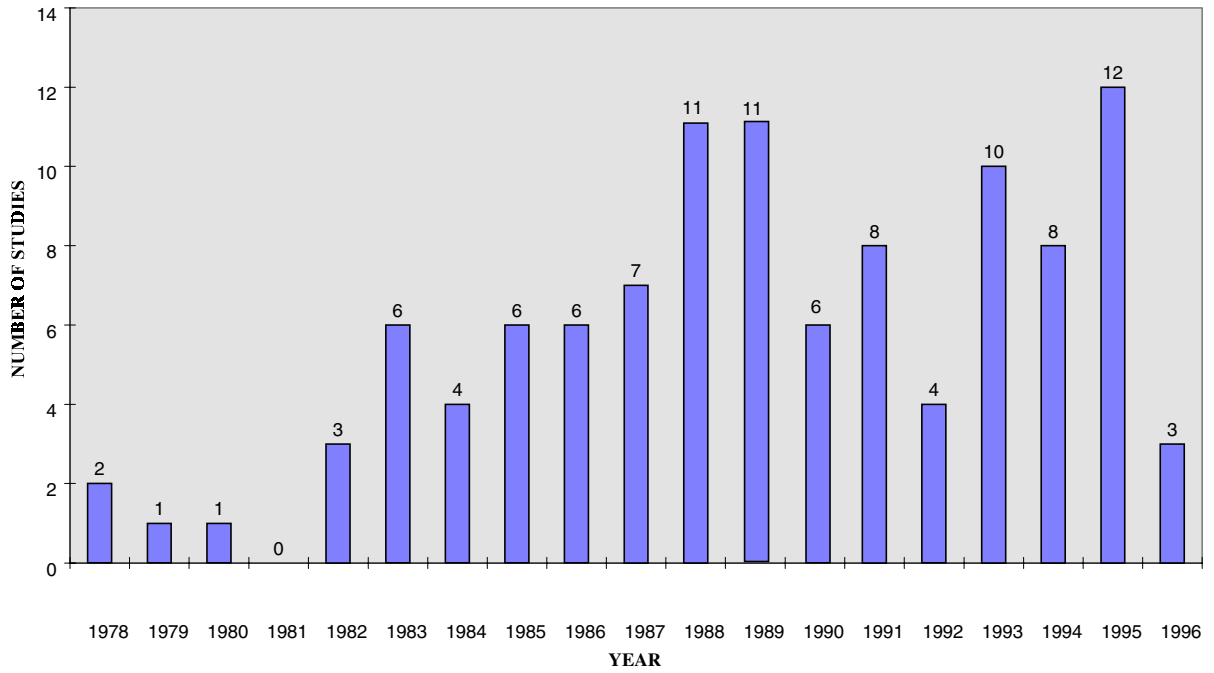
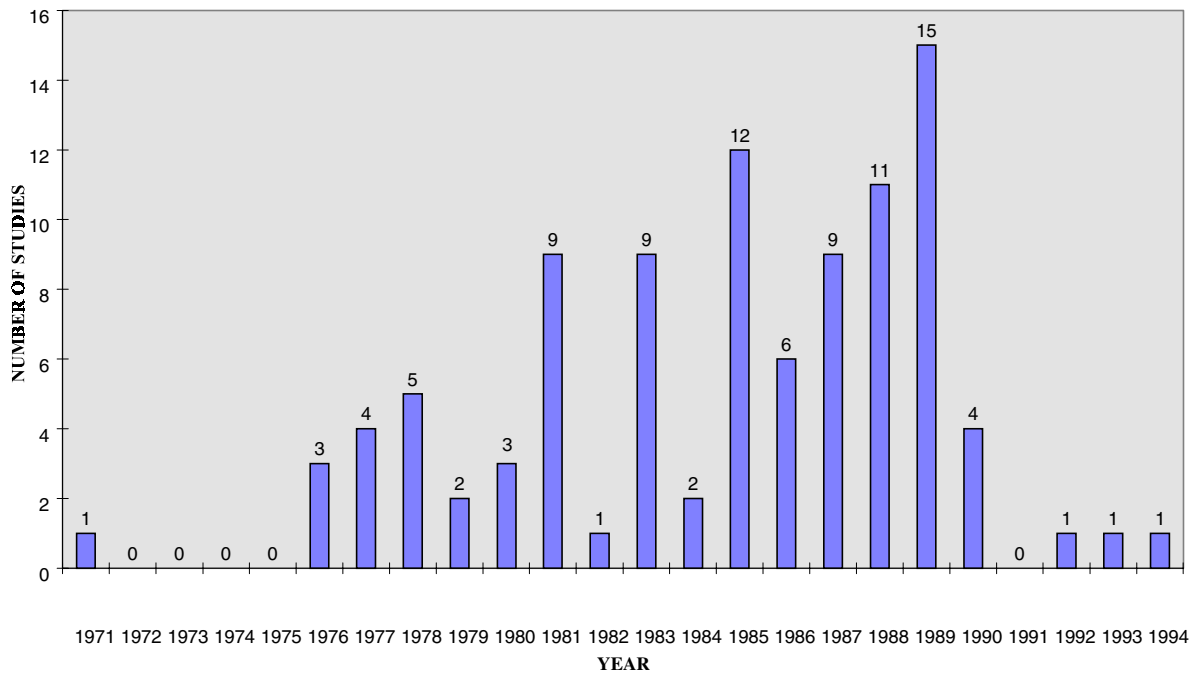


Exhibit 2-3

DISTRIBUTION OF STUDIES BY YEAR OF DATA COLLECTION*



* Ten studies do not report date of data collection.

The database includes sport fishing value estimates for study locations that are well-distributed across the U.S. and within each of the FWS regions. California sport fishing studies are the most common. In addition, a large number of studies value fishing opportunities in Oregon, Montana, Wisconsin, New York, Maine, and Florida. Exhibit 2-4 shows the geographic distribution of the studies included in the database.

The geographic distribution of prevalent target species covered in the database is shown in Exhibit 2-4. Nearly every state has a study that values trout and bass fishing. New England and northwest Pacific studies provide value estimates for salmon fishing. Mackerel studies exist for saltwater states of South Carolina, Florida, Louisiana, and California. Walleye studies are concentrated around the Great Lakes region in Minnesota, Wisconsin, Ohio, and New York.

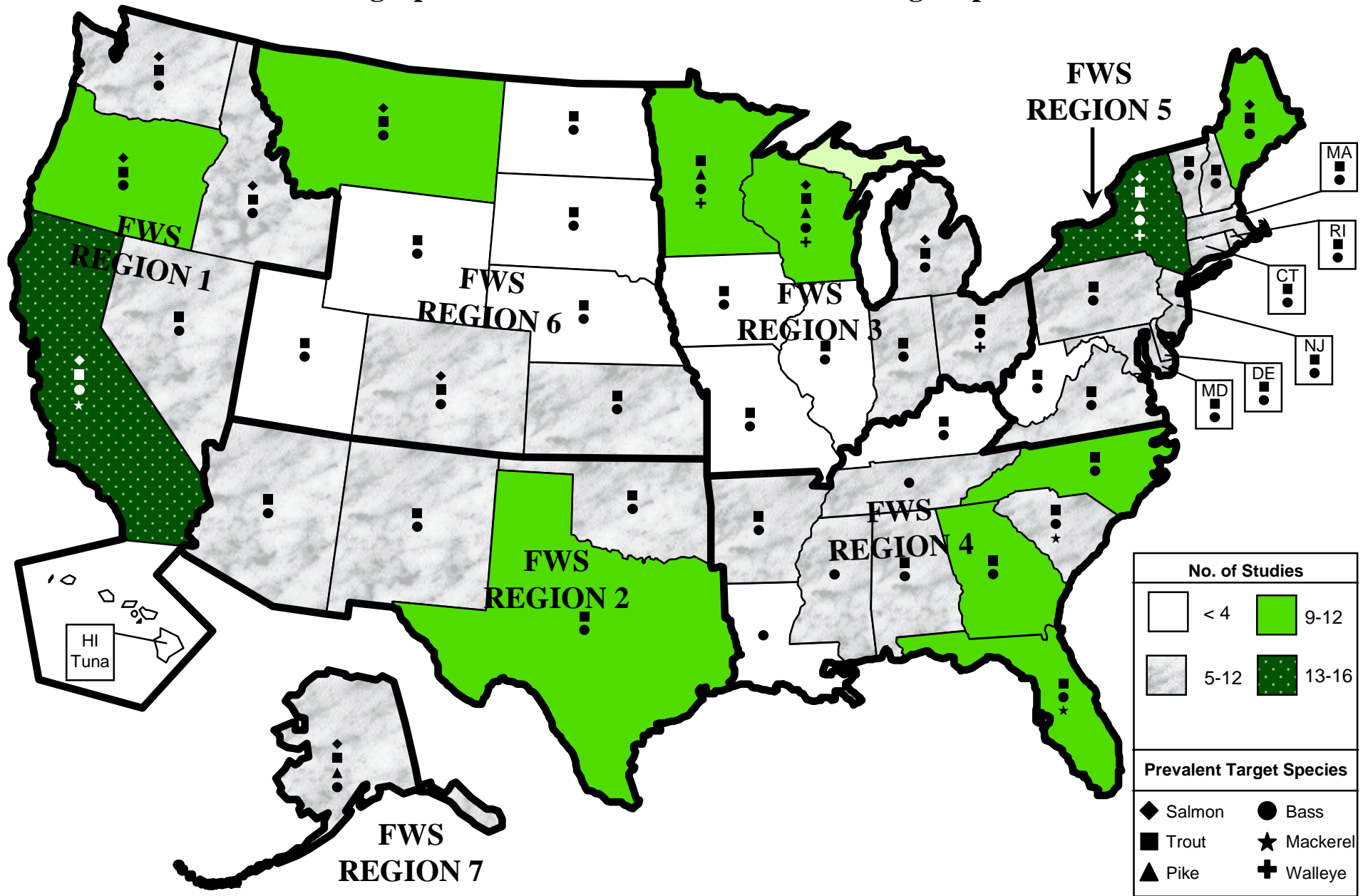
DATABASE CONTENTS

Many of the 109 studies in the database report more than one welfare estimate of consumer surplus. Authors may conduct sensitivity analyses associated with various models or model specifications, estimate values for a variety of resource conditions (e.g., increase in catch rate, lifting of fishing restrictions, decrease in fishing population), or provide results that combine the above two approaches. For example, a study may provide many welfare estimates because:

- Each estimate corresponds to a particular model. An author may develop different models in order to estimate values for different fishing conditions (e.g., doubling the catch rate, halving the catch rate, eliminating the species). Alternatively, a study may develop two methodologically distinct models to compare welfare estimates for the same change in fishing conditions (e.g., one travel cost estimate, the other contingent valuation).
- Each estimate corresponds to a particular model specification. A study may utilize several functional forms to examine the sensitivity of the estimates to various specifications (e.g., linear, loglinear).
- Each estimate is a variant of the other resulting from the exact same model. A study may utilize fishing frequency data (days per trip, days per season) to transform a per-trip welfare estimate result and also report the resulting per-day, per-season or per-year welfare estimate. Each of these welfare estimates would be associated with the same change in fishing conditions and the same model.

To clearly describe how the estimates of a study differ, the database contains a single text field associated with the bibliographic citation that summarizes all welfare estimates reported in each study.

Exhibit 2-4
Geographical Distribution of Studies and Target Species



We apply a protocol for coding the welfare estimate information. First, this coding protocol ensures that the database does not record a model that the author provides only for comparative purposes or deems “unreliable” (e.g., an author may state that the contingent valuation survey results are shown only as a basis for comparison with the travel cost analysis results). When an author does not make a statement about the reliability of one of the estimated models over another, the database reports welfare estimates associated with all resource changes for that study. Second, as described below, the coding protocol we apply ensures that none of the welfare estimates in the database are simple linear transformations of one another.

One important characteristic to note about the database is that it may report many estimates of value for the same change in resource conditions using the same underlying data (i.e., sample of respondents). For example, as mentioned in the second bullet point above, a study may report an estimate of value for increasing the catch rate at a particular site. Another study may use the same data to estimate the value for the same change in resource conditions (e.g., increasing the catch rate) at the same site, however, the models used to estimate the two values may differ between the two studies. To help identify these cases, the database indicates studies that use the same underlying data. To avoid obtaining several value estimates associated with the same fishing commodity for a given respondent sample, database users may wish to select one welfare estimate from the group.

We developed criterion to “select” (or identify) one welfare estimate from several that may be associated with a given change in resource conditions and set of respondents. This criterion identifies one welfare estimate when several methodologies may have been used to estimate the same type of value using the same data. This could occur, for example, when one author estimates the value of a fishing commodity using both travel cost and contingent valuation approaches. This criterion also identifies one welfare estimate when multiple authors use the same data set to measure the same resource change. The welfare estimate criterion is based on author-preference for results, or study team preference.² Note that the criterion was inclusive enough so that no “selection” decision was based purely on study methodology (travel cost vs. contingent valuation).

For example, users of the database may wish to identify salmon valuation studies that use the travel cost methodology. If the user includes the welfare estimate “selection” variable in the database query to identify studies, this would ensure that only one observation would be identified for each sample and change in resource conditions. For example, a study might investigate a large number of functional form specifications using a single set of data. Imposing the selection variable in the query to identify studies would avoid the mean of the resultant list of welfare estimates appearing to have an artificially deflated standard error or being skewed by a high number of observations from this single study. It is possible for database users to develop their own selection criterion. In addition, it is also possible that database users could ignore this selection field and investigate the effect of various estimation procedures on welfare estimation.

² The “study team” comprises the authors of this document.

In the remainder of this chapter we first describe in detail the coding protocol we applied to develop the database. Second, we describe the structure and contents of the resulting database, including a definition of each field. Third, we present our criteria for selecting welfare estimates for a specific change in resource conditions in cases where there were many welfare estimates derived from the same underlying data. Finally, this chapter closes with a brief statistical summary of the recorded estimates.

Coding Protocol

For a given study, the database provides highly detailed information on each welfare estimate corresponding to a change in fishing conditions for selected model specifications. The welfare estimates we record in the database adhere to the following coding protocol designed to reflect each author's conclusions regarding the most appropriate model for welfare estimation and the most parsimonious representation of welfare estimates reported in each study.

Unless the author specifically rejects a model in a given study, we record results from all models reported. For example, an author may compare results from several models to demonstrate the robustness, efficiency, or unbiased nature of a particular model. If the author concludes that the results of a certain model are only for "comparative" purposes or are "unreliable," we do not code the results of that model in the database. If an author compares the results of many models without making a judgment about its reliability or applicability, the database records results from all models.

If two studies exactly duplicate each other, the database excludes (and notes that it excludes) welfare estimate information from one of the studies. For example, an author's working paper results may duplicate, in part or total, those from a corresponding journal article. In this case, the database excludes the duplicate welfare estimates from one of the studies.

The database does not provide detailed records for each variant of a welfare estimate provided by the study (e.g., consumer surplus values per day, per year, and per season) if it can be calculated from information provided in the study. For example, a study may estimate a per-day value for resident angling at a site and transform this result into a per-trip estimate using the average number of days per trip for fishing at that site. In this case, the database records only the per-day estimate, but provides the mean days-per-trip statistic for transformation purposes. If, however, a study estimates per-day and per-trip values using two different estimates, the database records both values.

Finally, the database records only individual consumer surplus value estimates. If a study estimates aggregate benefits of a policy action, we only include it in the database when the author provides the data necessary to convert it to an individual estimate.

Database Description

The database contains 124 citations for recreational fishing valuation studies, representing fishing opportunities across the U.S. Of these 124 studies, 15 contain duplicate results. As a result, we only include detailed study and sample information for welfare estimates from the 109 unique studies. The database contains over 100 fields of information for each welfare estimate. These fields are divided into three major categories of information: general study characteristics, welfare estimate characteristics and methodological information. We further organize the database into 17 groups of data that constitute these categories (e.g., species, geographic location, habitat/water type, socioeconomic data, survey information, model specification).

As discussed in the previous section, because a study may provide several welfare estimates (e.g., due to differing valuation methodologies, estimation approaches, or changes in fishing conditions), the database provides a detailed record of information for each reported estimate. We designed the database to provide as much explanatory information as possible on each of the studies and recorded estimates. For each study, the general comment field describes the welfare estimates reported in the study, those coded in the database, and those that our criteria identifies as the “selected” welfare estimate per sample of respondents for each change in fishing conditions. In addition, every field of the database has an associated “memo” field. These memo fields tell the user on which page of the study the information reported in the database was found, as well as other relevant information describing the database contents. If the value of the field was inferred from the data in the study, the memo field will state “NSS,” or “Not Specifically Stated.” Or, if we calculated the mean value of a variable (e.g., income) using a weighted average procedure, the memo field accompanying the record will describe the procedure used.

In this section, we define each field of the database and the possible codes for each of these fields. Appendix B provides a copy of the coding sheet we used to code each study.

General Study Characteristics

The information we collected to describe the “General Study Characteristics” includes bibliographic information; information describing the geographical, biological, and ecological characteristics of the site; and sample characteristics, such as fishing mode, socioeconomics, and sample size. Below, we describe all of the fields that constitute this category.

Citation

This field reports citation information and general commentary on each of the studies. This information applies to all welfare estimates reported for a study.

- **Study Code:** A numerical code, which ranges in value from 1 to 161, uniquely identifying each study. Because some of the studies selected as part of the initial literature search were deemed not relevant, not all of the 161 study codes appear in the database. Studies excluded from the database that may have been enumerated include those producing value estimates for resources other than fishing (e.g., swimming, wildlife viewing) or for a combination of activities (e.g., total values, water-related activities).
- **Comment:** A summary describing the welfare estimates and models reported in the study, those coded in the database, and those that we select for a given set of data and change in resource conditions.
- **Author-Enhanced Coding Sheet:** A binary variable indicating whether the author of the study provided coding information not explicitly given in the study publication (1=yes, 0=no).
- **Source of Data:** Identical sources of data were used to estimate resource values across several of the studies included in the database. To track this information and avoid reporting duplicate estimates, this field reports the primary source(s) of economic data used for each of the studies.
- **Data Originally Used in this Study:** A binary variable indicating whether this study was the first to use the data listed in “Source of Data” (1=yes, 0=no).
- **Other Studies Using Data:** This field lists the other studies using the data by study code number or, if not part of the database, by author.
- **Bibliographic Information:** Seven fields in the database provide the bibliography information for each study:
 1. Author(s)
 2. Title
 3. Source (e.g., journal name)
 4. Volume
 5. Date (month-day-year)
 6. Page (beginning-end)
 7. Publisher (if appropriate)
- **Literature Type:** This field lists the broad literature-type classification for each study (e.g., journal article, technical report, working paper, government document).

Welfare Estimate Number

A code enumerating the welfare estimates from each study. Because some studies provide more than one welfare estimate, this field ranges in value from one to the maximum number of welfare estimates recorded for a given study. For example, the database records information on nine welfare estimate results for database study #1 by Agnello and Han. Thus, this field ranges in value from 1 to 9 for that study.

The remaining fields of the database describe each welfare estimate provided by a given study.

Geographic Location

The database describes the geographic location of the resource being valued using a number of binary variables and site description fields:

- **National:** A binary variable indicating national welfare estimates (1=yes, 0=no).
- **Multi-State Region:** A binary variable indicating welfare estimates of resources crossing state boundaries (e.g., the Chesapeake Bay Watershed) (1=yes, 0=no).
- **Sub-State Region:** A binary variable indicating welfare estimates of resources entirely contained within one state (e.g., a river basin wholly contained within a state) (1=yes, 0=no).
- **Sub-State Description:** If the welfare estimate represents a sub-state region, this field contains a description of the site.
- **State List:** A list of all states relevant to the welfare estimate.
- **County:** A binary variable indicating welfare estimates representing county values (1=yes, 0=no).
- **County Name:** If “County”=1, this field lists the county or counties relevant to the welfare estimate.
- **Site Name:** The site name of the valued resource. If the welfare estimate represents a sub-state region, the value of this field may be the same as that reported in “Sub-State Description.”
- **Site Description:** A numerical variable that describes whether a welfare estimate represents a value for an individual fishing resource, several fishing resources simultaneously, or fishing resources nationwide. If the

welfare estimate reflects an individual resource (e.g., a river or a specific site on a river) the value of this field equals 1. If the welfare estimate represents a value for more than one fishery resource at a time (e.g., Boston Harbor and New Bedford Harbor) the value of this field equals 0. If a study provides a nationwide welfare estimate for sport fishing, the value of this field equals -1.

A welfare estimate describing the value for an entire state would be indicated by a value of 0 for the “National,” “Multi-State Region,” “Sub-State Region,” and “County” fields.

Habitat/Water Type

The following variables describe the water type associated with the valued resource:

- **Standing Water (Lake, Pond, Reservoir):** (1=yes, 0=no)
- **Estuary or Bay:** (1=yes, 0=no)
- **Marine (Open Ocean):** (1=yes, 0=no)
- **River:** (1=yes, 0=no)
- **Great Lakes:** (1=yes, 0=no)
- **Other:** This field lists the water type associated with the welfare estimate when none of the above water type categories are appropriate (e.g., wetlands).

As many fields can have the value of one as are appropriate for a given welfare estimate. For example, study #3 provides a value for grouper, seatrout and snapper fished in bay, ocean, and river habitats.

Species

This field reports the fish species represented by the welfare estimate as reported by the study – in some cases, species are listed by group (e.g., coldwater, warmwater), in other cases, species are listed by name (e.g., salmon, trout). If a study provided sufficient information to decompose a group type (e.g., coldwater) into individual species, the database records the individual species; otherwise, the database records the species group. If the estimate represents a value for more than one species, all relevant species are listed. If the welfare estimate is associated with the loss (or gain) of one particular species, but several species are noted as being present in the waterbody, only the valued species is listed. Other species, either present in the waterbody or included as part of the model specification, are listed under the “Other Quality Attributes Listed in Study” field in the “Site Quality Characteristics” section.

Fishing Mode and Restrictions

Several fields describe the mode of fishing for the valued resource. The database tracks the following modes, including a field for “Other” to describe any other modes not included in this list:

- **Shore (pier or breakwater):** (1=yes, 0=no)
- **Boat (privately owned):** (1=yes, 0=no)
- **Boat (charter, party guided):** (1=yes, 0=no)
- **Boat (unspecified type):** (1=yes, 0=no)
- **Fly Fishing:** (1=yes, 0=no)
- **Ice Fishing:** (1=yes, 0=no)

Where possible, the study reports the specific type of boat fishing undertaken by an angler (private or charter). However, when a study reports that anglers fished by boat but did not specify the type of boating activity, the database codes this information with a value of one under “Boat (unspecified type)”, and a blank in the private and charter boat categories.

Any fishing restrictions reported in the study are tracked under the “Fishing Regulations” field of this section. For example, the valued resource may have fishing only, catch limits, or catch and release restrictions.

Socioeconomic Characteristics

Seven fields provide socioeconomic characteristics of the sample used to derive each welfare estimate:

- **Income:** The mean value of income for the sample respondents.
- **Education:** The mean number of years of education for the sample.
- **Age:** The mean age of respondents in the sample.
- **Gender:** The mean value of the gender of the sample (between 0 and 1) – 0 represents all male respondents and 1 represents all female respondents.
- **Residents/Non-Residents/Both:** Reports whether the sample is made up only of residents (coded as 1); non-residents (coded as -1); or both residents and non-residents (coded as 0) of the state in which the resource is located.

- **Race:** The mean value of the race of the sample (between 0 and 1) – 0 represents all Caucasian respondents and 1 represents all non-Caucasian respondents.
- **Avidity/Experience Characteristics Listed in the Study:** A listing of avidity characteristics reported in the study (e.g., average number of years of fishing experience).

Sometimes a study provides income, education, or age information of the sample by level, and not by actual dollars or number of years. In these cases the database reports a weighted average (e.g., study #159 by Tay and McCarthy provides income averages for four income classes; we calculate a weighted average across classes using the mean of each category). The comment field documents how such calculations are carried out.

Site Quality

The “Site Quality” fields describe the quality of fishing at the site in terms of catch rate, high quality characteristics, and other quality attributes such as other species sought or present in the water body.

- **Mean Catch Rate and Units:** Mean value of the catch rate for the species valued. In addition, this field is modified by a set of binary variables that define the units of the mean catch rate value including: per trip, per hour, per day, per year, and per season (1=yes, 0=no). In addition, if this catch rate reflects a per person rate, the “per person” field is coded with a 1, otherwise it is coded as 0.
- **Site Identified as High Quality by Author:** A binary variable indicating that the author explicitly stated that the valued resource is of high quality (1=yes, 0=no).
- **High Quality Characteristics:** If the author states the site is of high quality, this text field describes the high quality characteristics of the resource.
- **Other Quality Attributes Listed in Study:** This field describes other quality attributes of the resource, including nearby alternative resources or species. For example, if the study values bass fishing at a given site, but states that this site also provides a trout fishery, this field reports the other species present at the site.

Data Collection

The database provides general information on the data collection methods and the sample used to estimate the fishing value. Because different models use somewhat different conventions about “sample size,” we collect various types of statistics for each model type:

- **Data Collection Begin and End Date:** The starting and ending dates of data collection. If only one date is given, the starting and ending date will be identical. These data are reported with the level of detail provided by the author (e.g., month-day-year, month-year, year).
- **Number of Respondents:** The number of respondents used to obtain the welfare estimate. For many models (other than zonal travel cost and random utility models) this is also the number of observations in the estimated empirical model. For zonal travel cost and random utility models, the number of respondents and observations may not be the same because of averaging over respondents to create origin-destination combinations (in zonal travel cost models) or because of multiple choice occasions per respondent (in random utility models).
- **Number of Origin Zones:** If the model is a zonal travel cost model, this field records the number of origin zones used in the estimation.
- **Multiple Destination Zones:** If the model is a zonal travel cost model, this field takes on a value of 1 when the study analyzed multiple destination zones, 0 otherwise.
- **Number of Choice Occasions:** If the model is a random utility model, this field indicates the number of choice occasions for the sample (i.e., the product of the number of respondents and the average number of choice occasions per person). For example, an analysis may estimate values by modeling weekly choices of each respondent for a three-month period. In this case, the number of choice occasions would be the product of four weeks and three months for n respondents, or $12n$ choice occasions.

Study Type

This field reports the methodology used to estimate the fishing value:

- **Valuation Methodology:** This field takes on a value of 1 for a contingent valuation estimate, and a value of 0 for a travel cost estimate.

Welfare Estimate

The information we collected characterizes each reported consumer surplus value estimate using several fields. These fields provide statistics on the welfare estimate (e.g., standard error), estimate units (e.g., average total consumer surplus per fish caught per trip), mean unit values necessary to convert the estimate to other units (e.g., days per trip), and the definition of the commodity underlying the estimate (e.g., baseline conditions, change in resource). We describe these fields below.

Estimate

The “Estimate” fields report information characterizing the value estimate:

- **Consumer Surplus Estimate:** The absolute value of the estimate in dollars.
- **Year of Welfare Estimate Dollars:** The dollar year of the estimate.
- **Individual Estimate:** This field equals 1 if the consumer surplus estimate represents an individual value. The field equals 0 if the estimate represents an aggregate (i.e., population) value.
- **Standard Error of Mean Reported:** A binary variable indicating that the author provided a measure of the standard error of the mean welfare estimate (1=yes, 0=no).
- **Variability of Welfare Estimate:** This field contains the standard error of the mean welfare estimate if the “Standard Error of Mean Reported” field equals 1. In cases where the author only reports the standard deviation (of either the mean or the overall sample) this field contains this value, the memo to this field describes the nature of the statistic, and the “Standard Error of Mean Reported” field equals 0. The database reports statistics provided in each of the studies, users interested in interpreting the statistic should refer to the actual study.
- **Estimate Selection:** To provide the user with a simple way to identify one welfare estimate associated with a particular change in fishing conditions and sample of respondents, the database contains the “Welfare Estimate Selection” field. For example, a study may provide several welfare estimates for a given resource condition (e.g., increase in catch rate) because a variety of models were applied to a single set of data. In addition, several studies may utilize the same data to estimate the value associated with a given commodity but apply different estimation

procedures. In these cases, this field will identify one of the resource change/sample observations as the “selected” benefit estimate using the following selection criterion. The four possible values for this field are:

- 1: The author presents criteria indicating the superiority of a given estimate over another. In this case, the field takes on a value of 1 for the author-stated superior estimate, and is blank for the other estimate.
- 0: When an estimate is the only one of its kind (i.e., for a given sample of respondents, it is the only value estimate for a given change in resource conditions), this field equals 0.
- 1: When the author does not indicate a preference for a given welfare estimate, or when multiple authors use the same data set for valuing the same resource change, we applied a standard protocol to select an estimate for a given sample of respondents and change in resource conditions. When a welfare estimate satisfies this standard protocol the field equals -1. This protocol is described in detail in the next section.

This field is left blank for those estimates not preferred by the author and not satisfying the study group protocol.

In all cases, author-stated criteria takes precedence over study-group protocol. If an author did not state a preference for an estimate, the study- group preferred estimates are based on welfare estimate selection criteria described in detail in the next section. The general comment section to each study summarizes our selection decision.

Estimate Units

The database reports the units of each welfare estimate using several binary and numerical variables. First, the database categorizes estimates as per fish caught, per fish kept, per day, per trip, per year, or per season. In the case of “per fish caught” or “per fish kept,” the database also reports if the value estimate is per day, per trip, per year, or per season. Second, the database categorizes estimates as either an “average total” or “average marginal” value estimate. Average total welfare estimates represent the value associated with the complete loss of the fishing resource or fishing opportunity. Average marginal welfare estimates represent the value associated with an incremental change in fishing conditions such as a change in quality. Marginal estimates may be associated with either an improvement or deterioration of fishing conditions. If the units of the welfare estimate cannot be described with the designated categories, this information is coded in the “Other” field (e.g., median or per-household values).

- **Average Total Consumer Surplus**

⇒ per fish caught (1=yes, 0=no). If this field equals 1, the “per day, trip, year, season” variable modifies this field:

- 1 if per day
- 2 if per trip
- 3 if per year
- 4 if per season

⇒ per fish kept (1=yes, 0=no). If this field equals 1, the “per day, trip, year, season” variable modifies this field:

- 1 if per day
- 2 if per trip
- 3 if per year
- 4 if per season

⇒ per day (1=yes, 0=no)

⇒ per trip (1=yes, 0=no)

⇒ per year (1=yes, 0=no)

⇒ per season (1=yes, 0=no)

- **Average Marginal Consumer Surplus**

⇒ per fish caught (1=yes, 0=no). If this field equals 1, the “per day, trip, year, season” variable modifies this field:

- 1 if per day
- 2 if per trip
- 3 if per year
- 4 if per season

⇒ per fish kept (1=yes, 0=no). If this field equals 1, the “per day, trip, year, season” variable modifies this field:

- 1 if per day
- 2 if per trip
- 3 if per year
- 4 if per season

⇒ per day (1=yes, 0=no)

⇒ per trip (1=yes, 0=no)

⇒ per season (1=yes, 0=no)

⇒ per year (1=yes, 0=no)

- **Other**

Fishing Effort

When provided in the study, the database provides mean values for several measures of resource use. These statistics may be used to convert the welfare estimates to other units.

- **Fishing days per year**
- **Fishing days per trip**
- **Fishing trips per year**
- **Fishing trips per season**
- **Season length:** This field contains the length of a fishing season (e.g., in months).
- **Days per season:** This field contains the average number of days in a season.
- **Other**

Baseline/Alternative

Several fields of information describe the valued resource commodity. These fields distinguish between a total loss of the resource or total loss of access versus an incremental change in the quality of the fishing resource. The last five fields in the list below contain information only when the estimate reflects an incremental change in the resource.

- **All or Nothing Consumer Surplus:** A binary variable (1=yes, 0=no) reporting if the welfare estimate reflects a total loss of the resource or resource access (e.g., the willingness to pay to maintain access to a fishery). When this is true, the only other field in this section containing information on the estimate is “Status Quo Definition.” When the welfare estimate reflects a value for an incremental change in the resource, the “All or Nothing” field equals zero.
- **Status Quo Definition:** When the estimate reflects the value for the total loss of the resource, this field provides the definition of baseline or “status quo” conditions for the resource.
- **Baseline Defined for Measurement:** When the estimate reflects the value for an incremental change in resource conditions, this binary variable (1=yes, 0=no) indicates that the study defines the baseline conditions of the resource to the respondent (e.g., the study asks the respondent his willingness to pay for a change from current conditions).

- **Baseline Reported in Study:** When the estimate reflects the value for an incremental change in resource conditions, this binary variable (1=yes, 0=no) indicates that the study reports the baseline conditions to the reader (e.g., the current mean catch rate is reported in the study).
- **Baseline Definition:** When “Baseline Reported in Study”=1, this field provides the baseline definition as reported in the study (e.g., current mean catch rate).
- **Change in Resource:** When the estimate reflects the value for an incremental change in resource conditions, this field provides a description of the change in the resource underlying the welfare estimate (e.g., doubling the current catch rate).
- **Point Estimate of Change (e.g., -50%, +50%):** When the estimate reflects the value for an incremental change in resource conditions, this field quantifies, to the extent possible, the incremental change in the resource. For example, if the change in the resource is a doubling of the current catch rate, the value of this field would be +100%.

Methodology

The “Methodology” section describes the survey methodology used to generate the welfare estimate, and specific characteristics of the estimator and model specification. Below, we describe the fields that constitute this category.

Survey Characteristics

The database indicates the methods used to collect data for estimation. Three binary variables represent the different survey types:

- **Mail Survey:** (1=yes, 0=no)
- **Phone Survey:** (1=yes, 0=no)
- **In-Person Interview:** (1=yes, 0=no)

In cases where a study uses several types of surveys to gather data, the database will report the mode for each survey. In this case, more than one of the above techniques may be selected for a given estimate. For example, a study may gather fishing behavior data in-person and follow that with a mail survey to collect more information. In this situation both “In Person Interview” and “Mail Survey” will equal 1. However, in the special case where the study uses a phone survey simply to identify a sample for a mail survey, the database records this survey only as a “Mail Survey” (i.e., “Mail Survey”=1, “Phone Survey”=0).

The database reports the response rate of the survey as a percentage. Three fields follow “Survey Response Rate” to describe how this percentage value was calculated:

- **Survey Response Rate:** (percentage)³
 - ⇒ Percent of Deliverables (1=yes, 0=no): Number of surveys returned as a percentage of the number of surveys that actually reached the intended recipient (e.g., does not include individuals who moved).
 - ⇒ Percent of Total (1=yes, 0=no): Number of surveys returned as a percentage of the total number of surveys administered.
 - ⇒ Other (e.g., Usables): If the above two categories are not adequate descriptors, this text field provides a description of the how the authors calculate response rate.

Methodology

The database describes the type of estimator and the functional form of the model used to derive value estimates. Because not all of the estimator choices are appropriate for both travel cost and contingent valuation (e.g., multinomial logit is an unlikely estimator for contingent valuation data), the values of these fields will differ by study type. These differences are described below:

- **Estimator:** A number between 0 and 8 to indicate the type of estimator used. If none of these categories apply, the database lists the type of estimator in this field (e.g., weighted least squares).
 - 0: No Equation
 - 1: Ordinary Least Squares (OLS)
 - 2: Two-Stage Least Squares (2SLS)
 - 3: Tobit
 - 4: Probit
 - 5: Logit
 - 6: Non-Parametric
 - 7: Multinomial Logit (MNL)
 - 8: Full Information Maximum Likelihood (FIML)

Contingent valuation studies: Possible coding options include 0 (No Equation) through 6 (Non-Parametric).

³ In survey research, the two acceptable response rate statistics are percent of contacts and percent of total. The database user should consult the individual studies in cases where response rate is calculated using another method (e.g., usables).

Travel cost studies: Possible coding options include 1, 2, 3, 7 and 8.

- **Left-hand-side Functional Form:** A number ranging from 0 to 2 indicating functional form of the dependent variable.

0: Not Applicable

1: Linear

2: Log

These are valid functional form types for either the contingent valuation or travel cost methodologies. The functional form will not apply to a dichotomous choice equation for a contingent valuation study, nor will it apply to a travel cost random utility model. In these cases, this field will contain the value of zero.

Contingent Valuation

Several fields in the database describe characteristics of the contingent valuation survey and estimation methodology for each coded contingent valuation estimate. Three general categories constitute these fields: Survey Information, Welfare Estimation, and Independent Variables.

Survey Information

- **Substitute Variables:** This text field lists the substitute variables described in the study or provided in the survey.
- **Payment Vehicle:** A description of how the survey elicited a response from the respondent (e.g., one-time payment, tax, voluntary contribution).
- **WTP value:** A binary variable indicating if the respondent provided a willingness-to-pay (WTP) bid, versus a willingness-to-accept (WTA) bid (1=WTP, 0=WTA).
- **Trimmed Data:** A binary variable indicating that the data were trimmed before final estimation (e.g., outliers were removed from data set) (1=yes, 0=no).
- **Question Type:** A number indicating the type of survey question administered to the respondents, as described below. In cases where more than one survey technique was used in a study, the question type is coded as a “combination.” In this case, the type of question used to obtain the last response determines the value of this field.

- 1: Dichotomous Choice
- 21: Combination/Dichotomous Choice
- 23: Combination/Open Ended
- 24: Combination/Iterative Bidding
- 25: Combination/Payment Card
- 3: Open Ended
- 4: Iterative Bidding
- 5: Payment Card

- **Single Bounded:** A binary variable indicating that the contingent valuation survey asked a single bid question versus multiple bid questions that ask for responses to a higher (or lower) willingness to pay bid depending on the response to the initial question (1=single bid, 0=multiple bid). This field is only valid with dichotomous choice surveys (survey type = 1 or 21).
- **Anchoring:** A binary variable (1=yes, 0=no) indicating that the survey interspersed payment card bids with expenditure items familiar to respondents (e.g., education or crime expenditures). This field is only valid with payment card surveys (“Question Type”=5 or 25).

Welfare Estimation

- **WTP Amount Coding:** A numerical field indicating how the authors code the willingness to pay values from the payment card survey:
 - 1: midpoints of the payment card bids were coded,
 - 2: endpoints of the payment card bids were coded, and
 - 3: some alternative method was used to code the payment card bids.

This field is only valid with payment card surveys (“Question Type”=5 or 25).

- **Non-Dichotomous Choice Contingent Valuation Estimator:** A numerical field indicating the method for deriving welfare estimates from a study using a non-dichotomous choice estimator (e.g., payment card):
 - 1: Mean
 - 2: Median
 - 3: Predicted

- **Predicted Method:** A numerical field indicating how the authors obtained the predicted values used to generate welfare estimates. This field is relevant only when the value of the above field equals 3. The estimates could be derived from using individual observations, the mean of the observations, or the median of the observations:

- 1: Individual
- 2: Mean
- 3: Median

If the author applied individual sample observations to obtain a prediction from the model, the value of this field equals 1. If the author applied the mean value of the observations to obtain a prediction from the model, the value of this field equals 2. Finally, if the author applied the median value of the observations to obtain a prediction from the model, the value of this field equals 3.

- **Dichotomous Choice Approach:** If the welfare estimate relied on a dichotomous choice model, this field describes the approach the study takes to estimate welfare. If the study calculates a “truncated mean” (i.e., the difference in utility functions where upper truncation occurs at some point other than +4), or relies on the “Hanemann” approach (i.e., the difference in indirect utility functions with an upper truncation point of +4) to estimate welfare, this field takes on a value of one. If the study develops welfare estimates using a difference in cost functions (i.e., “Cameron” approach), this field takes on a value of zero.
- **Truncation:** For dichotomous choice models using the truncated mean or Hanemann approach (i.e., “Dichotomous Choice Approach”=1), this field provides information on the truncation technique for calculating the welfare estimate. The dichotomous choice model estimates the probability of observing a welfare estimate over a continuous range of values (-4 to +4). To bound the range, the author must indicate an upper and lower truncation point. For the lower truncation point, the author may either ignore all negative values when calculating the welfare estimate or selects a truncation point less than zero (i.e., net the negative values out of the calculation). If the author ignores the negative values in the calculation (i.e., truncates at 0 -- as in the Hanemann approach), this field equals 1. If the study truncates at some negative value, this field equals 0.

- **Upper Truncation Percentile:** For dichotomous choice models using the truncated mean (i.e., “Dichotomous Choice Approach”=1), this field contains the truncation percentile calculated from the upper truncation point. The database records this value as the probability of a “no” response. If the study uses the Hanemann approach then the memo to this field will say “positive infinity,” and the “Upper Truncation Percentile” field will be blank.
- **Lower Truncation Percentile:** For dichotomous choice models using the truncated mean (i.e., “Dichotomous Choice Approach”=1), this field contains the truncation percentile calculated from the lower truncation point. The database records this value as the probability of a “no” response. This field is relevant only when “Truncation”=0 (i.e., this field is not relevant when the study uses the Hanemann approach that truncates at 0).

Independent Variables

The database provides several types of information to describe the model specification. For each of the variables listed below, the database reports whether or not it is included in the specification. If included, the database reports the functional form and the significance of the variable. A variable is considered significant at the 10 percent level.

- **Independent Variables:** The database reports on 13 independent variables that may be included in the estimation of contingent values, including:
 1. Income
 2. Education
 3. Age
 4. Gender
 5. Race
 6. Quality Variable 1: The database enables coding of two quality variables, each of which is described in more detail in the comment field (e.g., catch rate and pond clarity).
 7. Quality Variable 2
 8. Substitute Prices
 9. Other Substitute Variables
 10. Dichotomous Choice Bid: A study relying on a dichotomous choice approach can include the actual bid amount provided in the survey in the model specification. This field is valid only when “Question ype”=1 or 21.

11. Starting Bid: This field is valid only for Iterative Bidding surveys (i.e., “Question Type”=4 or 24).
12. Avidity/Experience
13. Other

For each of the above independent variables, the field takes on one of 11 values, depending on functional form and significance. If a variable is not included, or when a study indicates a variable has been excluded from the final specification because it had been insignificant in prior estimations, the field equals 0.

If the variable is included in the model, the first digit of the two-digit value represents the functional form of the variable as noted below. The term “Interaction” refers to the case where the variable is multiplied or divided by another variable. The second digit in the two-digit value represents the significance (i.e., a 1 represents variable significance, a 0 represents insignificance). If significance is not explicit, the field takes on the value representing only the functional format (1, 2, 3, 4, or 5).

- ⇒ Not Included = 0
- ⇒ Linear, Insignificant = 10
- ⇒ Linear, Significant = 11
- ⇒ Log, Insignificant = 20
- ⇒ Log, Significant = 21
- ⇒ Interaction, Insignificant = 30
- ⇒ Interaction, Significant = 31
- ⇒ Square, Insignificant = 40
- ⇒ Square, Significant = 41
- ⇒ Other, Insignificant = 50
- ⇒ Other, Significant = 51

Travel Cost

Several fields in the database describe model characteristics for travel cost estimates:

- **Travel Cost Type:** A value representing one of three possible model types for estimating travel cost values:
 - 1: Zonal Model
 - 2: Individual Observation Model
 - 3: Random Utility Model (RUM)

- **Opportunity Cost of Travel Time Included:** A binary variable (1=yes, 0=no) indicating whether the opportunity cost of travel time is included in the model specification.
- **Opportunity Cost:** This field reports the opportunity cost of travel time used in the study. Database users should note that not all values in this field represent the same units of opportunity cost. For example, this field may state that the study uses an opportunity cost of time equal to some dollar amount per hour, some percent of the wage rate, or some calculation based on trip time and income.
- **Travel Time:** The average travel time as reported in the study. The memo to this field states if this field represents one-way or round-trip travel time.
- **Travel Time Units:** The units describing the travel time noted in the previous field.
- **Dependent Variable Type:** The form of the dependent variable, if the travel cost model is either a zonal or an individual observation model:

- 1: Trips
- 2: Days
- 3: Other

If the dependent variable type is “Other,” the memo field contains details of the dependent variable.

- **Zonal Type:** If a zonal travel cost model groups observations by zone this field equals 1, if the model maintains individual observations this field equals 2.
- **Nesting Structure:** A text field providing a description of the nesting structure used for the RUM models.
- **Independent Variables:** The database reports on 12 independent variables that may be included in the estimation of travel cost values, including:
 1. Income
 2. Education

3. Age
4. Gender
5. Race
6. Quality Variable 1: The database enables coding of two quality variables, each of which is described in more detail in the comment field (e.g, catch rate and pond clarity).
7. Quality Variable 2
8. Substitute Prices
9. Other Substitute Variable
10. Travel Cost: This field reports whether the actual travel cost amount is included in the model specification.
11. Avidity/Experience
12. Other

For each of the above independent variables, the field could take on one of 11 values, depending on functional form and significance. If a variable is not included, or when a study indicates a variable has been excluded from the final specification because it had been insignificant in prior estimations, the field equals 0.

If the variable is included in the model, the first digit of the two-digit value represents the functional form of the variable as noted below. The term “Interaction” refers to the case where the variable is crossed with another variable. The second digit in the two-digit value represents the significance (i.e., a 1 represents variable significance, a 0 represents insignificance). If significance is not explicit, the field equals a number representing only the functional format (1, 2, 3, 4, or 5).

- ⇒ Not Included = 0
- ⇒ Linear, Insignificant = 10
- ⇒ Linear, Significant = 11
- ⇒ Log, Insignificant = 20
- ⇒ Log, Significant = 21
- ⇒ Interaction, Insignificant = 30
- ⇒ Interaction, Significant = 31
- ⇒ Square, Insignificant = 40
- ⇒ Square, Significant = 41
- ⇒ Other, Insignificant = 50
- ⇒ Other, Significant = 51

Welfare Estimate Selection

One goal of the database is to provide the user with a set of welfare estimates which uniquely identify particular changes in fishing conditions for a given sample of respondents. To do this, we develop a procedure to “select” one welfare estimate from a group of many which may provide value estimates for the same resource change using the same data. We base this selection on author-preferred results and study group criteria. The “Citation/Comment” field, described in the “Database Description” section of this chapter, records our exact reasoning underlying the coding of each study. In this section, we describe the procedure we follow to identify selected welfare estimates from the database.

For each welfare estimate, the “selection” field will contain one of four possible values: not selected (blank), only estimate reported (0), author-stated criteria (1), or study group protocol (-1). The simplest case occurs when a study reports one welfare estimate measuring value for a given change in fishing conditions. For example, an author collects data from a sample of respondents to estimate the value of a fishing experience improvement (e.g., increasing catch rate by 50 percent). If no other study uses these data to measure the same change in conditions (e.g., another study could, perhaps, use a different modeling approach) and the author reports only one value estimate for this particular resource change, the database selects this estimate, coding it as the “only estimate reported” (0).

If, however, a study provides results from two or more models that estimate the same value for a change in fishing conditions using identical samples, we identify a representative, unique estimate. We first select the welfare estimate based on “author-stated criteria.” If the author does not provide such criteria, or if two different studies provide the same type of value estimate using the same data, we select the estimate based on “study group protocol.”

1. **Author-Stated Criteria:** A study may explicitly state a preference for one model specification, or it may describe the results of one model as being superior to another based on statistical criteria. Some examples of this criteria include:
 - The author might state a preference for the results of one model over another in terms of goodness-of-fit criteria.
 - After having tested the stability of key parameter estimates for several models, the author might state that one model is more robust than another.
 - Given the range of values in the data the author might state that the median estimates are more appropriate than the mean estimates.
2. **Study Group Protocol:** When an author fails to indicate a preferred model for a given welfare estimate, we applied a standard protocol to select an estimate for a given change in resource conditions and sample. The database selects welfare estimates that:

- a) Provide the most information about the use of a resource. The database selects values for a variety of subsamples over that of an aggregate sample. For example, if a study provides welfare estimates for residents, non-residents and a combined sample, we select the resident and non-resident estimates over the combined sample estimates. Another example would be a study that provides welfare estimates for two sites individually and both sites combined. We select the individual site models over the combined sites model, because it provides more information on each individual resource.
- b) Comply most closely with economic theory. When authors test the effects of a variety of specifications on welfare estimates without establishing a preference for one model over another, we rely on economic theory to select the unique estimate. For example, a study may provide welfare estimates for two sites by estimating models for Site A and Site B individually, and a model of simultaneous equations accounting for substitution between Sites A and B. Because substitution is an important economic concept, the database selects the model that takes site substitution into account.
- c) Use sample groupings that are most policy-relevant. A study may create several different types of sub-groupings of respondents from a given sample to provide many estimates of value for a given change in resource conditions (e.g., increase in catch rate). For example, a study may estimate a value for increased catch rate for: 1. anglers applying a given fishing mode and 2. anglers targeting a given species. The study group selects the estimate associated with the most policy-relevant sub-sample of anglers. In this case, we would select the species welfare estimate over the mode estimate.
- d) Represent common estimation procedures. When authors test the effects of a variety of estimation procedures on welfare estimates without establishing a preference for one procedure over another, we select the welfare value that was estimated with the most commonly used procedure in the literature and is most conceptually correct. For example, a contingent valuation study may provide welfare estimates for a commodity using open ended and payment card question formats. In this case, the study group protocol selects the estimate derived from the open ended format because this question format is more commonly used. Another example would be a study providing two travel cost estimates for a commodity, where one specification includes the opportunity cost of time and the other does not. In this case, the database selects the

welfare estimate from the model that includes the opportunity cost of time. In this case including the opportunity cost of time is more commonly used, and, conceptually, the welfare estimate should include a measure of this cost.

- e) Have been peer reviewed. A working paper and a journal article may both provide estimates of welfare for a given change in fishing conditions and sample of respondents. When other selection criteria do not hold, we select the welfare estimate that has undergone a peer review – in this case, the journal article. For example, one author may estimate the value for a change in fishing conditions using the same sample of respondents in a peer reviewed journal and a government document. The only difference between the two studies is that the author uses different data to characterize the resource (e.g., the water quality data used to represent resource quality differs between the two studies). In this situation, we select the peer-reviewed result to the government document result.
- f) Are Willingness to Pay Value Estimates. Because most of the studies estimate the willingness to pay for a given resource or resource change, we select willingness to pay value estimates over willingness to accept estimates unless willingness to accept estimates are specifically preferred by the author.
- g) Are Mean Value Estimates. Because most of the studies estimate the mean value of a given resource or resource change, we select mean over median value estimates unless median estimates are specifically preferred by the author.
- h) Represent the most conservative estimate. If none of the above criteria are useful for selecting one welfare estimate over another, the database selects the most conservative estimate. For example, if a contingent valuation study provides welfare estimates using uncommon question formats (e.g., payment card), we select the lowest estimate.

The “Comment” section in the database summarizes the criteria we use to select welfare estimates for each study.

In most cases, every study in the database measures the value of at least one change in resource conditions and will have at least one welfare estimate selected. Some studies will have many selected estimates because they provide measures of many types of environmental conditions and policy strategies. For example:

- If a study estimates the values of a 50 percent increase in catch for each of two species, the database selects both estimates.
- If a study estimates values for a 50 and 25 percent increase in catch for one species, the database selects both estimates.
- If a study estimates the value of a 50 percent increase in catch for one species using two different methodologies, the database indicates a selection for only one estimate because the commodities do not differ.

Other studies will have many selected estimates because they provide distinct estimates of value for a particular policy strategy (or environmental condition) and group of respondents. For example, under certain conditions, estimates of per trip, per day, per season, or per year values may all be selected for a given study. As long as these values are non-transformable (e.g., no simple transformation exists to transform per-day values into per-trip values), we select all estimates recorded in the database. This situation may occur when an author develops a different model for each type of value. This protocol, for example, would argue that annual values for an improvement in a fishing experience may not be related to per-day values for the same improvement.

Summary of Database Contents

The database reports detailed information for a large number of welfare estimates relative to the number of coded studies. Using the coding protocol discussed in the previous section, the 109 studies of the database have 3,104 recorded welfare estimates – on average there are 29 welfare estimates recorded per study. The welfare estimate selection criteria discussed in the previous section identified 1,676 unique estimates from 101 studies – on average there are 17 selected welfare estimates recorded per study. The majority of these 1,676 unique welfare estimates (961 estimates) were selected using the study group protocol. Many estimates were the only ones reported for a particular data set/resource change combination (648 estimates). In relatively few cases did the authors state a preference for some welfare estimates over others (67 estimates were selected using author-stated criteria).

Many of the studies in the database rely on data shared by other studies in the database. Of the 109 studies in the database, 52 use data that no other study in the database uses. Twenty seven datasets have more than one coded study associated with them. The average number of studies per shared dataset is three.

As mentioned in the coding protocol discussion, the database mainly records only individual estimates of value. If the author provides the data necessary for converting aggregate estimates of value, the database records the aggregate estimates and the information necessary to transform them to individual estimates. Two of the studies coded in the database report aggregate welfare estimates that may be converted to individual estimates given the information reported in the study.

The selected welfare estimates represent a range of estimation methodologies, commodity types, and literature types. Approximately 60 percent of the 1,676 selected welfare estimates derive from the travel cost methodology (992); approximately 40 percent derive from the contingent valuation methodology (684). The total and marginal welfare estimates are distributed relatively equally: 813 estimates represent total consumer surplus values and 863 estimates represent marginal values. Over one third of the selected estimates measure consumer surplus values per trip (635 estimates); one-third of the selected estimates measure either consumer surplus per day (281 estimates) or per fish caught (237 estimates). Exhibit 2-5 shows the frequency of welfare estimates by unit. Similar to the studies in the database (see Exhibit 2-1) the majority of these welfare estimates are from journal articles; several are from government reports, working papers, and technical reports.

Exhibit 2-5		
FREQUENCY OF SELECTED WELFARE ESTIMATES BY COMMODITY TYPE AND SURPLUS UNIT		
Consumer Surplus Unit	Total Value	Marginal Value
Per Day	266	15
Per Trip	422	213
Per Season	9	41
Per Year	37	121
Per Fish Caught	0	237
Per Fish Kept	9	3
Per Choice Occasion	16	30
Other ¹	54	203
ESTIMATE TOTALS:	813	863
¹ Example "Other" units include Per Inch, Per Two-Month Period, and Per Acre-Foot of Water.		

DATABASE STRUCTURE

The database was created as a relational database using Microsoft Access, version 2.0. The database consists of 32 independent data tables linked by study code and welfare estimate number. Appendix A provides details on the database structure and properties, listing field names, data types (e.g., text, number), and indices for each of the data tables.

Appendix A

DATABASE STRUCTURE

The database of sport fishing values was created using Microsoft Access, version 2.0. The database consists of 32 independent data tables that correspond to data groupings noted in the database coding sheet (Appendix B). These tables are linked by study code and welfare estimate number.

This appendix provides the details of the database structure and properties, including field names and definitions, data types (e.g., text, number), and indices (i.e. primary keys) for each of the data tables.

CITATION

SMF - Study Master file

This table contains citation information and reports one record for each study. STUDY_ID uniquely identifies each study throughout the database, in every table.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
COMMENT	Memo	-
AUTHOR_ENH_CSHEET	Yes/No	1
AUTHOR_ENH_CSHEET_MEMO	Memo	-
DATA_SOURCE	Text	170
DATA_SOURCE_MEMO	Memo	-
ORIGINAL_DATA	Yes/No	1
ORIGINAL_DATA_MEMO	Memo	-
OTHER_STUDY	Text	100
OTHER_STUDY_MEMO	Memo	-
AUTHOR	Text	110
AUTHOR_MEMO	Memo	-
SI_TITLE	Text	250
TITLE_MEMO	Memo	-
SOURCE	Text	100
SOURCE_MEMO	Memo	-
VOLUME	Number (Single) -	
VOLUME_MEMO	Memo	-
DATE	Text	8
DATE_MEMO	Memo	-
PAGE	Text	10
PAGE_MEMO	Memo	-
PUBLISHER	Text	100
PUBLISHER_MEMO	Memo	-
LITERATURE_TYPE_MEMO	Memo	-

Indices PrimaryKey
STUDY_ID

LLF - Literature List File

This table contains the literature types used in each study and reports one record for each study. This table links to the *SMF* file through the STUDY_ID field.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
LITR_TYPE	Text	25

Indices PrimaryKey
STUDY_ID
LITR_TYPE

GEOGRAPHIC LOCATION

BELF - Benefit Estimate, Location File

This table contains all location-related information for each benefit estimate. This table links to the *SSLBELF*, *SLBELF*, *CLBELF*, and *SNLBELF* files through the STUDY_ID and BEN_EST_ID fields, allowing multiple sub-state regions, states, counties, and site names, respectively, to be associated with each estimate.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
NATIONAL	Yes/No	1
NATIONAL_MEMO	Memo	-
MULTI_ST_REG	Yes/No	1
MULTI_ST_REG_MEMO	Memo	-
SUB_ST_REG	Yes/No	1
SUB_ST_REG_MEMO	Memo	-
SUB_ST_DESR_MEMO	Memo	-
STATE_MEMO	Memo	-
COUNTY	Yes/No	1
COUNTY_MEMO	Memo	-
COUNTY_NAME_MEMO	Memo	-
SITE_NAME_MEMO	Memo	-
SITE_DESCR	Text	2
SITE_DESCR_MEMO	Memo	-

Indices PrimaryKey
STUDY_ID
BEN_EST_ID

SSLBELF - Sub-State List for BELF File

This table lists the sub-state region(s) associated with a given benefit estimate. This table links to the **BELF** file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
SUB_ST_DESCR	Text	50

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
SUB_ST_DESCR

Key
STUDY_ID
BEN_EST_ID

SLBELF - State List for BELF File

This table lists the state(s) associated with a given benefit estimate. This table links to the **BELF** file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
STATE	Text	2

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
STATE

Key
STUDY_ID
BEN_EST_ID

CLBELF - County List for BELF File

This table lists the county(ies) associated with a given benefit estimate. This table links to the **BELF** file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
COUNTY_NAME	Text	25

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
COUNTY_NAME

Key
STUDY_ID
BEN_EST_ID

SNLBELF - Site Name List for BELF File

This table lists the specific site name(s) associated with a given benefit estimate. This table links to the **BELF** file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
SITE_NAME	Text	250

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
SITE_NAME

Key
STUDY_ID
BEN_EST_ID

HABITAT/WATER TYPE

BEHF - Benefit Estimate, Habitat File

This table contains the habitat information associated with a given benefit estimate. For those estimates with multiple species and otherwise unspecified habitats, this table links to the “Benefit Estimate Species File” (*BESF*) and “ ‘Other List’ for the Benefit Estimate Habitat File” (*OLBEHF*) through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
STAND_WATER	Number (Byte) -	
STAND_WATER_MEMO	Memo	-
BAY	Number (Byte) -	
BAY_MEMO	Memo	-
MARINE	Number (Byte) -	
MARINE_MEMO	Memo	-
RIVER	Number (Byte) -	
RIVER_MEMO	Memo	-
GREAT_LAKE	Number (Byte) -	
GREAT_LAKE_MEMO	Memo	-
OTHER_MEMO	Memo	-
SPECIES_MEMO	Memo	-

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID

OLBEHF - Other List for BEHF File

This table contains habitat information other than that listed in the *BEHF* file for a given benefit estimate. This table links to the *BEHF* file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
OTHER	Text	20

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID
 OTHER

Key
 STUDY_ID
 BEN_EST_ID

SPECIES

BESF - Benefit Estimate, Species File

This table contains species information associated with a given benefit estimate. This table links to the *BEHF* file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
SPECIES	Text	35

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
SPECIES
Key
STUDY_ID
BEN_EST_ID

FISHING MODE AND RESTRICTIONS

BEFMF - Benefit Estimate, Fishing Mode File

This table contains fishing mode information associated with a given benefit estimate. This table links to the *OLBEFMF* and *FRLBEFMF* files through the STUDY_ID and BEN_EST_ID fields, for those estimates with multiple regulations and otherwise unspecified fishing modes.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
SHORE	Number (Byte) -	
SHORE_MEMO	Memo	-
PRIVATE_BOAT	Number (Byte) -	
PRIVATE_BOAT_MEMO	Memo	-
CHART_BOAT	Number (Byte) -	
CHART_BOAT_MEMO	Memo	-
GENERAL_BOAT	Number (Byte) -	
GENERAL_BOAT_MEMO	Memo	-
FLY	Number (Byte) -	
FLY_MEMO	Memo	-
ICE	Number (Byte) -	
ICE_MEMO	Memo	-
OTHER_MEMO	Memo	-
FISH_REG_MEMO	Memo	-

Indices PrimaryKey
STUDY_ID
BEN_EST_ID

OLBEFMF - Other List for BEFMF File

This table lists fishing modes other than that listed in the *BEFMF* file associated with a given benefit estimate. This table links to the *BEFMF* file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
OTHER	Text	100

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
OTHER
Key
STUDY_ID
BEN_EST_ID

FRLBEFMF - Fishing Regulation List for BEFMF File

This table lists fishing regulation(s) associated with a given benefit estimate. This table links to the *BEFMF* file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
FISH_REG	Text	75

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
FISH_REG
Key
STUDY_ID
BEN_EST_ID

SOCIOECONOMIC CHARACTERISTICS

BESEF - Benefit Estimate, Socioeconomic File

This table contains socioeconomic information associated with a given benefit estimate. This table links to the *ALBESEF* file through the STUDY_ID and BEN_EST_ID fields, for those estimates with multiple avidity/experience attributes.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
INCOME	Number (Single) -	
INCOME_MEMO	Memo	-
EDUCATION	Number (Single) -	
EDUCATION_MEMO	Memo	-
AGE	Number (Single) -	
AGE_MEMO	Memo	-
GENDER	Number (Single) -	
GENDER_MEMO	Memo	-
RES_NONRES	Text	2
RES_NONRES_MEMO	Memo	-
RACE	Number (Single) -	
RACE_MEMO	Memo	-
AVID_EXP_MEMO	Memo	-

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID

ALBESEF - Avidity/Experience List for BESEF File

This table lists measures of avidity/experience associated with a given benefit estimate. This table links to the *BESEF* file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
AVID_EXP	Text	100

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID
 AVID_EXP
 Key
 STUDY_ID
 BEN_EST_ID

SITE QUALITY

BESQF - Benefit Estimate, Site Quality File

This table contains site quality information associated with a given benefit estimate. This table links to the **HQCLBESQF** file through the STUDY_ID and BEN_EST_ID fields, for those estimates with multiple high quality attributes.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer)	-
BEN_EST_ID	Number (Integer)	-
MEAN_CATCH	Number (Single)	-
MEAN_CATCH_MEMO	Memo	-
TRIP	Number (Byte)	-
TRIP_MEMO	Memo	-
HOUR	Number (Byte)	-
HOUR_MEMO	Memo	-
DAY	Number (Byte)	-
DAY_MEMO	Memo	-
YEAR	Number (Byte)	-
YEAR_MEMO	Memo	-
SEASON	Number (Byte)	-
SEASON_MEMO	Memo	-
PERSON	Number (Byte)	-
PERSON_MEMO	Memo	-
HIGH_BY_AUTHOR	Number (Byte)	-
HIGH_BY_AUTHOR_MEMO	Memo	-
HIGH_CHAR_MEMO	Memo	-
OTHER_QUAL_ATTR	Text	175
OTHER_QUAL_ATTR_MEMO	Memo	-

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID

HQCLBESQF - High Quality Characteristics List for BESQF File

This table contains high quality characteristic information associated with a given benefit estimate. This table links to the **BESQF** file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer)	-
BEN_EST_ID	Number (Integer)	-
HI_CHAR	Text	100

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID
 HI_CHAR
 Key
 STUDY_ID
 BEN_EST_ID

DATA COLLECTION/STUDY TYPE

BEDF - Benefit Estimate, Data File

This table contains methodological information relevant to a given benefit estimate.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer)	-
BEN_EST_ID	Number (Integer)	-
BEGIN_DATE	Text	15
BEGIN_DATE_MEMO	Memo	-
END_DATE	Text	15
END_DATE_MEMO	Memo	-
SAMP_SIZE	Number (Single)	-
SAMP_SIZE_MEMO	Memo	-
ORIG_ZONES	Number	-
ORIG_ZONES_MEMO	Memo	-
DEST_ZONES	Number	-
DEST_ZONES_MEMO	Memo	-
CHOICE_OCC	Number	-
CHOICE_OCC_MEMO	Memo	-
METHOD	Number (Byte)	-
METHOD_MEMO	Memo	-

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID

ESTIMATE

BEEF - Benefit Estimate, Estimate File

This table contains information on the statistical attributes of a given benefit estimate.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer)	-
BEN_EST_ID	Number (Integer)	-
CS_WELF_VAL	Number (Single)	-
CS_WELF_VAL_MEMO	Memo	-
YEAR_OF_EST	Number (Integer)	-
YEAR_OF_EST_MEMO	Memo	-
IND_EST	Yes/No	1
IND_EST_MEMO	Memo	-
STAND_ERR	Number (Single)	-
STAND_ERR_MEMO	Memo	-
STAND_ERR_MEAN	Number (Byte)	-
STAND_ERR_MEAN_MEMO	Memo	-
SELECT	Text	2
SELECT_MEMO	Memo	-

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID

ESTIMATE UNITS

BEEUF - Benefit Estimate, Estimate Units File

This table contains information on the units associated with a given benefit estimate. This table links to the *OLBEEUF* file through the STUDY_ID and BEN_EST_ID fields, for those estimates with units not specified in *BEEUF*.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
AVE_TOT_CAUGHT	Yes/No	1
AVE_TOT_CAUGHT_MEMO	Memo	-
PER_TOT_CAUGHT	Number (Byte) -	
PER_TOT_CAUGHT_MEMO	Memo	-
AVE_TOT_KEPT	Yes/No	1
AVE_TOT_KEPT_MEMO	Memo	-
PER_TOT_KEPT	Number (Byte) -	
PER_TOT_KEPT_MEMO	Memo	-
AVE_TOT_DAY	Yes/No	1
AVE_TOT_DAY_MEMO	Memo	-
AVE_TOT_TRIP	Yes/No	1
AVE_TOT_TRIP_MEMO	Memo	-
AVE_TOT_YEAR	Yes/No	1
AVE_TOT_YEAR_MEMO	Memo	-
AVE_TOT_SEASON	Yes/No	1
AVE_TOT_SEASON_MEMO	Memo	-
AVE_MGL_CAUGHT	Yes/No	1
AVE_MGL_CAUGHT_MEMO	Memo	-
PER_MGL_CAUGHT	Number (Byte) -	
PER_MGL_CAUGHT_MEMO	Memo	-
AVE_MGL_KEPT	Yes/No	1
AVE_MGL_KEPT_MEMO	Memo	-
PER_MGL_KEPT	Number (Byte) -	
PER_MGL_KEPT_MEMO	Memo	-
AVE_MGL_DAY	Yes/No	1
AVE_MGL_DAY_MEMO	Memo	-
AVE_MGL_TRIP	Yes/No	1
AVE_MGL_TRIP_MEMO	Memo	-
AVE_MGL_YEAR	Yes/No	1
AVE_MGL_YEAR_MEMO	Memo	-
AVE_MGL_SEASON	Yes/No	1
AVE_MGL_SEASON_MEMO	Memo	-
OTHER_MEMO	Memo	-

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID

OLBEEUF - Other List for BEEUF File

This table lists units information other than that specified in the **BEEUF** file. This table links to the **BEEUF** file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
OTHER	Text	100

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
OTHER
Key
STUDY_ID
BEN_EST_ID

MEAN UNIT VALUES

BEMUVF - Benefit Estimate, Mean Unit Values File

This table contains fishing effort (mean unit value) information associated with a given benefit estimate. This table links to the **OLBEMUVF** file through the STUDY_ID and BEN_EST_ID fields, for those estimates with mean values not specified in **BEMUVF**.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
FISH_DAY/YEAR	Number (Single) -	
FISH_DAY/YEAR_MEMO	Memo	-
DAY/TRIP	Number (Single) -	
DAY/TRIP_MEMO	Memo	-
FISH_TRIP/YEAR	Number (Single) -	
FISH_TRIP/YEAR_MEMO	Memo	-
FISH_TRIP/SEASON	Number (Single) -	
FISH_TRIP/SEASON_MEMO	Memo	-
SEASON_LEN	Number (Single) -	
SEASON_LEN_MEMO	Memo	-
DAY/SEASON	Number (Single) -	
DAY/SEASON_MEMO	Memo	-
OTHER_MEMO	Memo	-

Indices PrimaryKey
STUDY_ID
BEN_EST_ID

OLBEMUVF - Other List for BEMUVF File

This table lists fishing effort (mean unit value) information other than that specified in the **BEMUVF** file. This table links to the **BEMUVF** file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
OTHER	Text	100

<i>Indices</i>	<u>PrimaryKey</u>
	STUDY_ID BEN_EST_ID OTHER
	<u>Key</u>
	STUDY_ID BEN_EST_ID

BASELINE/ALTERNATIVE

BEBAF - Benefit Estimate, Baseline/Alternative File

This table contains all information relevant to the baseline and change in resource associated with a given benefit estimate.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
ALL_NOTH_QUO	Yes/No	1
ALL_NOTH_QUO_MEMO	Memo	-
QUO_DEF	Text	175
QUO_DEF_MEMO	Memo	-
BASE_MEASURE	Number (Byte) -	
BASE_MEASURE_MEMO	Memo	-
BASE_STUDY	Number (Byte) -	
BASE_STUDY_MEMO	Memo	-
BASE_DEF	Text	100
BASE_DEF_MEMO	Memo	-
CHANGE_IN_RES	Text	150
CHANGE_IN_RES_MEMO	Memo	-
POINT_CHANGE	Text	30
POINT_CHANGE_MEMO	Memo	-

<i>Indices</i>	<u>PrimaryKey</u>
	STUDY_ID BEN_EST_ID

SURVEY CHARACTERISTICS

MSCF - Methodology, Survey Characteristics File

This table contains survey instrument characteristic information associated with a given benefit estimate. This table links to the *OLMSCF* file through the STUDY_ID and BEN_EST_ID fields for other, unspecified characteristics.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
MAIL	Number (Byte) -	
MAIL_MEMO	Memo -	
PHONE	Number (Byte) -	
PHONE_MEMO	Memo -	
PERSON	Number (Byte) -	
PERSON_MEMO	Memo -	
RESP_RATE	Number (Single) -	
RESP_RATE_MEMO	Memo -	
PERC_CONT	Number (Byte) -	
PERC_CONT_MEMO	Memo -	
PERC_TOT	Number (Byte) -	
PERC_TOT_MEMO	Memo -	
OTHER_MEMO	Memo -	

Indices PrimaryKey
STUDY_ID
BEN_EST_ID

OLMSCF - Other List for MSCF File

This table lists survey characteristic information other than that specified in the *MSCF* file. This table links to the *MSCF* file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
OTHER	Text	20

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
OTHER
Key
STUDY_ID
BEN_EST_ID

METHODOLOGY

MMF - Methodology, Methodology File

This table contains estimation routine information associated with a given benefit estimate.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
ESTIMATOR	Text	25
ESTIMATOR_MEMO	Memo	-
LHS_FUNCT_FORM	Text	25
LHS_FUNCT_FORM_MEMO	Memo	-

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID

CONTINGENT VALUATION

MCVF - Methodology, Contingent Valuation File

This table contains study methodology information for each contingent valuation benefit estimate. This table links to the *SVLMCVF* and *PVMCVF* files through the STUDY_ID and BEN_EST_ID fields for those estimates with multiple substitute variables and payment vehicles.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer) -	
BEN_EST_ID	Number (Integer) -	
SUBST_VAR_MEMO	Memo	-
PAYMENT_MEMO	Memo	-
WTP/WTA	Yes/No	1
WTP/WTA_MEMO	Memo	-
TRIMMED	Number (Byte) -	
TRIMMED_MEMO	Memo	-
TYPE	Number (Byte) -	
TYPE_MEMO	Memo	-
SINGL_BOUND	Number (Byte) -	
SINGL_BOUND_MEMO	Memo	-
ANCHOR	Number (Byte) -	
ANCHOR_MEMO	Memo	-
WTP_AMT	Number (Byte) -	
WTP_AMT_MEMO	Memo	-
NON_DICH_CHOICE	Number (Byte) -	
NON_DICH_CHOICE_MEMO	Memo	-
PRED_METHOD	Number (Byte) -	
PRED_METHOD_MEMO	Memo	-
DICH_CHOICE	Number (Byte) -	
DICH_CHOICE_MEMO	Memo	-
TRUNC	Number (Byte) -	
TRUNC_MEMO	Memo	-
UPPER_TRUNC	Number (Single) -	

MCVF - Methodology, Contingent Valuation File (continued)

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
UPPER_TRUNC_MEMO	Memo	-
LOWER_TRUNC	Number (Single)	-
LOWER_TRUNC_MEMO	Memo	-

Indices PrimaryKey
STUDY_ID
BEN_EST_ID

SVLMCVF - Substitute Variables List for MCVF File

This table contains substitute variable information associated with a given contingent valuation benefit estimate. This table links to the *MCVF* file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer)	-
BEN_EST_ID	Number (Integer)	-
SUBST_VAR	Text	190

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
SUBST_VAR

Key
STUDY_ID
BEN_EST_ID

PVLMCVF - Payment Vehicle List for MCVF File

This table contains payment vehicle information associated with a given contingent valuation estimate. This table links to the *MCVF* file through the STUDY_ID and BEN_EST_ID fields.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer)	-
BEN_EST_ID	Number (Integer)	-
PAYMENT	Text	75

Indices PrimaryKey
STUDY_ID
BEN_EST_ID
PAYMENT
Key
STUDY_ID
BEN_EST_ID

TRAVEL COST

MTCF - Methodology, Travel Cost File

This table contains study methodology information for each travel cost benefit estimate.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer)	-
BEN_EST_ID	Number (Integer)	-
TRAV_COST_TYPE	Number (Byte)	-
TRAV_COST_TYPE_MEMO	Memo	-
OPP_COST_INCL	Yes/No	1
OPP_COST_INCL_MEMO	Memo	-
OPP_COST	Text	125
OPP_COST_MEMO	Memo	-
TRAVEL_TIME	Number (Single)	-
TRAVEL_TIME_MEMO	Memo	-
TRAVEL_TIME_UNIT	Text	15
TRAVEL_TIME_UNIT_MEMO	Memo	-
DEPEN_VAR_TYPE	Number (Byte)	-
DEPEN_VAR_TYPE_MEMO	Memo	-
ZONE_TYPE	Number (Byte)	-
ZONE_TYPE_MEMO	Memo	-
NEST_STR_DECR	Text	150
NEST_STR_DECR_MEMO	Memo	-

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID

CONTINGENT VALUATION/TRAVEL COST

MRHSF - Methodology, RHS File

This table contains independent variable information for all contingent valuation and travel cost equations.

<u>Field Name</u>	<u>Type</u>	<u>Length</u>
STUDY_ID	Number (Integer)	-
BEN_EST_ID	Number (Integer)	-
INCOME	Number (Byte)	-
INCOME_MEMO	Memo	-
EDUCATION	Number (Byte)	-
EDUCATION_MEMO	Memo	-
AGE	Number (Byte)	-
AGE_MEMO	Memo	-
GENDER	Number (Byte)	-
GENDER_MEMO	Memo	-
RACE	Number (Byte)	-
RACE_MEMO	Memo	-
QUALITY_1	Number (Byte)	-
QUALITY_1_MEMO	Memo	-
QUALITY_2	Number (Byte)	-
QUALITY_2_MEMO	Memo	-
SUBST_PRICE	Number (Byte)	-
SUBST_PRICE_MEMO	Memo	-
OTHER_SUBST	Number (Byte)	-
OTHER_SUBST_MEMO	Memo	-
TRAVEL_COST	Number (Byte)	-
TRAVEL_COST_MEMO	Memo	-
AVID_EXP	Number (Byte)	-
AVID_EXP_MEMO	Memo	-
OTHER	Number (Byte)	-
OTHER_MEMO	Memo	-
DICH_CHOICE_BID	Number (Byte)	-
DICH_CHOICE_BID_MEMO	Memo	-
START_BID	Number (Byte)	-
START_BID_MEMO	Memo	-

Indices PrimaryKey
 STUDY_ID
 BEN_EST_ID

Appendix B

DATABASE OF SPORT FISHING VALUES CODING SHEET

DATABASE OF SPORT FISHING VALUES CODING SHEET
General Study Characteristics

Field	Description	Format	Value	Memo
Citation:				
1.0a	Study Code	number		
1.0b	Comment	text		
1.1	Author Enhanced Coding Sheet?	1/0		
1.2a	Source of Data	text		
1.2b	Data Originally Used in this Study?	1/0		
1.3	Other studies using data	text		
1.4	Author	text		
1.5	Title	text		
1.6	Source	text		
1.7	Volume	number		
1.8	Date (mmddy)	number		
1.9	Page (begin-end)	number		
1.10	Publisher (if appropriate)	text		
1.11	Literature Type (e.g., journal, technical reports, working papers, government, dissertation/thesis)	list		
Welfare Estimate Number:		number		
Geographic Location:				
2.1	National	1/0		

DATABASE OF SPORT FISHING VALUES CODING SHEET
General Study Characteristics

Field	Description	Format	Value	Memo
Geographic Location (continued):				
2.2	Multi-State Region	1/0		
2.3	Sub State Region	1/0		
2.3a	Sub State Description (if 2.3=1)	list		
2.4	State List	State abbreviation		
2.5	County	1/0		
2.5a	County Name (if 2.5=1)	list		
2.6	Site Name	list		
2.7	Site Description	individual resource= 1 multiple resource = 0 other = -1		
Habitat/Water Type:				
3.1	Standing Water (Lake, Pond, Reservoir)	1/0		
3.2	Estuary or Bay	1/0		
3.3	Marine (Open Ocean)	1/0		
3.4	River	1/0		
3.5	Great Lakes	1/0		
3.6	Other	list		
Species:				
4.1	Species	list if multiple, identify group (e.g., coldwater, warm water) or major species (e.g., trout, salmon)		

DATABASE OF SPORT FISHING VALUES CODING SHEET
General Study Characteristics

Field	Description	Format	Value	Memo
Fishing Mode and Restrictions:				
5.1	Shore (pier, breakwater)	1/0		
5.2a	Boat (privately owned)	1/0		
5.2b	Boat (charter, party guided)	1/0		
5.2c	Boat (general)	1/0		
5.3	Fly Fishing	1/0		
5.4	Ice Fishing	1/0		
5.5	Other	list		
5.6	Fishing Regulations (e.g., catch and release)	list		
Socioeconomic Characteristics:				
6.1	Income (Mean)	number		
6.2	Education (Mean)	number (years)		
6.3	Age (Mean)	number		
6.4	Gender (Mean)	mean value where M=0, F=1		
6.5	Residents/ Non-Residents/Both	1,-1,0		
6.6	Race	mean value where white=0, non-white=1		
6.7	Avidity / Experience Characteristics listed in Study	list		
Site Quality:				
7.1	Mean Catch Rate	number		

DATABASE OF SPORT FISHING VALUES CODING SHEET
General Study Characteristics

Field	Description	Format	Value	Memo
Site Quality: (continued)				
	Catch Rate Units:			
7.2a	per trip	1/0		
7.2b	per hour	1/0		
7.2c	per day	1/0		
7.2d	per year	1/0		
7.2e	per season	1/0		
7.2f	per person	1/0		
7.3	Site Identified as High Quality by Author	1/0		
7.3a	High Quality Characteristics (if 7.3=1)	list		
7.4	Other Quality Attributes Listed in Study	text		
Data Collection:				
8.1	Data Collection Begin Date	text		
8.2	Data Collection End Date	text		
8.3	Number of Respondents	number		
8.4a	Number of Origin Zones (if Zonal Travel Cost)	number		
8.4b	Multiple Destination Zones? (1 if yes, 0 if single)	1/0		
8.5	Number of choice occasions	number		
Study Type:				
9.1	Valuation Methodology	Contingent Valuation = 1 Travel Cost = 0		

DATABASE OF SPORT FISHING VALUES CODING SHEET
Welfare Estimate

Field	Description	Format	Value	Memo
Welfare Estimate:				
10.1	Consumer Surplus Estimate	number		
10.1a	Year of Welfare Estimate Dollars	date		
10.1b	Individual Estimate	1/0		
10.2a	Standard Error of Mean Reported?	1/0		
10.2b	Variability of Welfare Estimate (of 10.1)	number		
10.3	Estimate Selection	author - stated criteria = 1 only estimate reported = 0 study group protocol = -1		
Estimate Units:				
11.1	Ave. Total CS/fish caught	1/0		
11.1a	Per day, trip, year, season	1, 2, 3, 4		
11.2	Ave. Total CS/fish kept	1/0		
11.2a	Per day, trip, year, season	1, 2, 3, 4		
11.3	Ave. Total CS/day	1/0		
11.4	Ave. Total CS/trip	1/0		
11.5	Ave. Total CS/year	1/0		
11.6	Ave. Total CS/season	1/0		
11.7	Ave. Mgl. CS/fish caught	1/0		
11.7a	Per day, trip, year, season	1, 2, 3, 4		

DATABASE OF SPORT FISHING VALUES CODING SHEET
Welfare Estimate

Field	Description	Format	Value	Memo
Estimate Units: (continued)				
11.8	Ave. Mgl. CS/fish kept	1/0		
11.8a	Per day, trip, year, season	1, 2, 3, 4		
11.9	Ave. Mgl. CS/day	1/0		
11.10	Ave. Mgl. CS/trip	1/0		
11.11	Ave. Mgl. CS/season	1/0		
11.12	Ave. Mgl. CS/year	1/0		
11.13	Other	list		
Fishing Effort (Mean Unit Values):				
12.1	Fishing days/year	number		
12.2	Fishing days/trip	number		
12.3	Fishing trips/year	number		
12.4	Fishing trips/season	number		
12.5	Season length	number		
12.6	Days/season	number		
12.7	Other	list		
Baseline/Alternative:				
13.1	All or Nothing Consumer Surplus	1/0		
13.1a	Status Quo Definition	text		

DATABASE OF SPORT FISHING VALUES CODING SHEET
Welfare Estimate

Field	Description	Format	Value	Memo
Baseline/Alternative: (continued)				
Marginal Change Studies (13.1=0):				
13.2a	Baseline Defined for Measurement	1/0		
13.2b	Baseline Reported in Study	1/0		
13.2c	Baseline Definition	text		
13.2d	Change in Resource	text		
13.2e	Point Estimate of Change (e.g. - 50%, +50%,)	number		

DATABASE OF SPORT FISHING VALUES CODING SHEET

Methodology

Field	Description	Format	Value	Memo
Survey Characteristics (where data derive from):				
14.1	Mail Survey	1/0		
14.2	Phone Survey	1/0		
14.3	In-Person Interview	1/0		
14.4	Survey Response Rate	number		
14.4a	Percent of Deliverables	1/0		
14.4b	Percent of Total	1/0		
14.5	Other (e.g. Usables)	list		
Methodology:				
15.1	Estimator	0-8 (see page CV-2 if 9.1=1, see pages TC-1 and TC-2 if 9.1=0)		
15.2	LHS Functional Form	0-2 (See page CV-2 if 9.1=1, see page TC-2 if 9.1=0)		
Contingent Valuation - See Decision Tree, Page B-15:				
	Survey Information			
16.1a	Substitute Variables (i.e., quality, quantity, or general presence)	list		
16.1b	Payment Vehicle	list (e.g., one time payment, tax, contribution)		
16.1c	WTP? (vs. WTA)	1/0		
16.1d	Trimmed Data?	1/0		
16.2	Question Type	1,21,23,24,25,3,4,5		
16.3	Single Bounded (if 16.2 = 1,21)	1/0		

DATABASE OF SPORT FISHING VALUES CODING SHEET

Methodology

Field	Description	Format	Value	Memo
Contingent Valuation: (continued)				
16.4	Anchoring (if 16.2 = 5, 25)	1/0		
16.5	WTP Amount Coding (if 16.2=5, 25)	midpoints=1 endpoints=2 other=3		
16.6	Non Dichotomous Choice CV Estimator (16.2≠1)	1=mean 2=median 3=predicted		
16.6a	Predicted Method (if 16.6=3)	1=individual 2=mean 3=median		
16.7	Dichotomous Choice Approach (if 16.2=1)	1=Hanemann or Truncated Mean 0=Cameron Estimator or Hanemann Median		
16.8	Truncation (if 16.7=1)	1=Truncation at zero 0=Negative value truncation point		
16.8a	Upper Truncation Percentile	Number		
16.8b	Lower Truncation Percentile (if 16.8=0)	Number		
Independent Variables				
16.9a	Income	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9b	Education	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		

DATABASE OF SPORT FISHING VALUES CODING SHEET
Methodology

Field	Description	Format	Value	Memo
Contingent Valuation: (continued)				
16.9c	Age	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9d	Gender	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9e	Race	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9f(1)	Quality Variable 1	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9f(2)	Quality Variable 2	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9g	Substitute Prices	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		

DATABASE OF SPORT FISHING VALUES CODING SHEET
Methodology

Field	Description	Format	Value	Memo
Contingent Valuation (continued)				
16.9h	Other Substitute Variable	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9i	Dichotomous Choice Bid (if 16.2=1, 21)	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9j	Starting Bid (if 16.2=4, 24)	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9k	Avidity/Experience	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
16.9l	Other	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		

DATABASE OF SPORT FISHING VALUES CODING SHEET
Methodology

Field	Description	Format	Value	Memo
Travel Cost - See Decision Tree, Page B-17:				
17.1	Travel Cost Type	1,2,3		
17.2	Opportunity Cost of Travel Time Included?	1/0		
17.2a	Opportunity Cost	text		
17.3	Travel Time	number		
17.4	Travel Time Units	text		
17.5	Dependent Variable Type (if 17.1=1 or 2)	trips=1 days=2 other=3		
17.6	Zonal Type (if 17.1=1)	grouped=1 individual=2		
17.7	Nesting Structure (if 17.1=3)	text		
Independent Variables				
17.8a	Income	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
17.8b	Education	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		

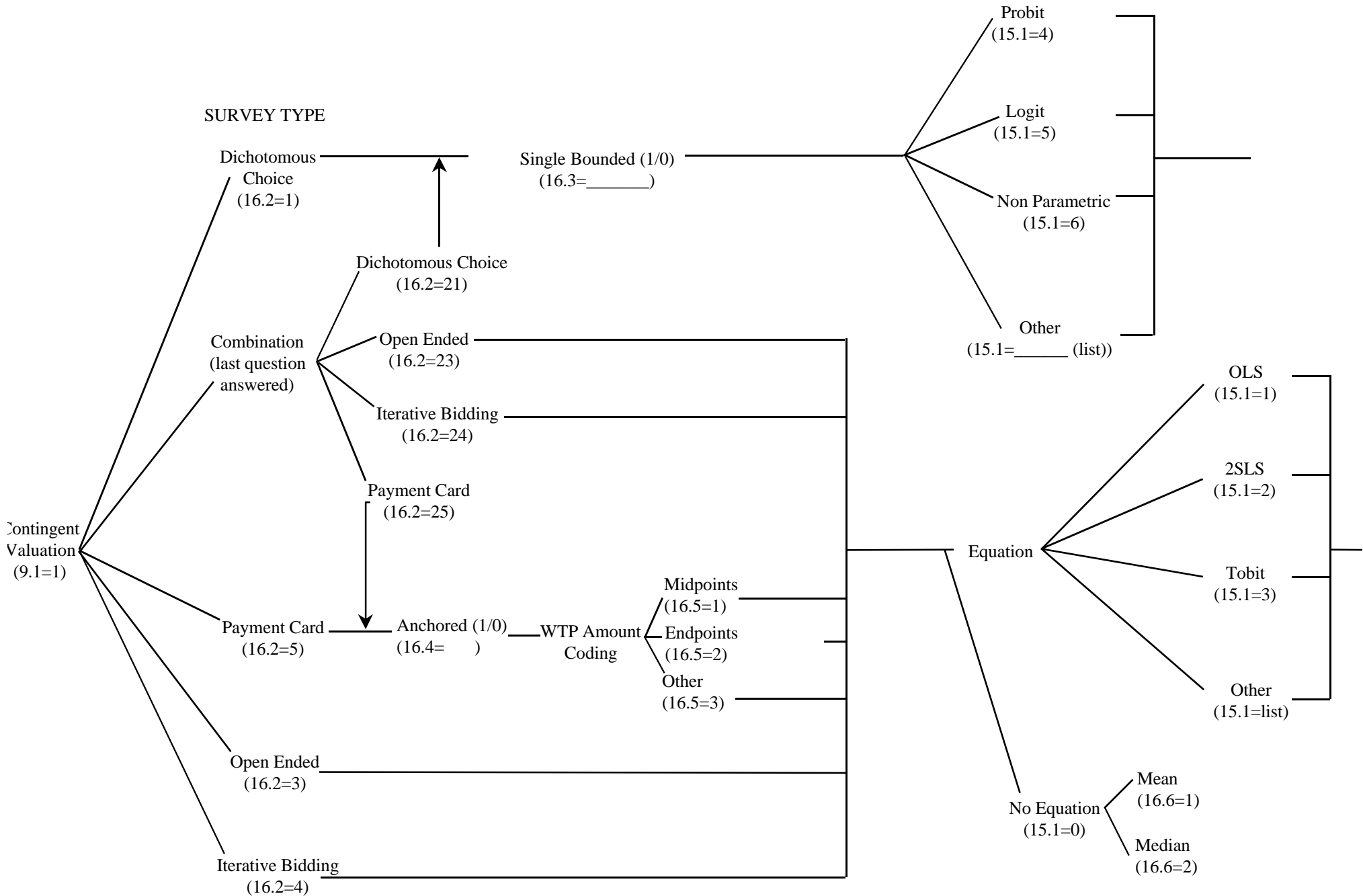
DATABASE OF SPORT FISHING VALUES CODING SHEET
Methodology

Field	Description	Format	Value	Memo
Travel Cost: (continued)				
17.8c	Age	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
17.8d	Gender	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
17.8e	Race	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
17.8f(1)	Quality Variable1	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
17.8f(2)	Quality Variable 2	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
17.8g	Substitute Prices	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		

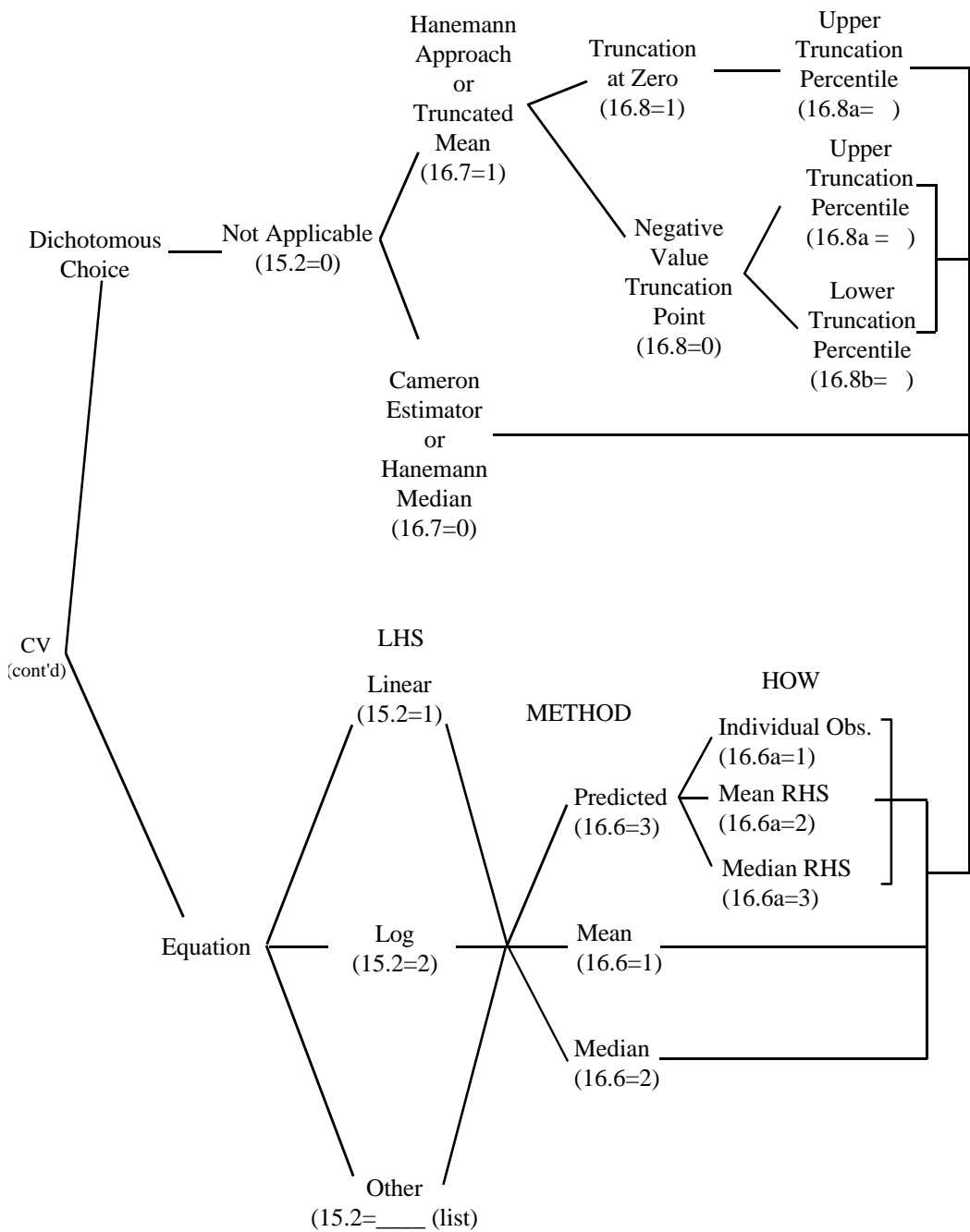
DATABASE OF SPORT FISHING VALUES CODING SHEET
Methodology

Field	Description	Format	Value	Memo
Travel Cost: (continued)				
17.8h	Other Substitute Variables	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
17.8i	Travel Cost	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
17.8j	Avidity/Experience	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		
17.8k	Other	not included = 0 linear = 10, 11 log = 20, 21 interaction = 30, 31 square = 40, 41 other = 50, 51		

CONTINGENT VALUATION

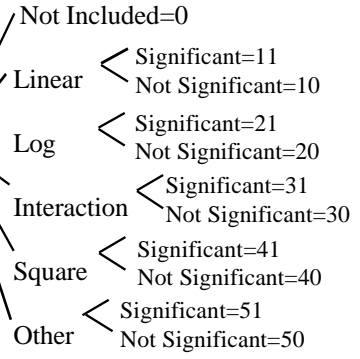


CONTINGENT VALUATION

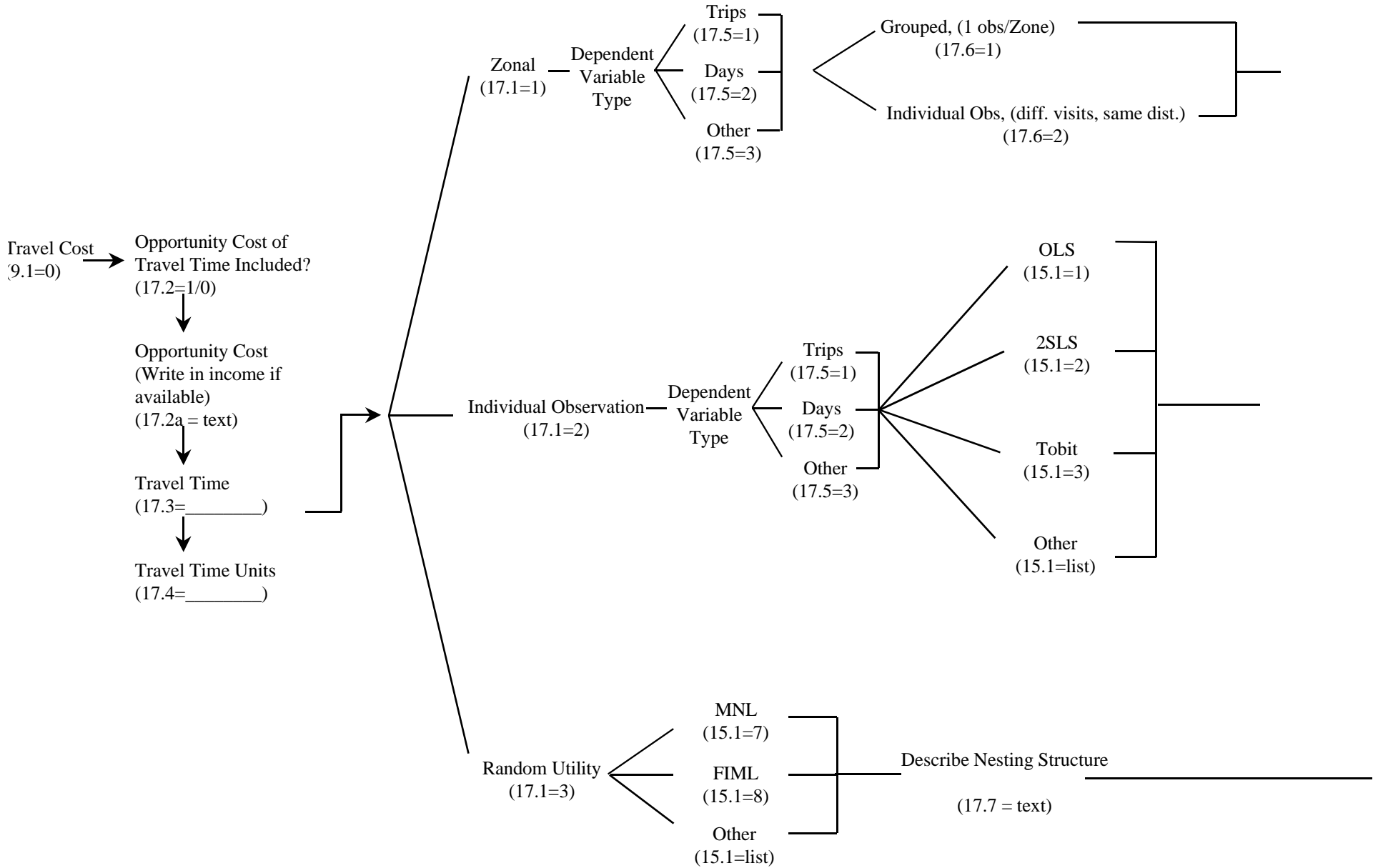


Key RHS Variables

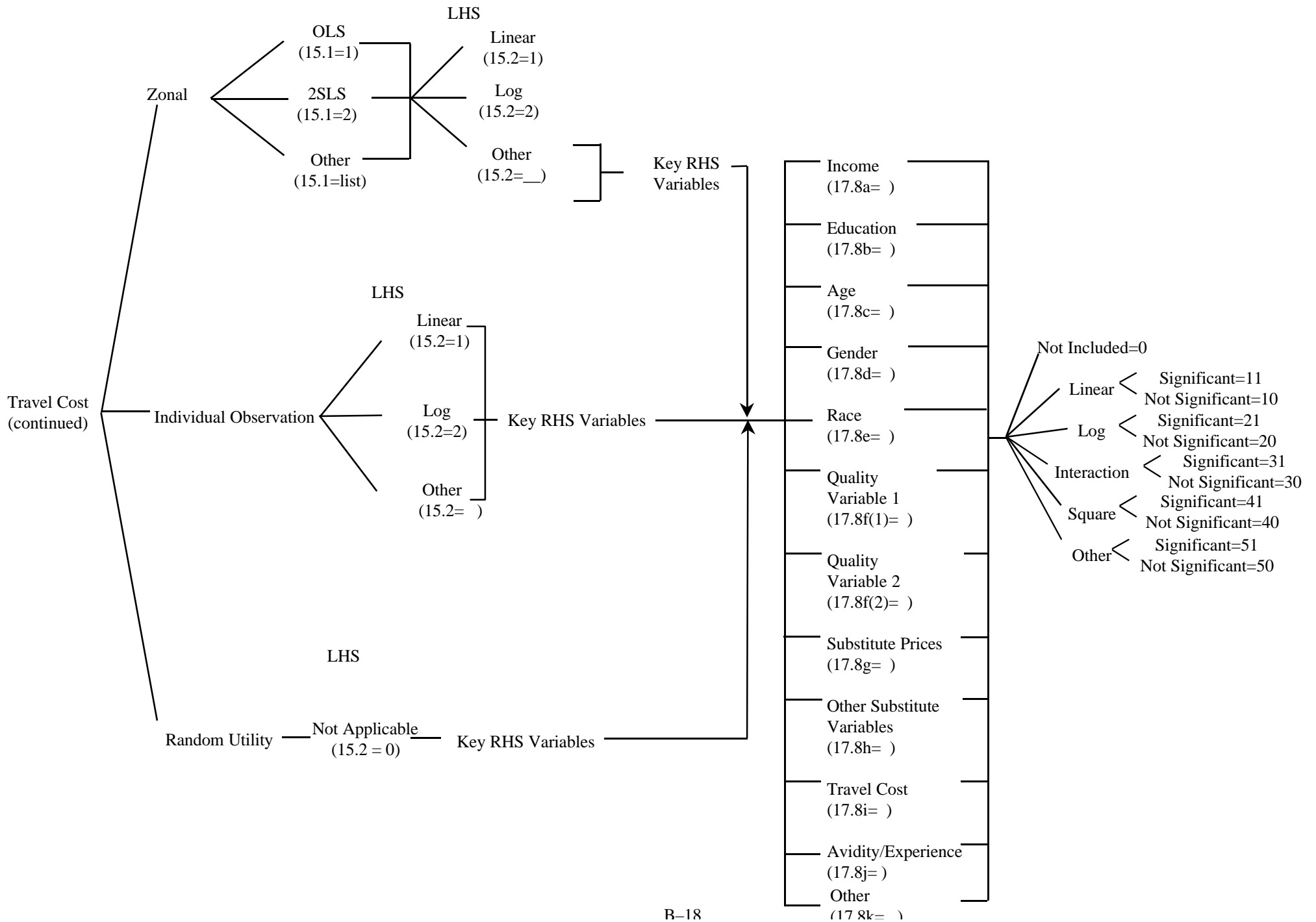
Income (16.9a=)	
Education (16.9b=)	
Age (16.9c=)	
Gender (16.9d=)	
Race (16.9e=)	
Quality Variable1 (16.9f(1)=)	
Quality Variable2 (16.9f(2)=)	
Substitute Prices (16.9g=)	
Other Substitute Variables (16.9h=)	
Dich. Choice Bid (if 16.2=1, 21) (16.9i=)	
Starting Bid (if 16.2=4, 24) (16.9j=)	
Avidity/Experience (16.9k=)	
Other (16.9l=)	



TRAVEL COST



TRAVEL COST



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