User's Guide to the Policy Interface for the Michigan Recreational Fishing Demand Model

Version 1.1

June 1997

Send comments to Lupi@pilot.msu.edu

Frank Lupi, John P. Hoehn, and Thomas N. Moen
Department of Agricultural Economics
Michigan State University
East Lansing, Michigan  48824-1039

Staff Paper Number 97-56, Department of Agricultural Economics, Michigan State University.

© by Frank Lupi, John P. Hoehn, and Thomas N. Moen. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means provided that this copyright notice appears on all such copies.
User's Guide to the Policy Interface for the Michigan Recreational Fishing Demand Model

Frank Lupi, John P. Hoehn, and Thomas N. Moen
June 1997

Contents

Acknowledgements ........................................................ iii
What is the Policy Interface, and What Does It Do? ................................ 1
Some Terms You'll Need to Know (Definitions) .................................. 4
Steps for Creating and Running Policy Scenarios ................................. 6
Creating Policy Scenarios (Step 1) ............................................. 6
Scenario Information (Step 2) .................................................. 7
Editing Data Values (Step 3) .................................................... 8
Check Data (Step 4) .............................................................. 9
Run the Scenario (Step 5) ....................................................... 10
Other Interface Features ....................................................... 12
Summary of Command Buttons ................................................ 14
Tips for Editing Data and Moving Around in the Spreadsheets .................. 15
Technical Requirements ......................................................... 16
Installation ........................................................................ 17

Figures

Cover Untitled (Main Program Screen) ........................................... i
Figure 1 Initial Interface Screen: Scenario File Name and Location ............ 6
Figure 2 Scenario Information Screen ........................................... 7
Figure 3 Elements of the Main Interface Screen .................................. 8
Figure 4 Report of Data Values that were Altered (from Check data button) ............................................. 9
Figure 5 Scenario Run Report (View of First Page) ................................. 10
Figure 6 Scenario Run Report (View of Second Page) ........................... 11
Figure 7 Michigan County Map Locator Feature ................................ 12

1 Department of Agricultural Economics, Michigan State University, East Lansing, MI 48824-1039.

2 Institute for Water Resources, Michigan State University, East Lansing, MI 48823-5243.
Acknowledgements

The Michigan Recreational Fishing Demand Model was developed by a team of researchers at Michigan State University with funding from the Environmental Response Division of the Michigan Department of Environmental Quality (DEQ) and the Fisheries Division of the Michigan Department of Natural Resources (DNR). The principal investigators of the project were John P. Hoehn and Theodore Tomasi. Frank Lupi and Heng Z. Chen were project collaborators. The computer routines used by the interface to run the trip prediction and benefit estimation routines were originally written by Heng Z. Chen. Thanks are due to Brian Monroe of DEQ and Douglas B. Jester of DNR for their suggestions regarding the interface.

This guide is not intended as a description of the economic theory underlying the demand model, nor is it a guide to the proper use of such a model. The complete details of the demand model can be found in the following project report:

What is the Policy Interface, and What Does It Do?

The "Policy Interface" is a windows-based computer program that runs the Michigan Recreational Fishing Demand Model (MRFDM). The Policy Interface makes it easy to run the MRFDM. The MRFDM itself is a complex, multi-layered statistical model. The Policy Interface permits an analyst to run the MRFDM without specialized computer programming skills and without learning about the underlying data files. The Policy Interface allows an analyst to:

- create and edit the data files needed for running the MRFDM,
- run the data files through the MRFDM,
- produce reports on policy related changes in recreational fishing trips and their economic benefits, and
- archive the program, data files, and results for future reference.

This user's guide shows how to use the Policy Interface. The guide serves as a supplement to the model training sessions.

What Is the MRFDM?

The MRFDM is a model of the economic demand for recreational fishing in Michigan. Economic demands are relationships between the cost of a fishing trip and where and how often anglers go fishing. The cost of fishing is based on an index of travel costs. Data on travel costs, where anglers go fishing, and how often they go came from a statewide, season long survey of Michigan anglers. A nested-logit statistical model was used to summarize the information contained in the data. The result was the MRFDM.

The purpose of the MRFDM is to estimate how the destinations, frequency of travel, and the economic benefits of fishing change as site conditions change with public policies. The measure of economic benefits is restricted to the values associated with angler's choices of which fishing site to visit. These benefits are called angling use-values. Use-values refer to the economic value anglers receive from fishing at one site as opposed to fishing at some other site. This is an economic value above and beyond the amount anglers spend.

Values that are not related to the use of a site by anglers are not measured by angling use-values. Benefits to residents, local merchants, riparian home owners, and Michigan citizens in general are not included in the model. For instance, angling use values do not measure environmental values associated with a site that are held by the general public. In addition, angling use-values do not measure the intrinsic value of fishing. Instead, they measure the economic value of the fishing site chosen by an angler relative to their next best alternative.
The internal structure of the MRFDM links the quality characteristics of fishing sites to the number of trips taken to each of these fishing sites. This linkage allows users to evaluate changes in the characteristics of fishing sites. For example, the catch rate of chinook salmon is a quality characteristic describing each Great Lake fishing site in the model.

Fishing sites and characteristics in the MRFDM are defined at the county level. The model distinguishes fishing trips by trip lengths (single and multiple day trips), by the water body fished at (Great Lakes, inland lakes, or inland rivers), and by the species fished for (warm water species such as bass, perch or walleye versus cold water species such as trout and salmon). The combinations of water bodies and species are referred to as “product lines.” Within each product line, the fishing sites are the counties in Michigan that provide fishing opportunities for that product line.

The MRFDM can be used to predict changes in fishing trips associated with changes in fishing quality. It also translates these changes in fishing trips into changes in anglers’ economic use-value. Any change in the characteristics of fishing sites can be thought of as the result of a "policy." A description of the characteristics of fishing sites "with" and "without" a policy is referred to as a "policy scenario." Each policy scenario run through the MRFDM results in (1) estimated changes in fishing trip patterns and (2) estimated economic benefits or losses.

Overall, here is what goes in and what comes out of the fishing demand model:

INPUT → A policy scenario (user defined changes in the characteristics of fishing sites).

OUTPUT → Estimates of changes in fishing trips and estimates of the economic benefits or losses associated with the policy scenario.

The Policy Interface

The Policy Interface makes it easy to specify a policy scenario and pass it through the MRFDM's computer routines to estimate trip changes and economic benefits. These two steps are referred to as creating and running a policy scenario. Even though the Policy Interface makes it easy to use the MRFDM, the user must bring it a basic understanding of the economic model and knowledge of the variables that they want to alter as a part of their policy scenario.

There are five basic steps for using the Policy Interface to run the fishing demand model:

Step 1: Create a new or open existing policy scenario.

Step 2: Provide scenario information.

- Users provide descriptions of each policy scenario, and the information is printed in the header of all output files.
Step 3: Edit policy variables (fishing site characteristics).

- Users select a product line, and edit the "with" and "without" site characteristics (the proposed and baseline data values).

Step 4: Check data values.

- The program generates a report of any variables that have been changed. The user must verify all changes to the data before running a scenario!

Step 5: Run demand model.

- The scenario is sent to the fishing demand model which generates a report of the estimated statewide benefits (losses) and predicted changes in fishing trips.

These steps are discussed in greater detail in the main part of the user's guide. Prior to doing so, a short review of terms used in the Policy Interface and in this guide is provided.
Some Terms You'll Need to Know (Definitions)

A **policy scenario** is a description of site quality characteristics "with" and "without" a policy.

- The descriptions of the fishing site quality characteristics "with" and "without" a policy are referred to as the **proposed** and **baseline** values, respectively. These values are edited by users to define a policy scenario.
  - The baseline and proposed data values can also be thought of as the characteristics of fishing sites "before" and "after" a policy.

---

The **site quality characteristics** are the variables that describe the fishing sites.

- The catch rate of chinook salmon is an example of a site quality characteristic.

- The fishing site characteristics are the variables that were used to estimate the fishing demand model and are correlated with angler's fishing site choices.

- The data values for the site characteristics are edited to create the policy scenarios.

---

**Fishing sites** are the counties in Michigan that support the alternative types of fishing activities.

---

**Product lines** are types of fishing activities (combinations of water bodies and fish species).

- Water bodies are divided into Great Lakes (including connecting waters), Inland lakes (including impoundments and reservoirs), and inland rivers/streams.

- Species are grouped into **warm** (bass, perch, pike, and walleye) and **cold** (trout and salmon).

- The seven product lines are (see also the display portion of main interface screen, Figure 3):
  - Great Lakes Warm
  - Inland Lakes Warm
  - Rivers Warm
  - Great Lakes Cold
  - Inland Lakes Cold
  - Rivers Cold
  - Rivers Anadromous

---

3 Terms being defined are in **bold** text. Terms appearing on the interface screens are in **italics**.
A *run* refers to the running of a policy scenario within the fishing demand model (the MRFDM).

- When a scenario is *run*, the interface "sends" the scenario to the MRFDM, which is used to estimate changes in fishing trips and changes in angling use value associated with the policy scenario.

The site characteristic "**open**" indicates whether a county supports a product line or not.

- Open can be used to simulate a site closure.
  - Open = 1 means the county is available for fishing within the current product line.
  - Open = 0 means the county is not available for fishing within that product line (**closed**).

A *spreadsheet* (or worksheet) is the set of rows and columns displaying the data values.

- Fishing sites (counties) are listed in the rows of the spreadsheets.
- Site quality characteristics (variables) are listed in the columns.
- There are 3 spreadsheets for each product line (*proposed*, *baseline*, and *default*).
  - *default* refers to the data values used to estimate the model & initialize the spreadsheets.
  - A *view* refers to the data values being presented on the Policy Interface screen (the *baseline*, *proposed*, or *default* data values).
- A *cell* is an entry in a spreadsheet (the intersection of a row and column).

The *current spreadsheet* is a combination of a view and a product line.

- The *current cell* is the spreadsheet cell with the black border (see figure 3).
- The *current variable* (current column) is the variable (column) for the current cell.
  - The top of each column shows the name of the current variable.
  - A long description of the current variable is northwest of the current spreadsheet (see figure 3).
- The *current product line* is the product line whose data is being displayed in the current spreadsheet (as identified by the black dot in the *display* field).
Steps for Creating and Running Policy Scenarios

Creating Policy Scenarios (Step 1)

To create a new policy scenario,
1. Click on the "new" button at the top of the screen (see above figure).
2. Select a folder (directory) where the scenario is to be stored.
3. Identify a file name to save the scenario under.

   The "SCN" file extension must be used. For example, "TEST.SCN" is a valid scenario file name. All files associated with the scenario are managed by the interface. The files will all begin with the same file name (TEST.* in the example) and are placed in the same folder (directory).

To open an existing policy scenario,
1. Click on the "open" button at the top of the screen (see above figure).
2. Select the folder or subdirectory where the scenario was stored.
3. Select the scenario from the existing scenarios displayed on the screen.

   • In figure 1, "DEMO.SCN" is an existing scenario in the "C:\DA01\SCENARIO" folder (directory).

Caution: Creating a new scenario by building on an existing scenario can save time. However, to avoid overwriting the data in the existing scenario, use the "save as" button to rename the scenario before making any edits to the existing scenario.
Scenario Information (Step 2)

Figure 2 displays the information screen that pops up when a scenario is first created or when the info button is clicked. The scenario information feature allows each scenario to be documented, and the information is maintained as a part of the scenario. The information is displayed in the headers for all model outputs and reports. The name and comments are entered by users. The date and time is determined by the computer.

Password: During file creation, users are given the opportunity to assign a password to the scenario. This step is optional. Be cautious with this option. Without the password, the scenario can not be retrieved by the interface. Also note that password only protects against unauthorized access to the scenario through the interface -- a determined individual might find other ways to access the files.

Editor: The information screen also allows the user to select a text editor for displaying all reports. The model reports are ASCII text files. By default the program will use the windows notepad or write programs. If write is used (or if some other word processor is used), files might be converted to formats using proportional fonts. Proportional fonts will alter the display. Changing to a non-proportional font such as "courier" will rectify this. If an extensive set of comments is provided, the output files can become too large for the Windows Notepad and an alternative editor is recommended.
Editing Data Values (Step 3)

After opening and documenting a scenario, a spreadsheet appears with the data values corresponding to the fishing site characteristics (variables). Users create the scenarios by editing the data values in the spreadsheet.

Product lines are selected by clicking on a button in the "display" area at the top of the interface. The proposed, baseline, and default data for the current product line are viewed by clicking a button in the "view" area of the interface. The data values are edited by clicking on a cell and pressing the [Enter] key. Some tips for editing data values and moving around in the spreadsheets are provided on page 15.

When a scenario is first created, all spreadsheets are initialized by the default data values. The default data are the values which were used to estimate the model. The default values can not be edited and are provided for the reference of users.

To create a scenario, edit the proposed data values to reflect the "after the policy" data values for the fishing site characteristics. Users can also edit the baseline data values if desired. When the scenario is run through the trip prediction routines for the recreational demand model, the baseline data values are compared to the proposed data values.
Check Data (Step 4)

The check data command must be used before the scenario can be run. The check data command compares all baseline and proposed data values to the default data values. Any values that differ from the default data values are displayed in the report. It is up to the user to verify that all changes are correct before running the scenario. The example report in the above figure shows that for the product line Great Lakes Warm, the variable "open" has been set to 0 (a closure) for the county of Alcona.

The interface will execute the text editor chosen by the user, and the reports will "pop" up in their own windows. Once opened, the report windows are not controlled by the interface and must be closed by the user. (The above report is displayed using windows notepad).

The check data report is an ASCII test file and carries the "DAT" file extension. When displayed in the editor, the file may be saved under another name without affecting the original "*.DAT" file.
Run the Scenario (Step 5)

Once the changes to the data values have been checked, the scenario can be run by clicking the run button. This will start the trip prediction and benefit estimation routines for the fishing demand model. These computer routines run under DOS, so a DOS window will appear on the screen. Do not use the computer while the scenario is being run. The approximate minutes remaining for the run is presented at the top of the DOS window. A run takes about one hour on a 200 MHz Pentium. The message "press any key to continue ..." appears at the bottom of the DOS window when the run is finished. When a key is pressed, the scenario run report appears on the screen.  

Report: The scenario run report is displayed using the editor selected by the user (step 2). The editor in the above figure is the windows notepad. The run report is an ASCII text file which has the common scenario file name and the "RPT" file extension. The header contains the full scenario file name, the date, the creator's name, and any comments from the information screen.

---

4 In Windows 3.1, the DOS window closes when a key is pressed. In Windows 95, when a key is pressed the scenario report pops up in the foreground, but the DOS window remains open in the background. Windows 95 users will need to manually close the DOS window.
Run the Scenario (Step 5, continued)

The scenario run report consists of a series of tables. For example, figures 5 and 6 provide the first and second pages of the scenario report for the Oakland County river scenario from chapter 5 of the Hoehn et al. project report. In figure 5, Table 1 shows the estimated annual dollar value of benefits associated with the scenario ($476,479). Table 1 also presents the total predicted baseline trips for single and multiple day trip lengths, followed by the overall predicted changes in each of these categories. Subsequent tables present breakdowns of the predicted trips by product lines, counties, and trip length. To see the other tables, scroll down through the report.

Figure 6 shows the second page of a scenario report. The second table displays the summary of predicted baseline and changes in fishing trips broken out at the product line level. The figure also shows the first several rows of the third table, baseline trips by county and product line. Tables 3 and 5 actually consist of two parts, a table for single day trips and a table for multiple day trips. Unless the baseline site characteristics have been changed from their default values, the baseline trips will not differ from those presented in the project report. The baseline trip tables are presented because these will change whenever users alter baseline site characteristics as part of a policy scenario.
Other Interface Features

**County Locator Map**: The county locator feature (see figure 7) makes it easy to recall where a particular county is located in Michigan. Simply click the map button, and the locator screen pops up. Scroll through the list of counties and double click on the name of the desired county. The blue dot will then identify the county location.

**Go to Variable Button**: The "Go to" command button presents a pop-up list of the variables (and their long description) for the currently selected product line. This is an easy way of finding a particular variable: simply double-click on the desired variable and you are returned to the spreadsheet with the selected variable highlighted.

**Current Variable Description**: This feature provides a longer description of the current variable (column) than the short name that appears in the column of the spreadsheet. The long description appears to the right of the "View" section at the top of the interface screen. See figure 3.

**Help Menu**: The program contains a windows on-line help file. The help file contains much of the information that is presented in this user guide.

**Command Buttons**: A summary of the command buttons is provided on page 14.
Other Interface Features (Continued)

Comparing Data Values Across Views and Product Lines: The position of the current cell is maintained as one switches between the baseline, proposed and default views of the current product line. Because all counties and variables (rows and columns) cannot be displayed on the screen at one time, the current cell is maintained to facilitate comparison of data values. For example, to view the data for Wayne County, a user must scroll down the spreadsheet. To then compare the baseline, proposed, and default data values for Wayne County, one need only click back and forth between these three views. That is, the current cell does not need to be re-positioned.

The current view is also maintained when switching to different product lines. For example, if the baseline data is being viewed for the current product line, then switching to another product line will display the baseline data for that product line.
## Summary of Command Buttons

The following command buttons are found in the button bar along the top of the interface screen (see figure 3). Clicking on a command button with the mouse pointer will execute the command.

<table>
<thead>
<tr>
<th>Button</th>
<th>Command description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>About</strong></td>
<td>This command button displays the title and current version of the interface.</td>
</tr>
<tr>
<td><strong>New</strong></td>
<td>Use this command button to create a new scenario.</td>
</tr>
<tr>
<td><strong>Open</strong></td>
<td>Use this button to open an existing scenario for viewing or editing.</td>
</tr>
<tr>
<td><strong>Info</strong></td>
<td>This command button displays the information for the current scenario including the author, date created, and comments about the scenario.</td>
</tr>
<tr>
<td><strong>Save</strong></td>
<td>Use this button to save the current scenario using the current file name. Use &quot;Save As&quot; if you want to save the current scenario with a different file name.</td>
</tr>
<tr>
<td><strong>Save As</strong></td>
<td>The &quot;Save As&quot; command button is used to save the current scenario using a different file name. Copies of all associated data files are made when a new scenario is created using the &quot;Save As&quot; command.</td>
</tr>
<tr>
<td><strong>Print</strong></td>
<td>Prints the currently loaded spreadsheet (the one that is visible on the screen).</td>
</tr>
<tr>
<td><strong>Go to</strong></td>
<td>The &quot;Go to&quot; command button presents a list of the variables (and their description) for the currently selected product line. This is an easy way of finding a particular variable. Double-click on the desired variable and you are returned to the spreadsheet with the selected variable highlighted.</td>
</tr>
<tr>
<td><strong>Check data</strong></td>
<td>Checks data values for the current scenario and reports any data values that differ from the default values.</td>
</tr>
<tr>
<td><strong>Run</strong></td>
<td>This command button runs the trip prediction model for the current scenario.</td>
</tr>
<tr>
<td><strong>Reports</strong></td>
<td>The &quot;Reports...&quot; command button displays the model report for the current scenario, allowing you to view the output reports for the current scenario.</td>
</tr>
<tr>
<td><strong>Map</strong></td>
<td>Shows a map of Michigan counties. Users can select a county name and view it's location on the map.</td>
</tr>
<tr>
<td><strong>Help</strong></td>
<td>Use the &quot;Help...&quot; button to access on-line help for the current application.</td>
</tr>
<tr>
<td><strong>Exit</strong></td>
<td>Use the &quot;Exit&quot; command button to exit the current application.</td>
</tr>
</tbody>
</table>
Tips for Editing Data and Moving Around in the Spreadsheets

Useful keystroke combinations and result:

- **[Ctrl]-[Home]**: Go to the beginning of the worksheet (first column, first row).
- **[Ctrl]-[End]**: Go to the end of the worksheet (last column, last row).
- **[Home]**: Go to the first column of the current row.
- **[End]**: Go to the last column of the current row.
- **[Page Down]**: Move down one page in the current worksheet.
- **[Page Up]**: Move up one page in the current worksheet.

To edit a cell, use the arrow keys or mouse to go to the cell. When the border of the desired cell is highlighted by the black box, press **[Enter]** or double-click the mouse to highlight the current text. Note that county names, variable names, and default data cannot be edited. Another way to find a particular variable is to use the "**Go To...**" command button described above.

To copy text from a spreadsheet: Hold down the shift key and mark the desired area using the arrow keys, or use the mouse to mark the area. Once the area is marked, press **[Ctrl-Insert]** to copy the selected area. You can then go to another Windows application and press **[Shift]-[Insert]** to paste the text into that application. You can also paste text (data values) from other applications to an interface spreadsheet in a similar manner.

The spreadsheets used by the Policy Interface provide a means of displaying data in a familiar format. Unlike full-featured spreadsheets like one might find in software programs such as Excel, Quattro Pro, or Lotus 123, the Policy Interface spreadsheets do not allow one to manipulate the data values using formulas. However, since the interface supports copy and paste operations, any other Windows software can be used to manipulate the data. For example, suppose that you wanted to increase lake trout catch rates by 25% for all months at all counties. You could copy these data values to another program such as Excel, Quattro Pro, or Lotus 123. Then, you could multiply all values by 1.25. The resulting values could then be copied and pasted into the appropriate location in the **proposed** view of the Great Lake cold product line.

When editing data in a the current cell, pressing **[Enter]** will highlight the text in the current cell, and the data can be directly edited. Alternatively, clicking on a cell and typing (without pressing **[Enter]**) will position the cursor at the end of the data string. For example, suppose a cell contains the value "1." Clicking on the cell, pressing **[Enter]**, and typing "2" will result in a data value of "2." However, clicking on the cell and typing "2" will result in a data value of "12." That is, without the **[Enter]**, the digit "2" is added to the existing data string. Users should bear this in mind when editing data. This function is a peculiarity of the utility used in the programming.

Also note that in the cells of the spreadsheets, data values less than one are initially displayed without a leading 0. That is, one-half is displayed as .5 rather than 0.5. Users should be aware of this when editing and viewing data.
Technical Requirements

The program is designed to run on an IBM compatible personal computer running Windows 3.1 or higher. A Pentium class machine with a minimum of 16MB is recommended. About 75MB of free hard disk space is required for the program and data files. Most, but not all, Pentiums will have 128K cache, or more, on the mother board (e.g., "pipeline burst" cache). The scenarios will run much slower on machines without any on-board cache.

Note that each policy scenario that gets created requires about 1 MB of hard drive space. Thus, some file management will be required to keep the proliferation of files down. All files associated with a scenario are easily identified since they all use the name of the scenario as the filename (only the file extensions differ). The files will be stored in the following subdirectory \DA01\SCENARIO (unless otherwise named by users). Old scenarios can be deleted using the file manager in Windows 3.1 or the file explorer in Windows 95.

The program consists of two main components: the interface and the demand model program. The interface facilitates the editing of data and running of the demand model program. The demand model program runs the Michigan recreational fishing demand model and performs all the underlying calculations. The demand model program is DOS based. It is very computationally intensive and can take several hours to run on a Pentium class machine. The interface will run the demand model program so the user does not need to operate separate programs.

If the machine has sufficient resources (RAM), word processors and spreadsheets can be run at the same time as the interface when the interface is being used to create and edit scenarios. However, it is recommended that any other windows programs be closed before running the model (before clicking the run button). These other programs may use vital RAM resources and considerably slow the program. On RAM constrained machines, failure to close other programs before clicking run may cause the program to crash.

Scenarios can be created at a different time than they are run. In particular, the interface can be used to create scenarios which are then run on a different computer. To do so, create the scenario, check the data values, and save the scenario. Next, copy the scenario files to a diskette and transfer them to the "\DA01\SCENARIO" directory of the desired machine. To run the scenario on the new machine, open up that scenario, check data values, and click the run button.