Exploring ESI

A Guided Tour of the ESI Viewer

Hazardous Materials Response Division

Office of Response and Restoration

National Ocean Service

National Oceanic and Atmospheric Administration

Seattle, WA

April 2000

Welcome to the Environmental Sensitivity Index (ESI) Viewer! This guided tour tutorial will demonstrate the use of the ESI Viewer, which consists of a stand-alone FileMaker™ **Information Browser** and a specialized version of the mapping engine, **MARPLOT®**. The tour will accompany you through several different uses of ESI. We suggest that you follow each lesson in sequence, in its entirety, to best grasp the capabilities of the viewer.

This tutorial assumes that you have some knowledge of ESI maps. If you have limited knowledge of ESI, use your Internet browser to navigate to the ESI section of the NOAA Office of Response and Restoration (OR&R) web site: **http://response.restoration.noaa.gov/esi/esiintro.html** . There you'll find a description of the basic elements of ESI maps, sample ESI maps with the information that accompanies them, instructions and materials for an ESI exercise, and availability information for ESI atlases.

In this guided tour, we'll be using the ESI Viewer for San Francisco Bay, California; however, the lessons explained in this tutorial can be followed using a viewer for any other atlas. Simply substitute your atlas name for "San Francisco" and your atlas number for San Francisco's number, "030."

System Requirements

To make full use of the ESI Information Browser with MARPLOT, you will need:

- A PC system with a Pentium™ class processor running Microsoft® Windows® 95, Windows® 98, or Windows NT®; or
- A PowerPC® based Macintosh® computer with MacOS version 7.1.2 or later with 8 MB of unused RAM.

For all systems, you will also need:

- 20-50 MB of free space on your hard drive (space requirements vary, depending on the size of the atlas).
- CD-ROM drive.
- Color monitor.
- Color printer, if you want to print this guided tour or ESI maps.

Your Mission

You are a member of the Area Planning Committee for San Francisco Bay, California. As part of your preparations, you need to be able to quickly ascertain:

- the physical characteristics of the area's shoreline.
- the biological resources that exist there.
- the human-use resources that the area provides.

In this tour, you will use the ESI Viewer to quickly find this information, do searches to find specific features or resources on the map, and save map views to use later.

Getting Started

The objective of this lesson is for you to set up and become familiar with the basic components of the ESI Viewer:

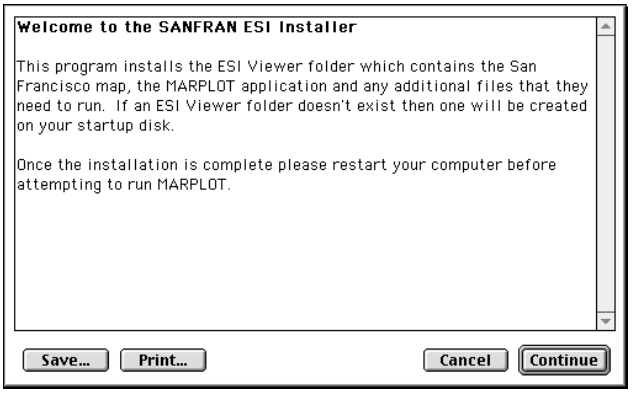
- Learn how to install the ESI Viewer (the Information Browser and the MARPLOT engine).
- Learn how to start the browser.
- Become comfortable using both the browser and the MARPLOT engine.

Follow these steps to install the ESI Viewer on your Macintosh:

1. Double-click the ESI Installer icon, , for your atlas.

You'll see a dialog box similar to this:

2. Click **Continue** to continue the installation, then read the information in the next dialog box.



3. Click **Continue**.

4. Click **Install** to install the folders, **San Francisco** and **MARPLOT**, into the **ESI Viewer** folder. The ESI Viewer folder will be created, if necessary, on your startup disk.

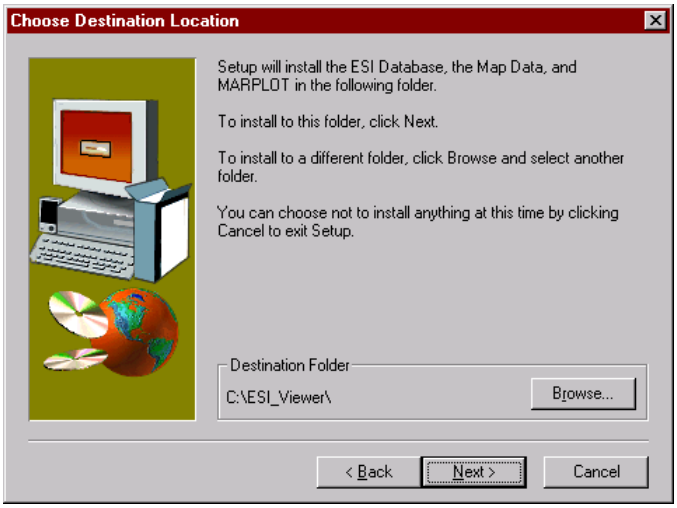
5. Restart your computer.

Follow these steps to install the ESI Viewer in Windows 95, 98, or NT:

1. Double-click the Setup icon, , for your atlas.

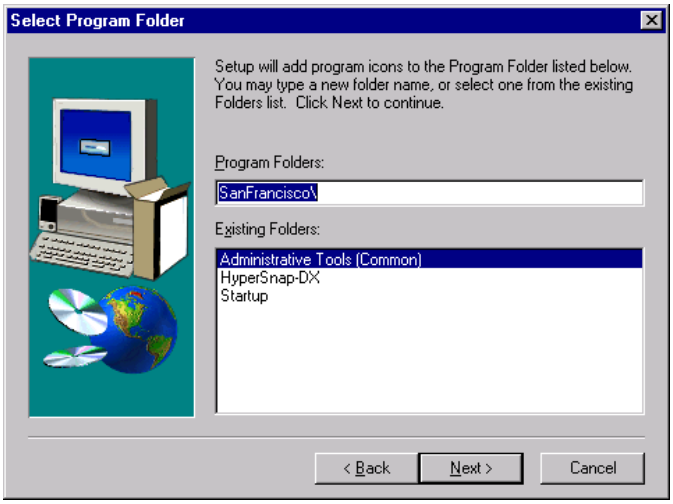
   You'll see a dialog box similar to this:

2. Click **Next** to continue the installation.



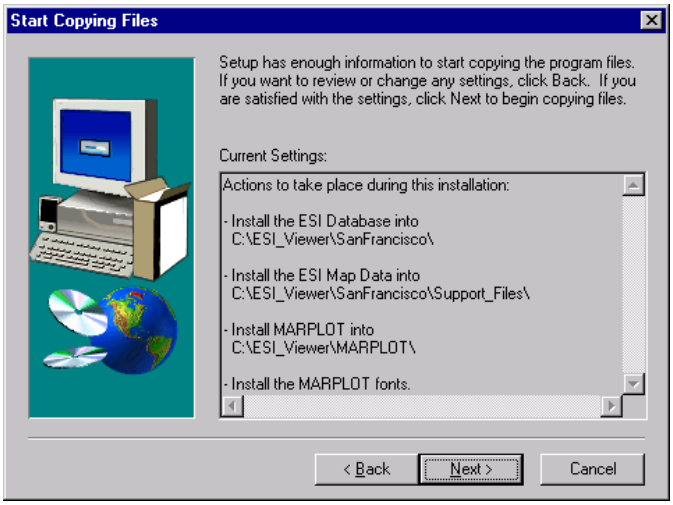
Setup will install the ESI Database, Map Data, and MARPLOT in the Destination Folder shown in the bottom part of this dialog box. You can select a different destination drive or directory by clicking **Browse**, but we strongly recommend that you keep the name **ESI_Viewer** as the lowest directory.

3. Click **Next** to install to the indicated folder.



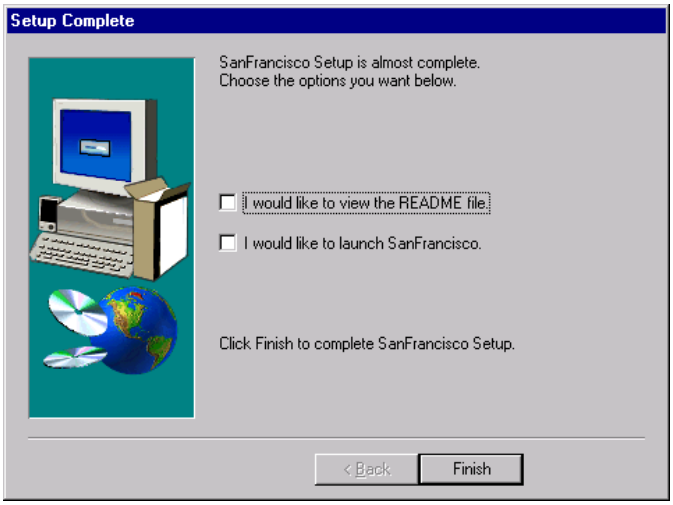
Setup will add program icons to the Program Folder shown on this window. You can type a new folder name or select a different folder from the list of existing folders.

4. Click **Next**.



On this window, you can review the settings that you chose for the installation. If you want to change any of the settings, click **Back**.

5. When you are satisfied with the settings, click **Next** to begin copying files.



If you would like to view the README file or launch the ESI Viewer after setup is done, click the appropriate box.

6. Click **Finish** to complete your setup.

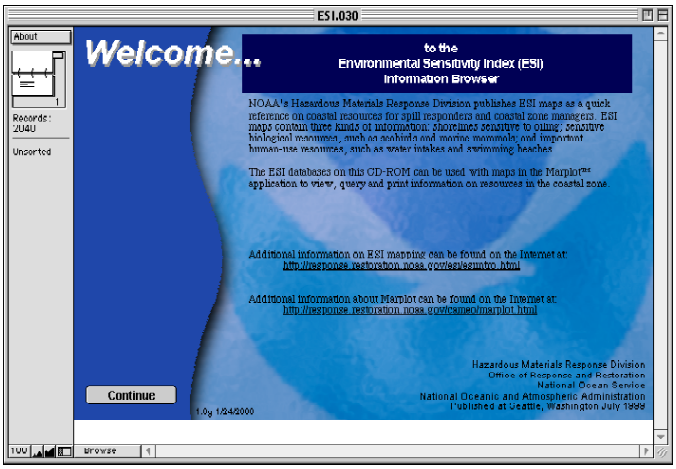
Starting the Information Browser

The Information Browser for each atlas is assigned a 3-digit number. The browser for San Francisco Bay, for example, is ESI-**030**. If you are looking at an atlas other than San

Francisco, substitute your atlas name and 3-digit atlas number wherever "San Francisco" and "ESI-030" appear in this tutorial.

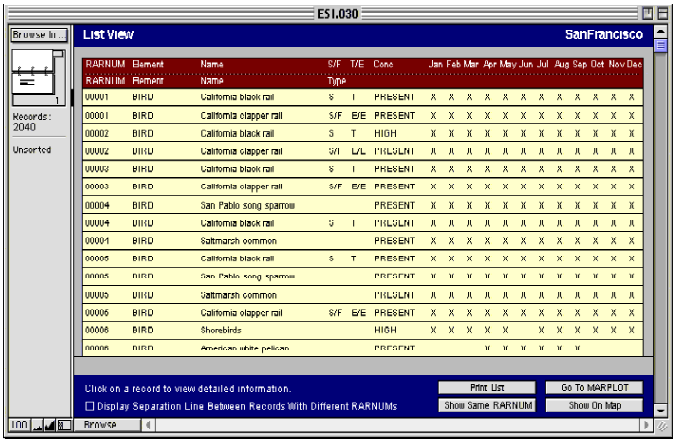
1. To start the San Francisco Bay Information Browser in **Windows 95, 98, or NT**, from the Start menu, choose the Programs submenu, the SanFrancisco submenu, then the SanFrancisco application. To start the San Francisco Bay browser on a **Macintosh computer**, open the ESI Viewer folder on your startup disk, then open the San Francisco folder. Double-click the ESI.030 icon, .

You'll see a Welcome dialog box like this:



2. Click **Continue** to open the browser.

The browser displays the records of the biological species that occur in your atlas area. The list begins with the records for the bird species that make up the biological layer, BIRD.



The **biology resources** displayed in most atlases include birds, fish, invertebrates, marine mammals, terrestrial mammals, reptiles, nests, and habitats.

Human-use (or socio-economic) features and shoreline types are also represented in the browser. You will learn more about these features shortly.

Getting Comfortable with the Information Browser and MARPLOT

Each Information Browser contains the ESI maps for the shoreline of a specific part of the country. ESI data characterize estuarine environments and wildlife by their **sensitivity to spilled oil**. ESI data include three general types of information:

1. **Shoreline Classification -** Shorelines are ranked quantitatively, reflecting their sensitivity, the natural persistence of oil, and the ease of cleanup.

2. **Biological Resources -** Biological resources include (1) oil-sensitive animals, (2) oil-sensitive habitats, and (3) rare plants, which are used by oil-sensitive species or are themselves sensitive to oil spills. These include submersed aquatic vegetation and coral reefs.

3. **Human-Use Resources -** Human-use areas are those that have added sensitivity and value because of their use (such as beaches, parks, and marine sanctuaries), water intakes, and archaeological sites.

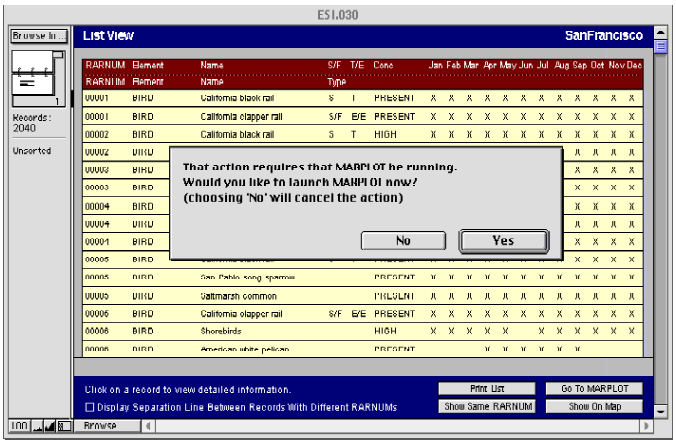
The shoreline types, biological resources, and human-use resources are represented in **layers** on the MARPLOT map:

Base Map Layers	Biology Layers	Human-Use Layers
HYDRO	BIRD	MGT
INDEX	NESTS	SOCECON
ESI	FISH	
	T_MAMMAL	
	M_MAMMAL	
	REPTILES	
	INVERT	
	HABITATS	

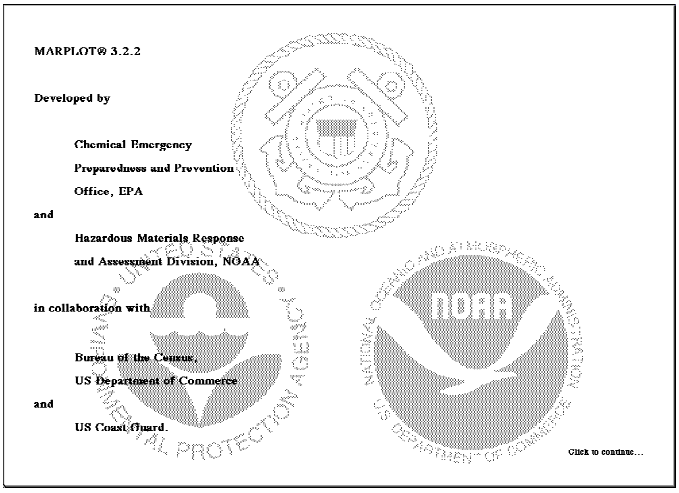
As you work through this guided tour, you will learn more about these layers.

The ESI Viewer couples the map objects found in MARPLOT with their associated attributes. The attributes are stored in the Information Browser (the San Francisco program). This stand-alone application lets you view and query ESI data, based on the fields provided. You can choose to display your query results on the MARPLOT map. MARPLOT allows users who don't have an established mapping program in place to view ESI data and do simple queries and analyses. You can select map objects in MARPLOT and view their associated attributes in the Information Browser. We will practice some of these queries later in the tour.

1. You are currently in the browser. Click **Go to MARPLOT** to open the MARPLOT program. In the dialog box that opens, click **Yes** to launch MARPLOT:

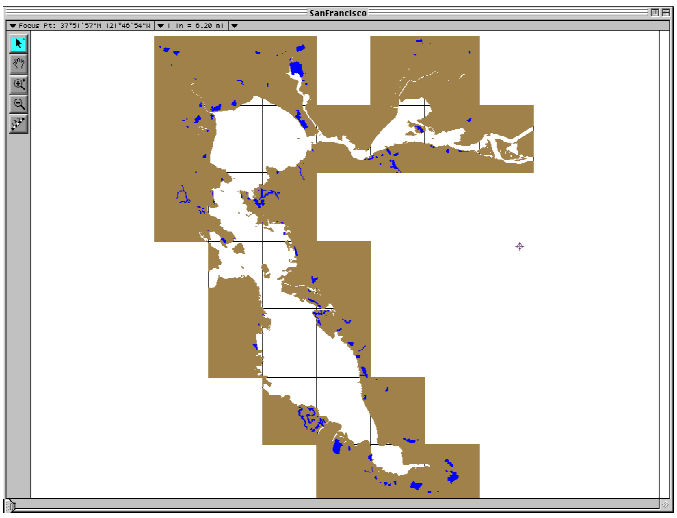


MARPLOT starts and displays this dialog box:

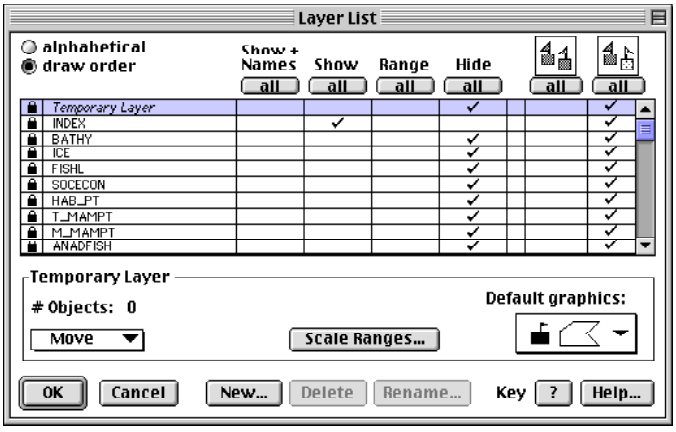


2. On a Macintosh, click anywhere in the dialog box to continue. If you are working in Windows, click **OK**.

The MARPLOT map opens with two visible layers: **INDEX** and **HYDRO**.



If the map on your screen looks more cluttered than the one shown above, you may need to turn off some layers. To do this, choose **Layer List…** from the **List** menu. In the **Layer List** dialog box (shown below), you select the layers you want to view in MARPLOT.



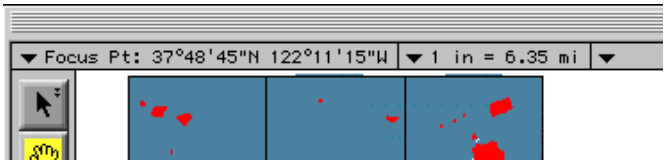
In this list, you may see some layer names that have no objects on the atlas you are viewing. For example, in the San Francisco Bay atlas, the layers BATHY, ICE, HAB_PT, T_MAMPT, M_MAMPT, ANADFISH, WETLANDS, and HYDROL are not present. The names appear in the Layer List dialog box because these layers may be present in other atlases you might view.

The layers shown above are listed in **draw order**, the order in which they appear on the map. The layer at the top of the list is the top-most layer on the map. (Later, you will see the importance of the draw order. When you click in an area that has objects on more than one layer, the object from the highest layer will be the one selected.)

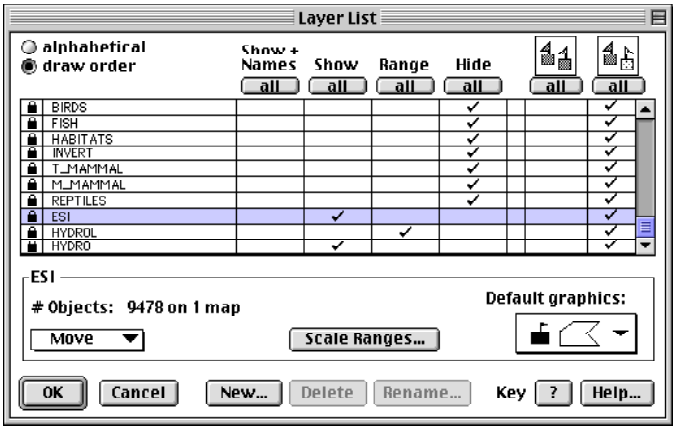
Make sure that only the Index and Hydro layers are "turned on" (that is, their **Show** check boxes are selected). To do this, scroll through the list of layers. Select the **Show** check box for each of these layers. All others layers should have the **Range** or **Hide** box selected. Click **OK** to close the Layer List dialog box.

The **HYDRO** data layer contains the hydrography features of the map. Streams and creeks are represented as linear features; larger areas, such as land masses and lakes, are represented as polygonal features. The **INDEX** data layer contains the map boundary polygons for each map (usually USGS 1:24,000-quadrangles) in the atlas. The HYDRO and INDEX layers are not linked to the Information Browser because they do not have any attributes associated with them.

A small, flashing, target-shaped icon called the "Focus Point," , marks the location of the most recent point of interest on the map. Click the arrow tool, , then click anywhere on the map to change the location of the Focus Point. The **latitude/longitude coordinates of the focus point** are shown in the upper-left corner of the map window. The **map scale** is also shown, to the right of the latitude/longitude coordinates.



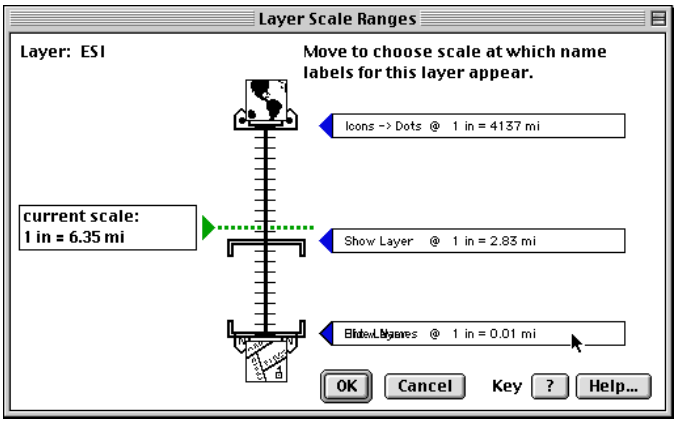
3. Press the shortcut keys, **Ctrl+L** (in Windows) or ⌘L (on a Macintosh), to re-open the **Layer List** dialog box, or choose **Layer List…** from the **List** menu. Select the **Show** check box for the **ESI** layer.



The ESI layer will now be "turned on" and will be drawn on the map, regardless of the zoom level. The other MARPLOT layers that have been set to **Range** will be hidden until you zoom in to the specified map scale.

You can experiment with the **Range** option by clicking a layer in the Layer List, then clicking **Scale Ranges…**.

You'll see the **Layer Scale Ranges** dialog box.



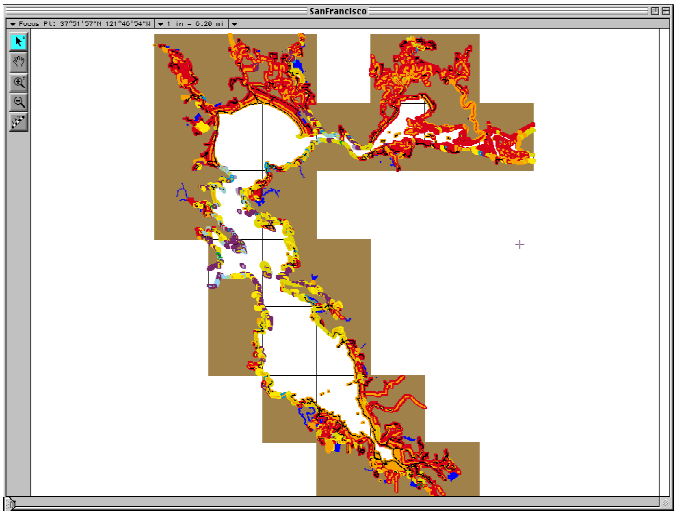
Drag the red-tipped arrow at the bottom of the scale. You'll notice that the option to "show names" (the **Show Names** arrow) is at the bottom of the scale bar for this layer. This is because the map objects in the ESI layer do not have unique names, so it isn't useful to show names for this layer.

To learn more about the **Range** option, click **Help…**.

Click **OK** to close the Layer Scale Ranges dialog box.

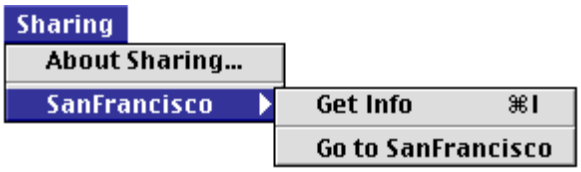
4. In order to view the ESI layer more clearly in the next section, turn off (that is, select the **Hide** check box for) the layers other than ESI, Index, and Hydro.

Your map should now look something like this.



Just as you were able to switch from the browser to MARPLOT, you can easily return to the browser.

5. From the MARPLOT **Sharing** menu, choose **SanFrancisco**, then choose **Go to SanFrancisco**, as shown here:



Practice switching back and forth from the browser to MARPLOT. When you feel comfortable, switch back to MARPLOT, so that you will be ready to find some shoreline types in the next section.

Shoreline Resources

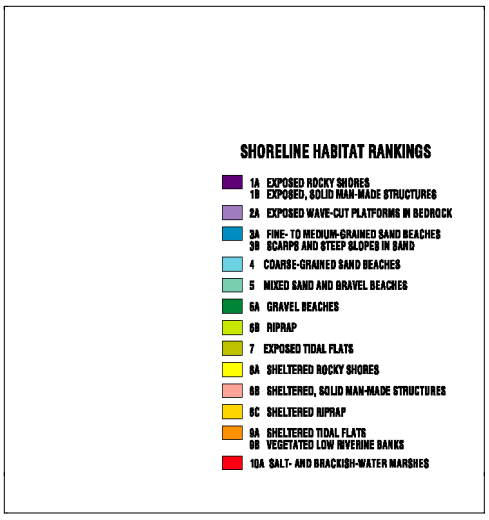
Shoreline habitats have a high likelihood of being directly impacted by an oil spill. The standard ESI shoreline rankings are based on an understanding of the physical and biological character of the shoreline environment—not just the substrate type and grain size. The sensitivity ranking is controlled by the following factors:

- Relative exposure to wave and tidal energy
- Shoreline slope
- Substrate type (grain size, mobility, penetration, and trafficability)
- Biological productivity and sensitivity

In the **ESI** data layer of the Information Browser, shorelines are ranked on a scale from **1 (least sensitive)** to **10 (most sensitive)**.

Shorelines are also color-coded to indicate their sensitivity to oiling. Sheltered areas with associated high biological activity have the **highest ranking**. In the ESI layer of the map, **warm colors** like red and orange denote the shorelines that are most sensitive to oiling, such as tide flats and marshes. (Sheltered tidal flats are very sensitive because of the high density of organisms and low natural flushing rates. Marshes are considered to have great ecological value because they serve as a nursery ground to numerous species of invertebrates and fish, and because the plants in these areas serve as the basis of the food chain in estuarine systems.) In contrast, areas exposed to high levels of wave action, tidal currents, and low biological activity generally rank **low on the scale**. In the ESI layer, **cool colors** like blue and purple indicate the least sensitive shorelines, such as rocky headlands and sand and gravel beaches. **Shades of green** denote shorelines of **moderate sensitivity**, such as exposed tidal flats, areas of riprap, and gravel beaches.

MARPLOT maps are color coded to match the colors used in hard copy ESI maps. This chart shows the color coding of the ESI shoreline rankings found in the San Francisco Bay atlas.



Use MARPLOT to learn what shoreline type a particular shoreline section is. Let's begin by trying to find a section of **blue shoreline** somewhere on your map. To do this, you may need to adjust the position of the map, or zoom in to see more detail.

1. Click the hand tool, , then click and drag to move the map within the window.

At any time while the map is being drawn, you can stop the drawing by clicking anywhere on the map, or by pressing the **Esc** key on your keyboard.

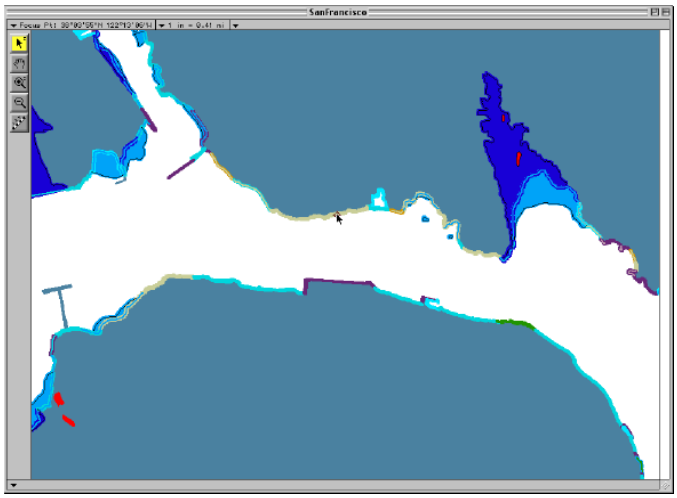
2. To zoom in on a section of the map, first click the zoom-in tool, , then click the map section you need to view more closely. You can also outline the area you want to zoom to by pressing down your mouse button, dragging diagonally across the section of map you want to view, then releasing your mouse button.

3. Next, click the arrow tool, . If you found a section of blue shoreline, click that section. Otherwise, click any shoreline section.

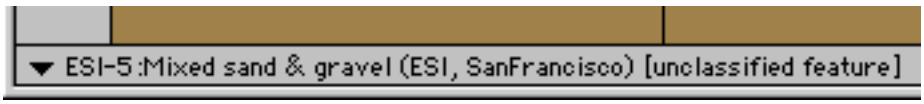
The **lower left corner of the map window** will show the following information:

- Shoreline ranking *(numeric, from 1-10)*
- Shoreline classification *(text description)*
- (Data Layer, Map)
- [unclassified feature]

In the map shown below, the classification for blue shoreline is shown like this:



blue shoreline:

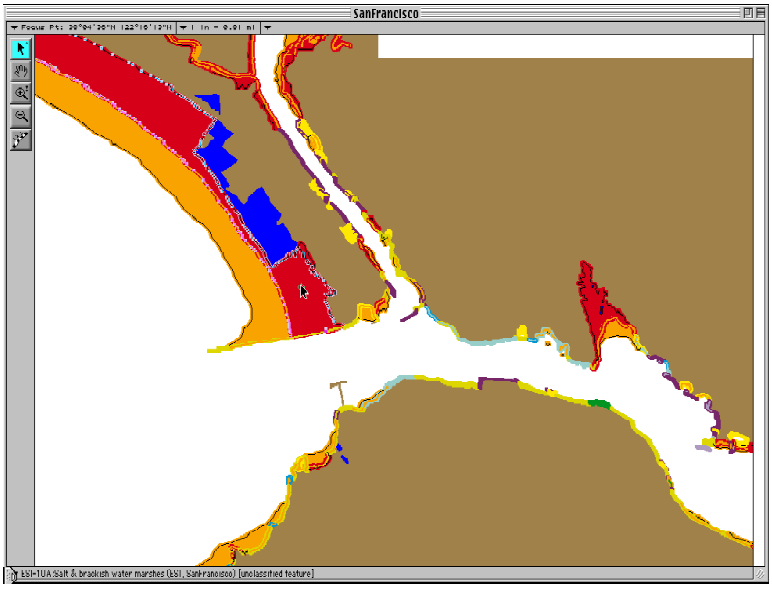


This tells you that (1) the shoreline is classified as ESI-5, which is a mixed sand and gravel beach, and (2) this information is part of the ESI data layer of the San Francisco Bay map. In other MARPLOT applications, feature types may be used on some layers. The ESI Viewer does not classify feature types, hence the last section, [unclassified feature].

If you were able to find a blue shoreline section, was the same information provided for the section you clicked? You'll notice in the San Francisco Bay legend shown above, ESI types 3A, 3B, 4, and 5 all use a shade of blue. You may have chosen one of these other shoreline types. Also, although standard ESI colors are used to symbolize the MARPLOT maps, colors will vary between different computer monitors. This may affect what you see on your computer.

4. Tidal flats and marshes are represented by colored polygons in the ESI layer. Use the hand tool to find a **red ESI polygon**, and note the ESI numeric and text description.

In the map shown below, the shoreline classification for the red polygon is shown like this:

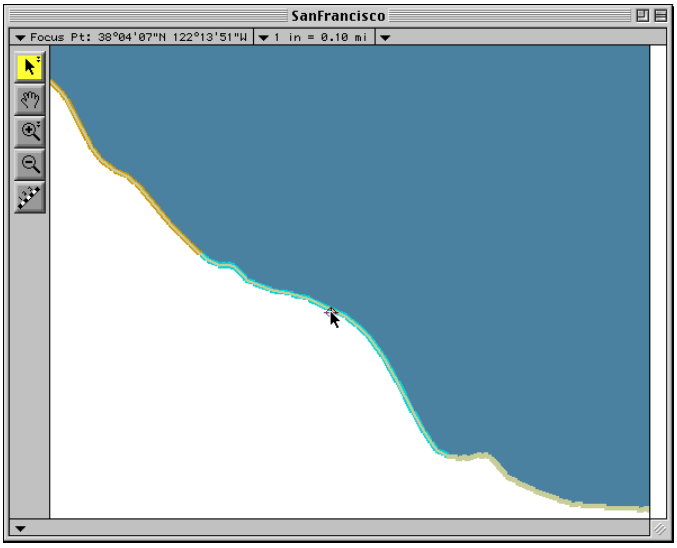


red polygon:

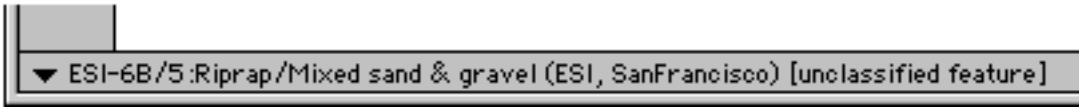
This tells you that (1) the shoreline is classified as ESI-10A, which is salt- and brackish-water marsh, and (2) this information is part of the ESI data layer of the San Francisco Bay map. (Again, there are no feature types for the ESI layer.)

5. The ESI layer can have up to three **combinations of sensitivity** to designate the landward, shore, and seaward sections of the shoreline. **Combination shorelines are shown with a dual- or tri-colored line.** Use the hand and zoom tools to find a combination shoreline on your map.

In the map shown below, a combination shoreline is shown by the **dual-colored, yellow and blue line**.



Clicking the arrow tool on this shoreline shows that this shoreline section is **Classification 6B, Riprap,** on the **landward** side of the shore, and **Classification 5, Mixed sand and gravel beach**, on the **seaward** side.



In the next section, you will find sensitive biological resources that exist in your atlas.

Biological Resources

The biological resources denoted in the ESI Information Browser include **oil-sensitive animals** and **habitats that either (a) are used by oil-sensitive animals or (b) are themselves sensitive to spilled oil** (coral reefs are an example of a sensitive habitat).

Some species of animals and plants are especially vulnerable to the effects of oil spills. Under the ESI method, these species have been classified into **seven categories, or elements**. Each category has been further divided into **groups of species, or sub-elements,** that are similar in lifestyle and as such, would be similarly affected by spilled oil. For example, there are eight sub-elements for birds, with raptors including those species of eagles, hawks, falcons, kites, osprey, etc., which nest or migrate close to major water bodies and feed on fish or aquatic birds.

Each atlas usually contains these **elements**, which are distinguished on the map by unique color and hatch patterns:

- BIRD
- FISH
- HABITATS (habitats and plants)
- INVERT (invertebrates, including shellfish, crustaceans, and sometimes, endangered insects)
- M_MAMMAL (marine mammals)
- NESTS (specific bird nesting sites)
- REPTILES (reptiles and amphibians)
- T_MAMMAL (terrestrial mammals)

The following biological information is provided for these elements:

- the species present and their areal extent.
- the scientific name for each species.
- the species concentrations by location.
- the monthly presence of each species.
- the breeding activity occurring or life stage(s) present at each location, by month.
- the species threatened and endangered status (State and Federal).
- source information in reference to data collection.

Occasionally, special unique data layers may be included to reflect conditions unique to an area, or of special interest to the local community. These layers include

- ANADFISH (beginning points of anadromous fish runs)
- BATHY (bathymetric contour lines)
- FISHL (line data for anadromous fish species)
- HAB_PT (habitats and rare plants represented as points)

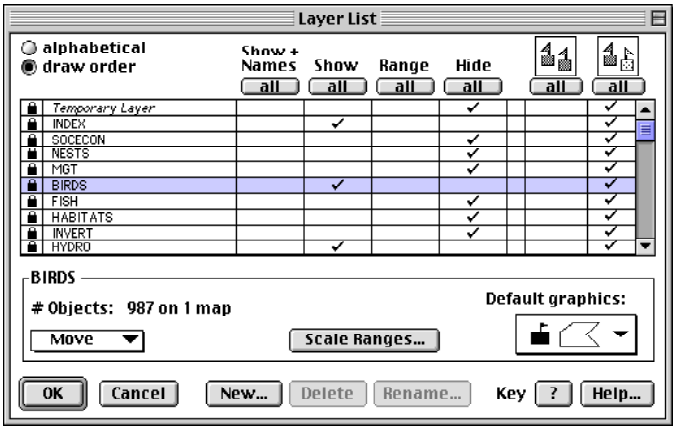
- HYDROL (line data depicting base map information too narrow to be shown as a polygon. Features may include rivers, piers, and breakwaters.)
- ICE (lines showing average extent of pack ice by month)
- M_MAMPT [marine mammal locations represented by points (for example, seal haulout locations)]
- T_MAMPT (terrestrial mammal locations represented as points)
- WETLANDS (beginning points of intermittent coastal wetlands)

All data layers are documented in the atlas Metadata report.

Use MARPLOT and the browser to find some of the bird species that occur in an area of the map.

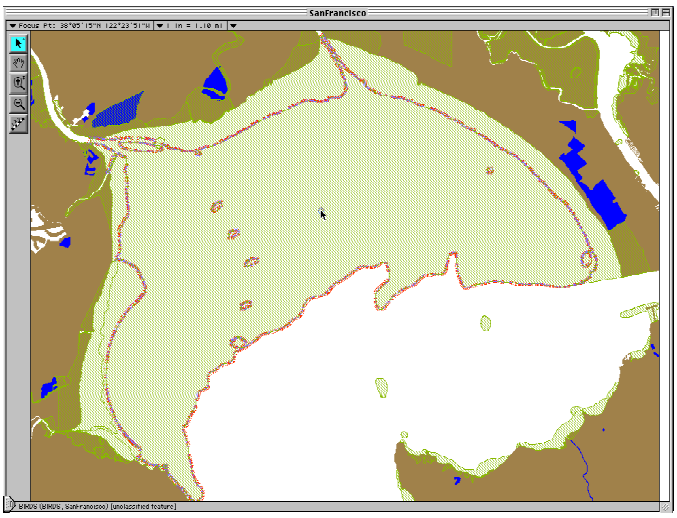
1. Press the shortcut keys, **Ctrl+L** (in Windows) or ⌘L (on a Macintosh), to open the **Layer List** dialog box. In the **Layer List** dialog box, turn off (**Hide**) the **ESI** layer of the map and turn on (**Show**) the **BIRD** layer.

When you have done this, the dialog box should look like this:



2. Using the arrow tool, , click once in a BIRD polygon, shaded like this .

The perimeter of the polygon changes to a multi-colored line, showing that the polygon is selected. Here is an example of a selected BIRD polygon:

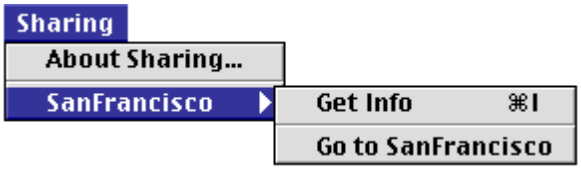


The points and polygons representing the biology on the MARPLOT map use the same colors as the traditional ESI maps. As in the traditional maps, large areas, such as tidal flats used by shellfish, and wetlands used by shorebirds or waterfowl, are shown as colored polygons. The polygons for each element use the following colors and hatch patterns:

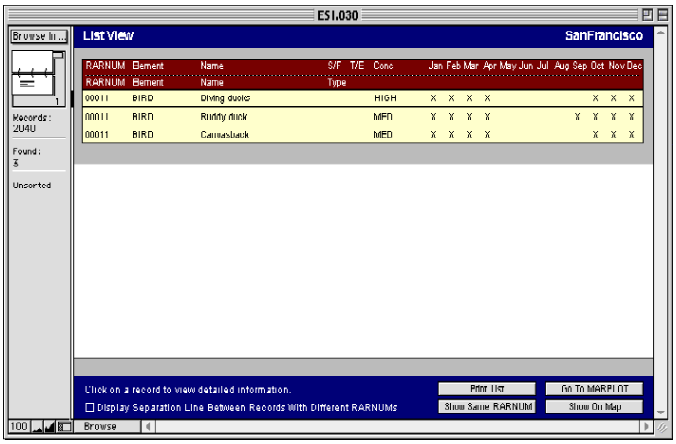
ELEMENT	COLOR	SYMBOL
BIRD	Green	
HABITATS	Violet	
FISH	Cyan	
INVERT	Light Orange	
M_MAMMALS	Light Brown	
REPTILES	Red	
T_MAMMALS	Light Brown	

As you look over the map, keep in mind that colors tend to appear differently on different computer monitors. Also, because the hatch patterns are transparent, the layers underneath will affect their appearance.

3. From the **Sharing** menu, choose **San Francisco**, then **Get Info**.



The browser lists the bird species that are present in the selected polygon. For the polygon selected above, three records are listed in the dialog box:



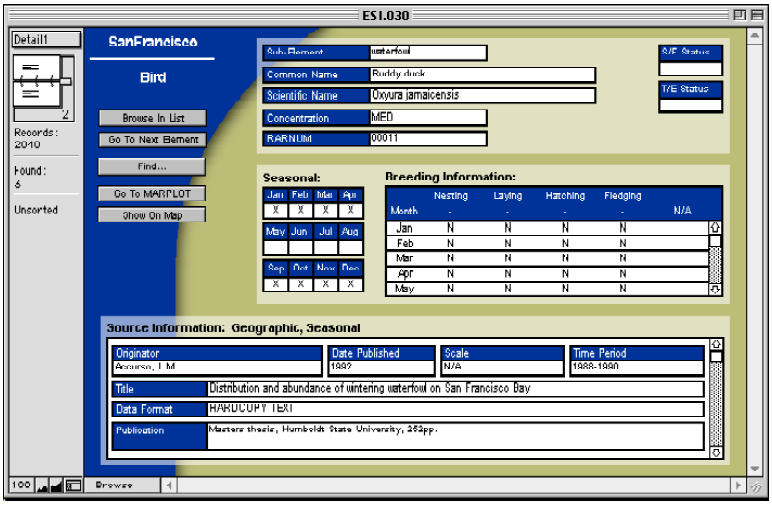
The bird species commonly known as Diving ducks, Ruddy ducks, and Canvasbacks are present in this polygon. Diving ducks are present in high concentration (see the **Conc** column) from October to April, Ruddy ducks are present in medium concentration from September through April, and Canvasbacks are present in medium concentration from October through April.

Concentration may be given as "high," medium," or "low," or as the number of individuals or nests within the polygon. (In some of the earlier atlases, concentration information wasn't collected. In those cases, or where concentration information isn't available, this field will be blank.)

None of the species listed in the dialog box are threatened or endangered (see the **T/E** column), according to either State or Federal listings (**S/F** column).

4. To get more specific information about any bird species, click the record.

For example, clicking on the **Ruddy duck** record in the results shown above leads us to the following information:



The Ruddy duck (scientific name *Oxyura Jamaicensis*) is part of the Sub-Element waterfowl. The **Breeding Information** table shows when each biological element's breeding activities occur. For BIRD, the table shows when the species is nesting, laying, hatching, and fledging. From the table, we can see that the Ruddy duck has no breeding activity (shown as "N") during the year in the area spanned by this polygon.

5. To find sources of information for a particular species, scroll through **Source Information** in the lower section of the dialog box.

Geographic sources provide location and concentration information on the species located in a polygon, line, or point feature. Seasonality sources provide seasonality information on the species. These sources may be the same.

6. Click **Browse in List** to return to the list of birds that are present in this area. Check the other bird species to learn about the times of year in which they are nesting, laying, hatching, or fledging.

7. Next, click **Go to MARPLOT** to return to the map.

You can get information about the species present in one layer or in several layers of the MARPLOT map.

1. Press the shortcut keys, **Ctrl+L** (in Windows) or ⌘L (on a Macintosh), to open the **Layer List** dialog box.

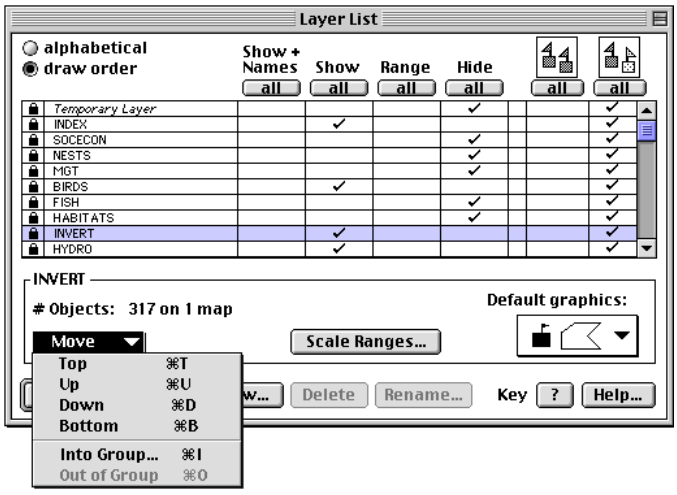
2. Scroll through the list of data layers (if necessary) to find the **INVERT** layer. Select the **Show** check box for INVERT to show both the BIRD and INVERT layers on the map at the same time.

Depending on the order of the data layers, you may need to move the INVERT layer higher on the list so that it displays over the BIRD layer. **To change the draw order:**

a. Click **draw order** in the upper left section of the dialog box (if it isn't already selected).

MARPLOT lists the layers in the order that they will be drawn on the map. (The **top layer on the list** will be drawn as the **top layer on the map**.)

b. Click the INVERT layer to select it.



c. Click the **Move** drop-down list (shown above), then click **Up** to move the INVERT layer up one layer in the list. Press the shortcut keys, **Ctrl+U** (in Windows) or ⌘U (on a Macintosh), to move the INVERT layer until it is above the BIRD layer in the list.

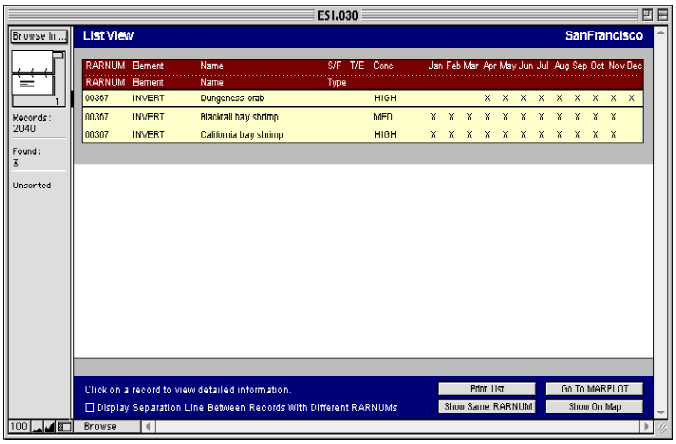
d. Click **OK**.

3. Using the arrow tool, click any area of the map that shows both the BIRD and INVERT layers.

The perimeter of the selected polygon changes to a multi-colored line.

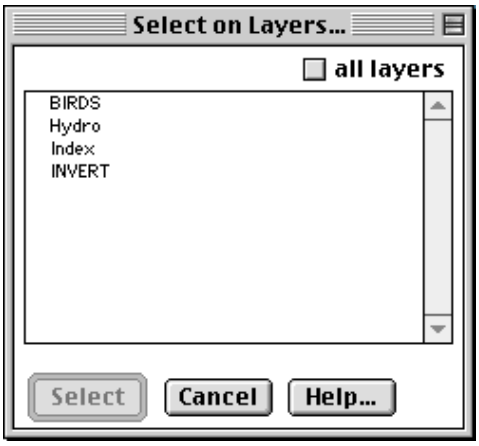
4. Press the shortcut keys, **Ctrl+I** (in Windows) or ⌘I (on a Macintosh), to learn more about the species that are present in this polygon.

When you click once in an area of the map, the browser provides information about the **highest visible layer** (in this case, the INVERT layer) **only**.



5. To learn what species are present in **several data layers**, press down your mouse button and drag diagonally to include a small section of the polygon.

The **Select on Layers …** dialog box opens, where you select the layers you want to include in your request.

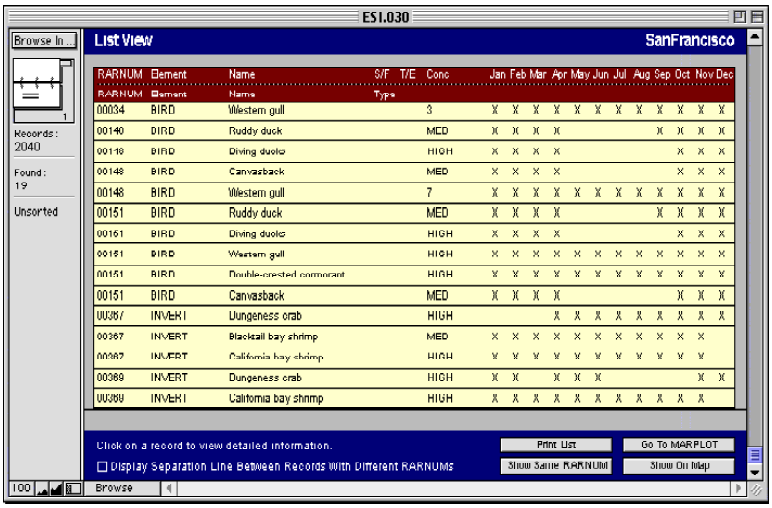


6. Click the layers BIRD and INVERT to include only these layers in your information request. (Only layers that are currently "turned on" or are set to **Range** mode will show in this dialog box.)

7. Click **Select**.

8. Press the shortcut keys, **Ctrl+I** (in Windows) or ⌘I (on a Macintosh), to learn what bird and invertebrate species are present in this area.

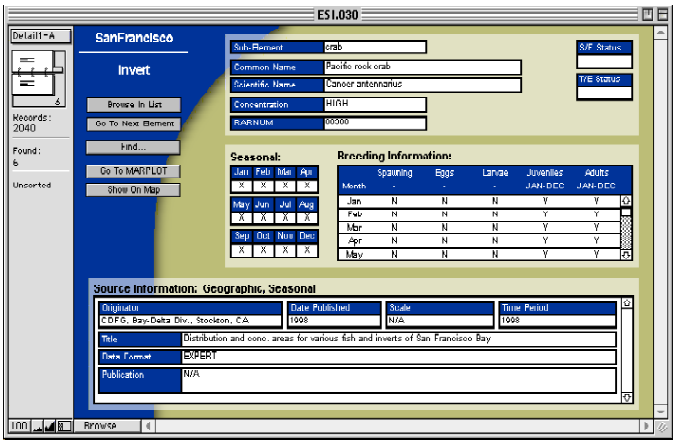
You'll see a dialog box something like this:



You may notice that some species (such as the California Bay Shrimp in the dialog box shown above) are listed more than once. This may happen for two reasons. The first, and most likely, explanation is that this species occurs in more than one of the selected polygons. A particular grouping of species with like concentrations and seasonality are represented by a single **"resource at risk" number**. This number is abbreviated as **RARNUM** and is the first column shown in the List View. You may choose to show a break between RARNUMs by selecting the check box, **Display Separation Line Between Records With Different RARNUMs,** at the bottom of the List View window. If this box is not currently selected, select it to see the different "resource at risk" groups. (Unchecking this box may increase performance.)

On occasion, you may also see multiple entries of the same species within the *same* RARNUM. This occurs if there were multiple source records for the same species in the original database.

9. Click any one record to learn more about that species and its activities. Here is the detailed view that is provided for the Pacific Rock Crab:



Once you are comfortable getting information about the species that inhabit various areas, you can try using the browser to perform some searches.

In order to do any searches involving breeding activities, you will need to know what breeding activities are represented in your atlas. (Not all breeding activities were collected in every atlas, so some breed categories may not be represented.) The categories Breed1, Breed2, Breed3, etc. represent breeding activities specific to each element. **Shown below are the breeding activities for each element in the San Francisco Bay atlas:**

Element	Breed1	Breed2	Breed3	Breed4	Breed5
BIRD	Nesting	Laying	Hatching	Fledging	N/A
FISH	Spawning	Eggs	Larvae	Juveniles	Adults
HABITATS	N/A	N/A	N/A	N/A	N/A
INVERT	Spawning	Eggs	Larvae	Juveniles	Adults
M_MAMMAL	Mating	Calving	Pupping	Molting	N/A
REPTILES	Nesting	Hatching	Internesting	Juveniles	Adults
T_MAMMAL	N/A	N/A	N/A	N/A	N/A

Breed1, Breed2, Breed3, etc. may represent different activities in your atlas. **To verify what Breed1 through Breed5 represent in your atlas, return to a detailed view (such as the one shown in step 9 above) in your browser.**

In the **Breeding Information** section of the **detailed view**, the breeding activities (Breed1, Breed2, Breed3, etc.) are shown as column headings. Shown below are the breeding activities for the **Invert** layer of the San Francisco Bay atlas, as well as the range of months when each activity is occurring.

Check the breeding activities for the elements in your atlas. To do this, click **Go To Next Element**. The next element in the San Francisco atlas is terrestrial mammals (**T_mammal**), where Breeding Information is not available. To complete this tutorial, you will need to know the breeding activities for the Bird element in your atlas, so continue to click **Go To Next Element** until you see the window for **Bird**.

These are the breeding activities for the **Bird** layer of the San Francisco Bay atlas. Your atlas may show different headings.

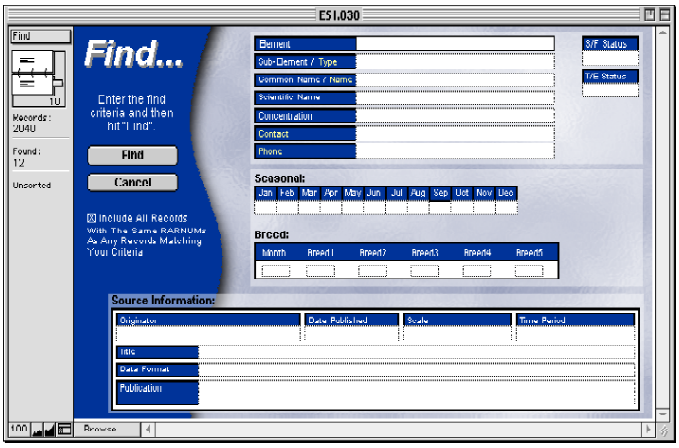
You may find it helpful to print the following table, then note the breeding activities that correspond with each element in your atlas.

Element	Breed1	Breed2	Breed3	Breed4	Breed5
BIRD					
FISH					
HABITATS					
INVERT					
M_MAMMAL					
REPTILES					
T_MAMMAL					

Find areas of the map where any birds are nesting in the month of March. Show those nesting areas on the map. You will first want to turn off (**HIDE**) the INVERT and BIRD layers on the MARPLOT map. MARPLOT automatically turns on layers that are affected by a FIND request.

1. Click **Find** in the detailed information dialog box (shown above).

You'll see the ***Find…*** dialog box.



In this dialog box, you will enter the criteria you wish to search. (If any of the boxes contain text when the dialog box opens, click the box to select the text, then press the DEL key on your keyboard.)

2. Click the **Element** box, then select "BIRD" from the choices in the drop-down menu.

The menu for **Sub-Element / Type** will display. Choose a sub-element only if you want to restrict your search to a certain type of bird. Otherwise, click anywhere outside the menu to close it.

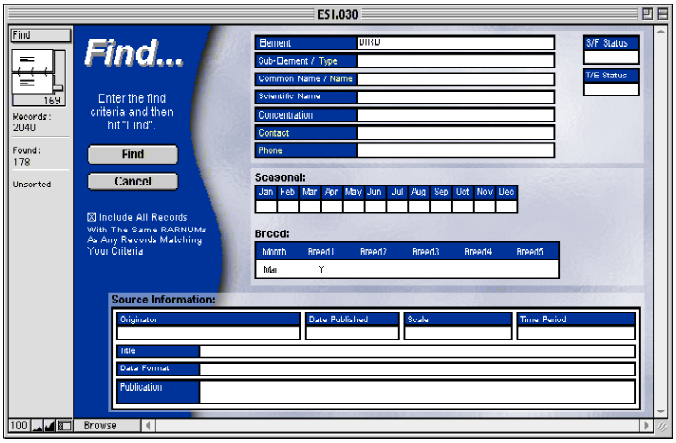
3. Under **Breed:**, click the **Month** text box, then select "Mar" from the **Month** menu.

   You will see the **Breed1** menu.

4. Choose "Y" (yes) in the **Breed1** menu to include nesting in your search criteria.

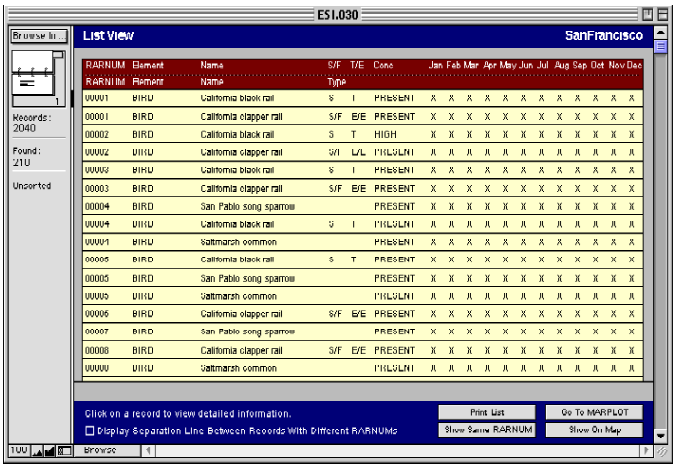
   The **Breed2** menu displays. You can click anywhere outside the menu to close it.

   Your ***Find…*** dialog box should now look like this.

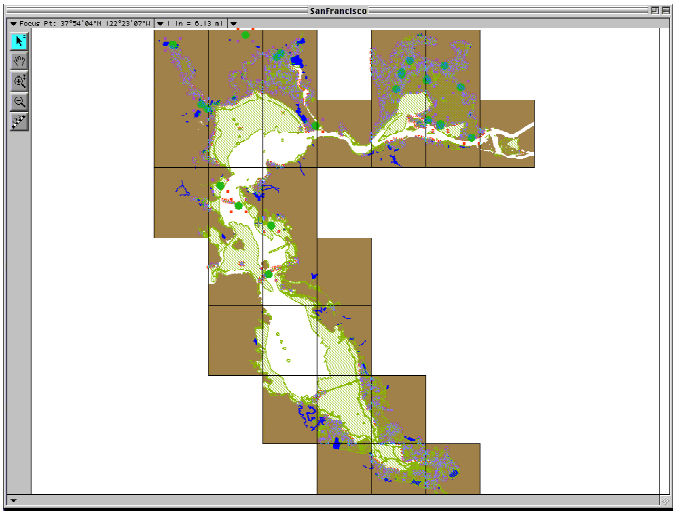


5. Click **Find**.

   The browser displays a list of all bird species that are nesting in the area covered by this atlas in the month of March. Some species may be present in more than one RARNUM.

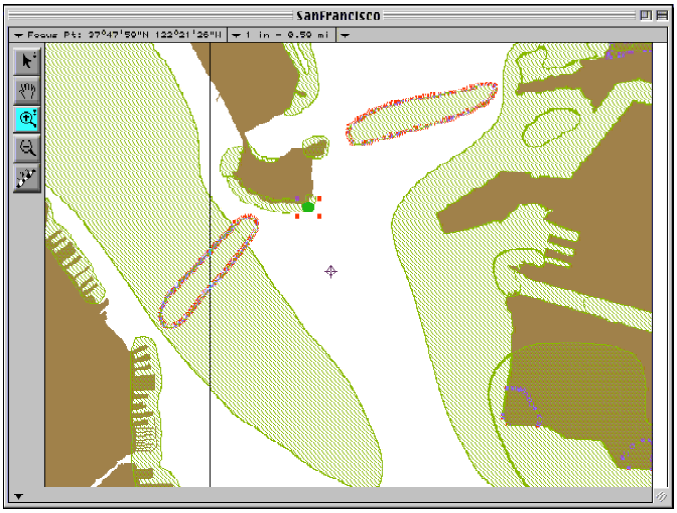


6. Click **Show On Map** to see where these species are nesting.

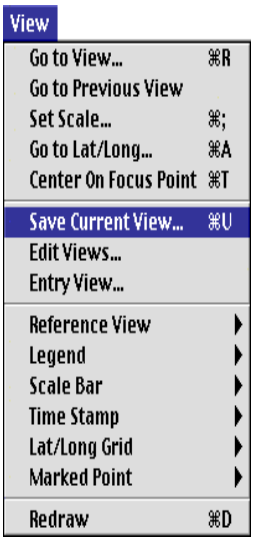


In the MARPLOT map that displays, **polygons** in which nesting are occurring are highlighted with a **multi-colored line**. In addition, some atlases have a data layer, **NESTS**, which contains point data showing specific **nest sites** on the map. Any site where nesting is occurring in March is shown as a **selected** green dot, .

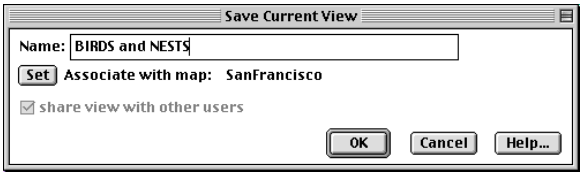
7. Use the zoom-in tool, , and the hand tool, , to get a closer view of any of the highlighted polygons or points. (To zoom back out, click the zoom-out tool, , then click on the map, which will be redrawn centered on the point where you clicked. To redraw a full view of the map, from the **List** menu, choose **Map List…**. Be sure that "San Francisco" is the selected map, then click **Go to Map**.)



8. At some point, you may wish to **save a view of your map** to use at a later date. Zoom in to an area of particular interest. To save your view, from the MARPLOT **View** menu, choose **Save Current View…**.



9. Enter a name for the view you wish to save, then click **OK**.

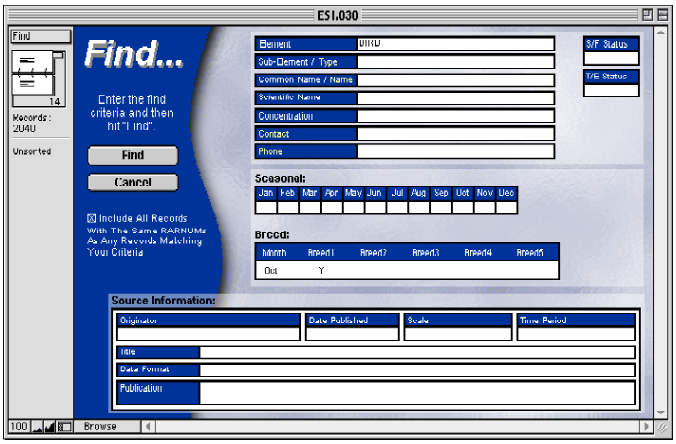


When you want to return to this view, from the **View** menu, choose **Go To View…**. Click the view name you wish to see, then click **Go to View**.

10. From the MARPLOT **Sharing** menu, choose **San Francisco**, then choose **Go to San Francisco** to return to the browser.

The Information Browser is also helpful in locating threatened or endangered species that may need protection in the event of an oil or chemical spill. **Try finding any State and/or Federally endangered species for your atlas.**

1. To return to the ***Find…*** dialog box, click any one of the species records, then click **Find…**.



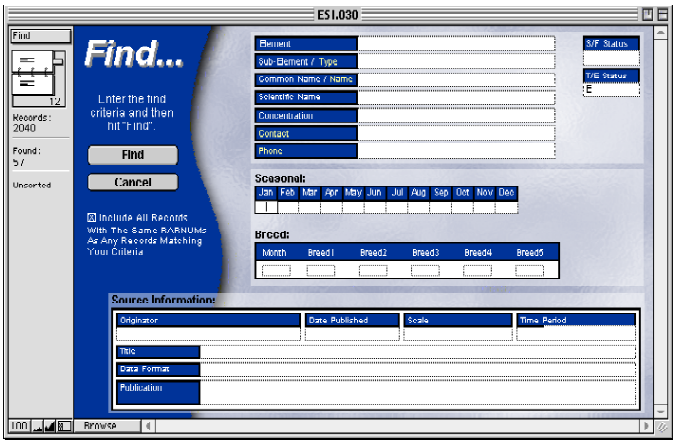
2. Click the **Element** box to select the "BIRD" entry, then press the **Del** key on your keyboard to clear the box. In the **Breed:** section, clear the "Mar" and "Y" entries in the same way.

3. In the upper right section of the dialog box, click the **T/E Status** box and select "E" to show endangered as the status category.

When you leave the **S/F Status** box empty, the browser searches for both State and Federally listed species.

4. Click outside of the **Seasonal:** section to close the menu that displays.

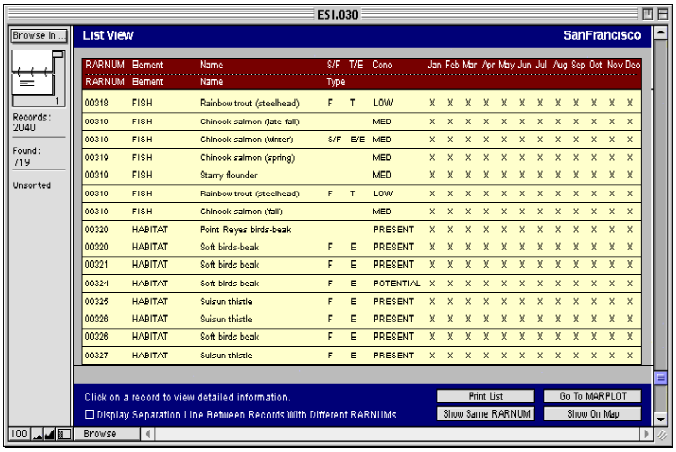
Your ***Find…*** dialog box should now look like this.



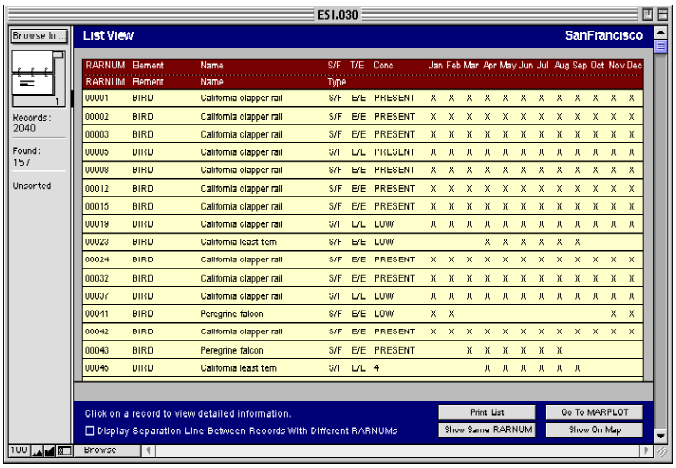
5. Click **Find**.

The browser displays the area's State and/or Federally endangered species, outlining their element category, common name, listed status jurisdiction, concentration, and seasonal presence.

In the **Find…** results shown below, the Chinook Salmon (winter) is shown as both **State and Federally endangered (S/F E/E)**, whereas the Soft Birds-Beak plant species is shown only as **Federally endangered (F E)**.



In these results, you'll notice that not all the species are shown as endangered. For example, there are two plant species with a RARNUM of 320, but only one of them is endangered. That's because these results list all the species present within polygons where **at least one species** in endangered. If you want to see a list of the **endangered species only**, in the ***Find…*** dialog box, uncheck the box labeled, "Include All Records With The Same RARNUMs As Any Records Matching Your Criteria". Your results should then show endangered species only, like this:



Finally, if an atlas spans more than one state, each state in which the species is threatened or endangered is listed on a separate line.

Human-Use Resources

Some human-use resources are especially vulnerable to damage from oil spills. They can be divided into four major components:

- High-use **recreational and shoreline access areas**, such as boat ramps, marinas, recreational beaches, and sport-fishing and diving areas.
- **Resource extraction sites**, such as aquaculture sites, locations of subsistence and commercial fisheries, log storage sites, mining leases, and surface water intakes.
- Water-associated **archaeological, historical, and cultural sites**, including lands managed by Native Americans. Cultural sites located in the intertidal zone, or close to the shoreline where they could be damaged by cleanup crews, are at particular risk.
- Officially designated **natural resource management or protected areas**, such as national parks, marine sanctuaries, national wildlife refuges, preserves, and reserves.

The first three of these components exist in small areas and are represented as **point symbols** in the socio-economic layer, **SOCECON**. The point symbols in this layer may not show the *exact* location of some archaeological and cultural resources, because of the risk of vandalism to these sites. In the case of these sensitive resources, random points are generated within close proximity to the actual resources. These are the points you will see on the MARPLOT map. Occasionally, you may also see some **line data** in the SOCECON layer. Line data may represent a structure, such as a bridge. These lines do not link to the Information Browser.

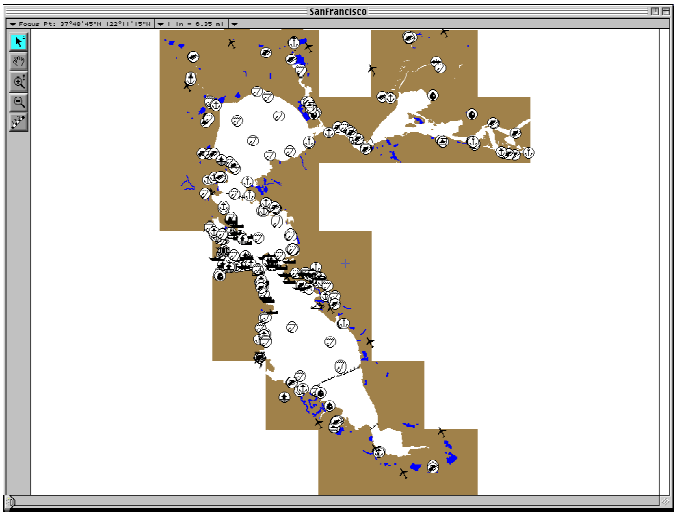
Larger areas, such as the managed or protected areas that make up the fourth human-use component, are better represented as **polygons**. A separate data layer, **MGT**, contains these managed areas as polygonal areas.

The following table shows the kinds of human-use resources included in the San Francisco Bay atlas and the **symbols** used to represent them in the hard copy atlas. Similar symbols are used for the point data in MARPLOT.

To find localized areas of human-use resources, use the SOCECON layer of the browser.

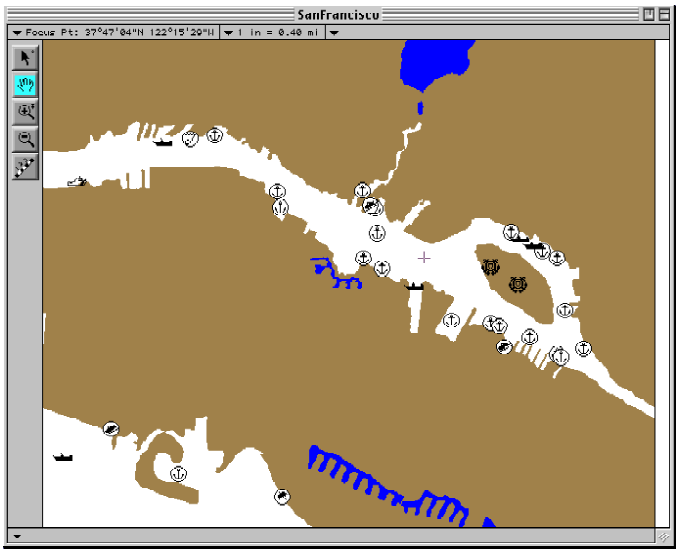
1. Click **Go To MARPLOT**, then use the shortcut keys (**Ctrl+L** in Windows or ⌘L on a Macintosh) to open the **Layer List** dialog box. In the dialog box, turn off the BIRD and NESTS layers and turn on the SOCECON layer.

MARPLOT will display the map with many symbols.



2. Use the hand tool, , and zoom tools, , to find an area with a variety of socio-economic symbols.

Here, a zoomed-in version of the map shows marinas, boat ramps, recreational and commercial fishing areas, a ferry terminal, a State beach, and two U.S. Coast Guard centers.

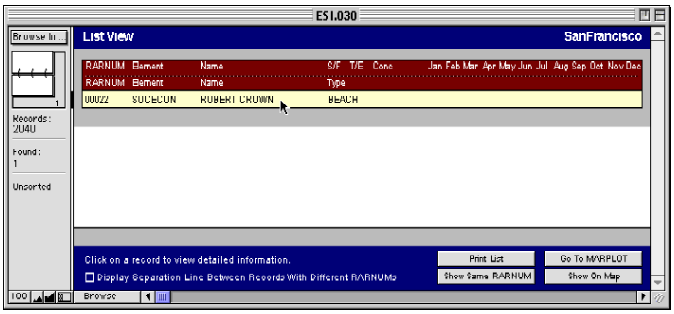


3. To learn more about any area represented by a symbol, use the arrow tool to select the symbol on the map.

A selected symbol looks like this: .

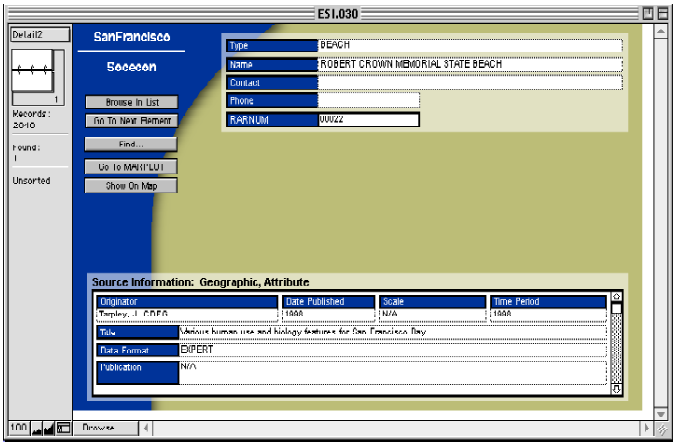
An explanation of the symbol will appear in the lower left corner of the map window. For example, the symbol selected above is noted in the lower left corner as a commercial fishing site in the SOCECON layer of the San Francisco Bay atlas.

4. To get more detailed information about the selected resource, press the shortcut keys, **Ctrl+I** (in Windows) or ⌘**I** (on a Macintosh).



In some cases, little is known about an area, so the List View may simply tell you the SOCECON type. Where it is available and appropriate, a site name may also be provided.

5. Click the record in the dialog box to get additional information, including source citations.

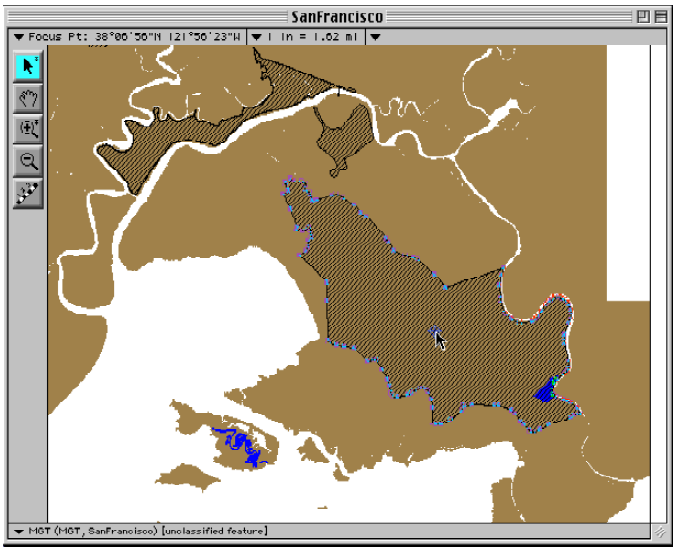


Follow these steps to learn about managed areas in the data layer, MGT.

1. Return to MARPLOT, then use the shortcut keys or the **List** menu to turn off the SOCECON layer and turn on the MGT layer.

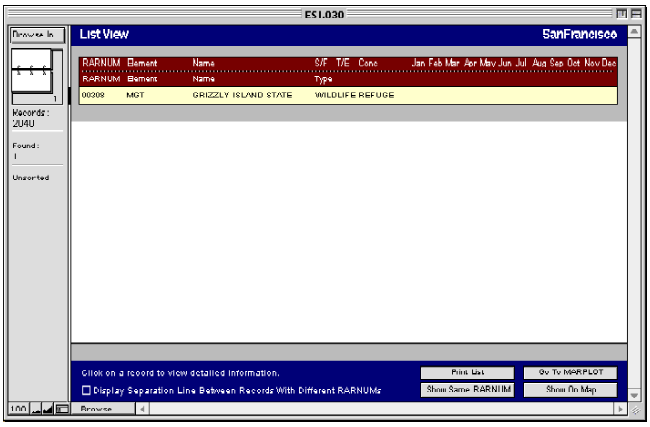
MARPLOT displays the map with polygons shaded like this: . (Over land regions, MGT layer polygons look like this: .)

2. Use the hand tool and zoom-in tool to get a better view of any MGT polygon.



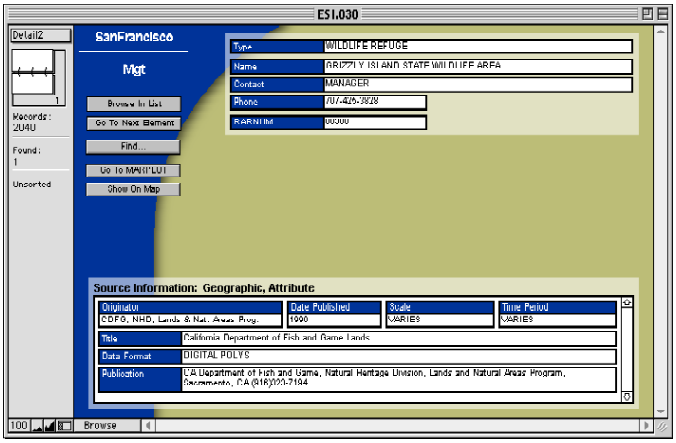
3. Use the arrow tool, , to click one MGT polygon (as shown above), then press the shortcut keys, **Ctrl+I** (in Windows) or ⌘**I** (on a Macintosh), to get information about the selected management region.

The managed area shown in the map above is listed in the browser as a wildlife refuge, Grizzly Island State Wildlife Area.



4. Click the listed record to get more detailed information about the managed or protected area.

The browser shows this contact and reference information for Grizzly Island State Wildlife Area.



Quitting the ESI Viewer

When you've completed your work with the ESI Viewer, you will close the Information Browser and MARPLOT. To close the browser, just choose **Quit** from the **File** menu if you're using a Macintosh, or **Exit** from the **File** menu if you're using Windows.

You can close MARPLOT by following the same steps. MARPLOT automatically saves the last settings when it closes.

Learning More

You've just completed an initial guided tour of the ESI Viewer. At this point, you should be able to determine shoreline types, find biological resources that occur in various areas of the map, and identify human uses of coastal areas. To further build your skills at using the viewer, we encourage you to formulate your own queries to answer questions relevant to your situation.

You may find that the viewer can help you in your own work. The ESI Viewer is an appropriate tool for a variety of purposes. Here are just a few:

- improving your understanding of resources that could be affected by an oil spill in a coastal region where you have planning responsibilities, or where you are a spill responder.
- conducting tabletop exercises to train spill responders.
- preparing classroom demonstrations, exercises, or science projects.

You can find other materials to help you to understand and use ESI at **http://response.restoration.noaa.gov/esi/esiintro.html** . Good luck with your work!