CDAS 3.11 – Marine Birds and Mammals at Sea

Guide for Users

Installation

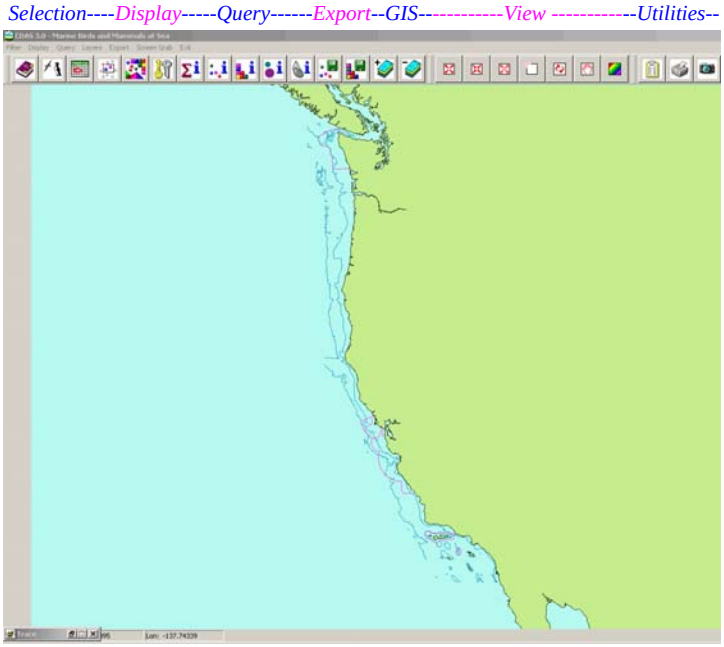
To install CDAS3, run CDAS3INSTALL.EXE from the CD. This will install CDAS3 into a root level directory named CDAS (i.e. C:\CDAS). This will happen automatically; it is not necessary to designate this directory.

Running CDAS

Initiate the program by double-clicking on ***CDAS3.exe*** in the CDAS directory, or on a shortcut you have constructed. An image will appear, then the screen will clear and the opening window will be displayed. This process may take a minute or two. Once the data are loaded into memory, CDAS operations are relatively fast.

Opening Window:

The opening window of CDAS shows the general extent of the data. The default data set includes offshore data from many studies (see **Summary of Studies** below) and spanning the period 1975-2008. The data range geographically from the northwestern tip of Washington to the Mexican border. National Marine Sanctuary boundaries and the 200m and 2000m bathymetry lines are also shown.



CDAS is controlled by menus and icons, as detailed below.

You will want to begin with **Data Selection** and experiment with **Data Display** and **Data Query** options. In addition to on-screen displays, output includes GIS and database files, query results tables, and graphic screen capture.

ICONS AND MENUS

Data Selection

Several icons and menus serve to refine the data selection. By default all studies, all dates, and the complete geographic range are selected. No species are preselected; ***it is always necessary to select species..***

	**Select Studies**	Allows the selection of one or more studies to be analyzed and displayed.
	**Select Species**	Allows the selection of up to 200 species from an interactive menu. Species are listed by common name in taxonomic order, as defined in ***spplist.csv***. Only 160 species can be differentiated visually.
	**Select Date Range**	Allows the selection of one or two date ranges from an interactive menu; the minimum selection is one day. By default, all dates are selected.
	**Select Region**	Allows the selection of a rectangular geographic data region using the mouse. Click and drag to define the box, release the mouse button to execute. By default, all data are selected.

Data Display

Check boxes on these two menus determine the format of the data displays and which legends are visible. Colors used for observations and density cells may be changed by clicking on the item in the legend to invoke the color menu.

	**Select Data Types**	Determines selection of data types to display, including observations, density cells, effort cells, contours, etc. Several data types may be displayed simultaneously. This menu also sets grod size and may be used to exclude large flocks or minimum survey effort.
	**Select Key Types**	Determines which keys will be displayed, including observations, density cells, effort cells, etc. Each key will open in its own window.

Data Query

Results of several types of interactive data query, including individual observations, and summary data within areas. Clicking on an observation, cell, or polygon will add those data to a table which may then be saved in *.csv* format.

	**Data Summary**	Displays a summary of the data selected, including number of studies, number of species, number of observations, etc.
	**Query Observation**	Using selected data, displays a table of observation data points selected interactively from the screen; table contents may be saved in *.csv* format.
	**Query Cell**	Using selected data, displays a table of density cell data selected interactively from the screen; table contents may be saved in *.csv* format.
	**Query Polygon**	Using selected data, displays a table of densities, counts, and effort within named polygons. Requires addition of polygon layer – see **Add GIS Layer**. Table contents may be saved in *.csv* format.
	**Resources at Risk**	Using selected data, displays a table of densities and populations at risk by species within each named polygon. Requires addition of polygon layer – see **Add GIS Layer**. Table contents may be saved in *.csv* format.

Data Export

Exports results of data selection in ArcView Shape file and *.csv* formats.

	**Export Observations**	Based on selected data, exports observation data as ArcView Shape file and in *.csv* format.
	**Export Cells**	Based on selected data, exports density cell data as ArcView Shape file and in *.csv* format.

GIS Layers

Line or Polygon GIS layers in geographic coordinates may be added to the basic display. Polygon layers added in this way may be used in the **Query Polygon** and **Resources at Risk** functions, useful for determining densities within spill polygons or other areas of interest. GIS layers should be in ArcView Shape File format.

	**Add GIS Layer**	Opens File Browser in the CDAS directory, from which you may navigate to other folders as needed. Click once on the layer you want to add. The name of that file will appear in the [File name:] field. Click [OPEN]. CDAS will redraw the screen and the added layer will be displayed.

	**Remove GIS Layer**	Opens the Layers dialog box. The left portion of the menu lists all the currently selected GIS layers. The right portion of the menu lists the GIS layers you wish to remove from the screen. To remove a layer, highlight the name(s) and [MOVE>] it to the right hand portion of the listbox. To remove all layers, choose [MOVE ALL>>]. You can adjust your selection as you like; when you are satisfied, choose [ACCEPT]. CDAS will redraw.

View

Activates various screen view functions.

	**Zoom Out**	Creates a wider view with the current screen view as the center. The magnification factor is 2.
	**Zoom In**	Allows you to view a selected area of the screen in more detail. A cursor will appear; click in the center of the area of interest.
	**Zoom to Extent**	Executes a Zoom such that your selected data occupies the central portion of the view screen.
	**Window**	Allows the definition of a new screen view by the creation of a box. Left click and drag to define the box – releasing the mouse button will execute the window.
	**Refresh Screen**	Refreshes the screen display.
	**Pan**	Moves the map view without changing the scale. Click and hold the left mouse button to move the map, releasing button when it is in the desired position.
	**Set Background Color**	Enables the color menu so that you may choose a different background color. Affects the ocean area only.

Utilities

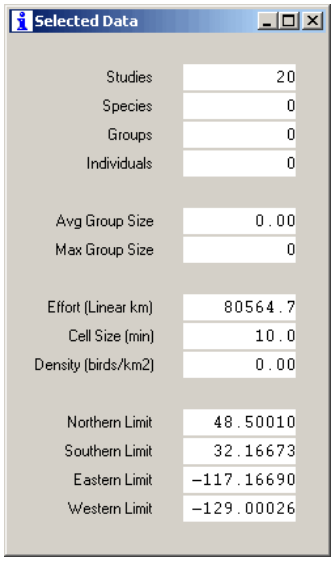
There are several ways to capture graphical output resulting from data selection and display choices:

	**Copy Image to Clipboard**	Places a copy of the current contents of the main screen on the clipboard,from which it may be pasted into many applications, including Word, Powerpoint, or Paint. From Paint or another image program, it may be saved in a variety of graphic formats.
	**Print Screen**	Prints the current view using the Windows printer interface.
	**Copy Image to JPG**	Copies the current view in JPG format.

SAMPLE APPLICATIONS

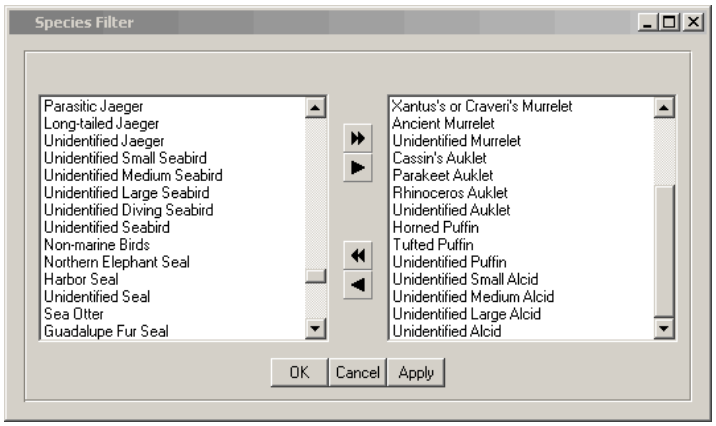
Data Exploration

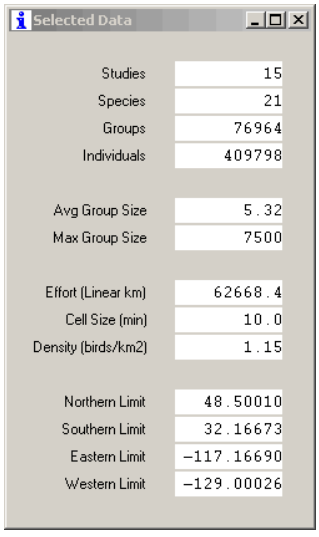
The **Data Summary** function creates a display summarizing data selected. By default, CDAS opens with all studies, all dates, and the entire geographic range of the data pre-selected. No species have been selected.



This display will change as data selection continues.

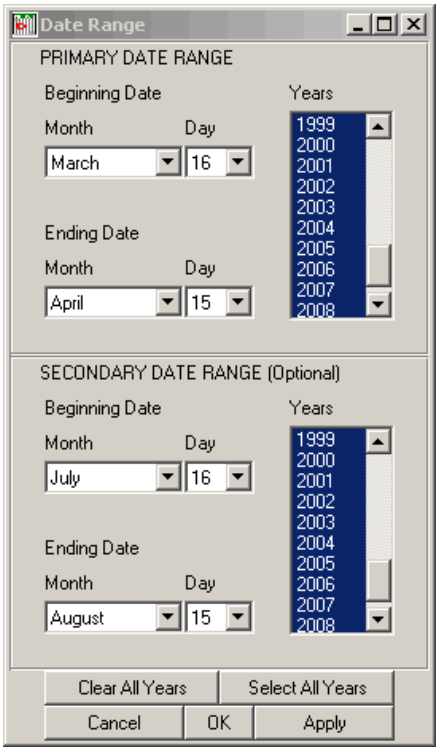
Using the **Select Studies** function, select the studies to be used, and using the **Select Species** function, select the species to be displayed. In the example below, all alcid species are chosen.

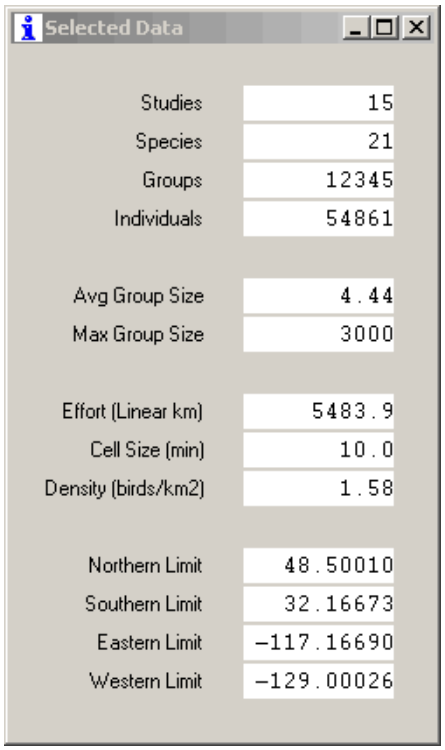




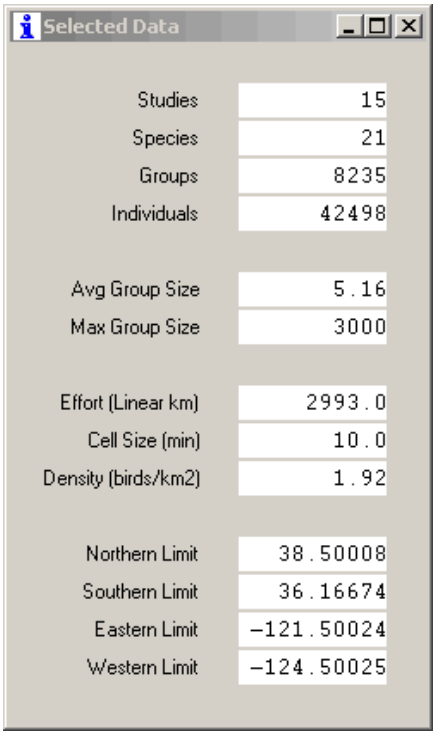
Summary information on the selected species is shown.

Using the **Select Date Range** function, specific time periods may be chosen. In this example, all years are used, but only certain date ranges are included. This changes the summary to include only observations and effort in those time periods.

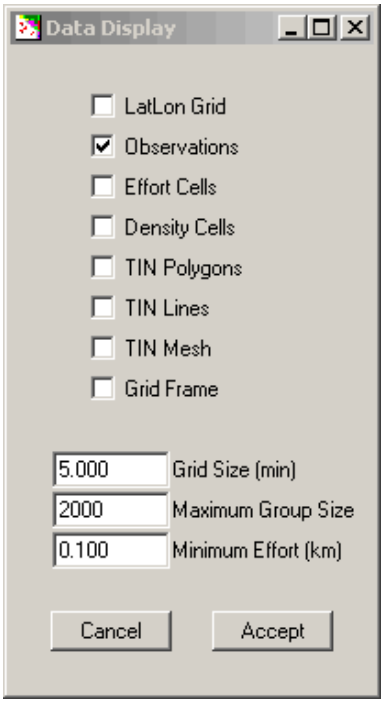


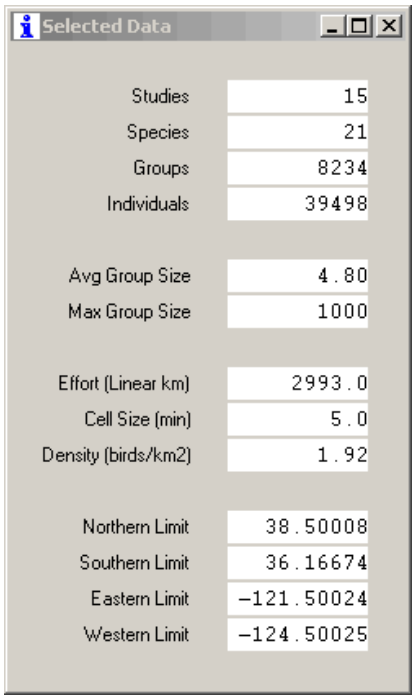


The **Select Region** function allows creation of a window, further restricting the data shown.

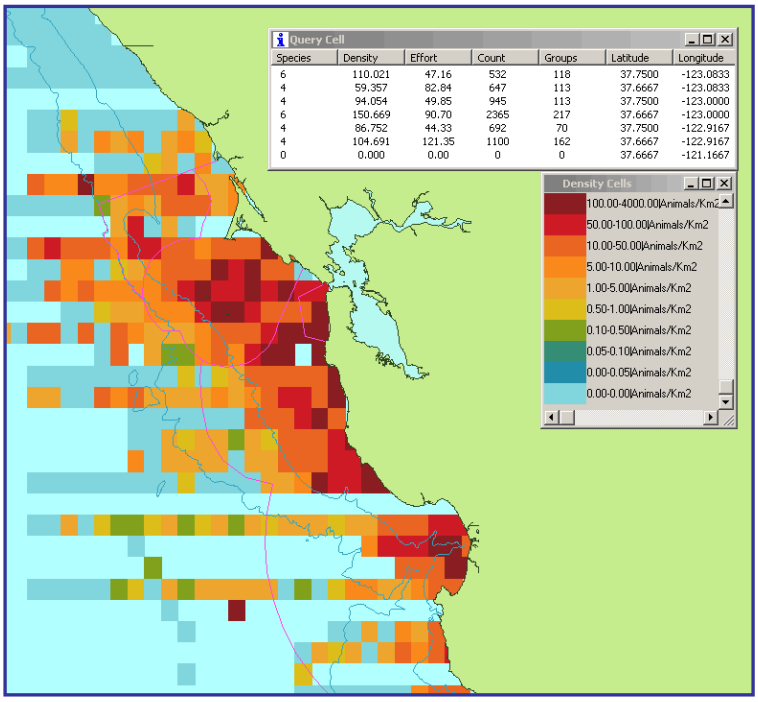


Because densities may be affected by samples with little effort values or by sightings of large flocks, it may be useful to exclude these values from the analysis and display. Thresholds for these items may be set using the **Select Data Types** menu. This is also where you choose graphic display options.

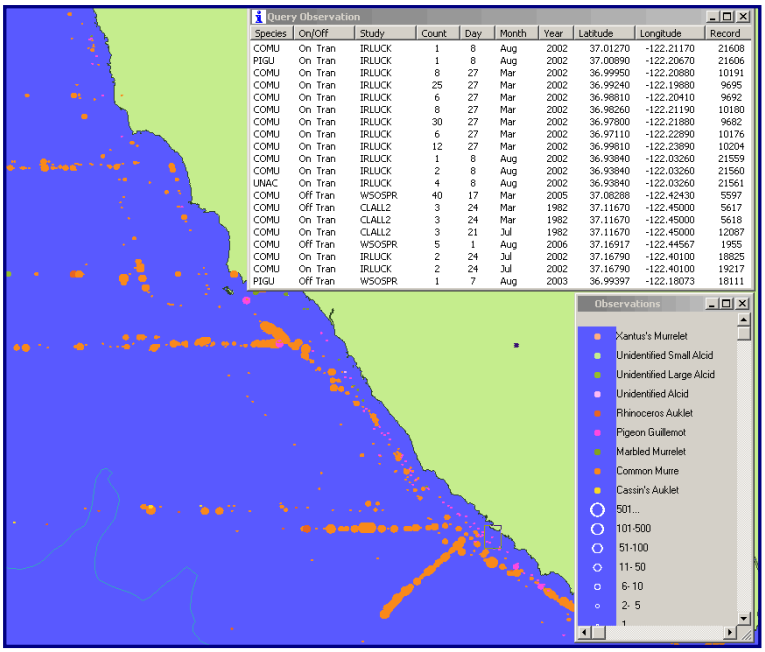




Results of **Query Cell** operation using the data selected above. Seven cells around the Farallon Islands were chosen interactively. Effort is expressed in linear km, and density is expressed in animals per square km.



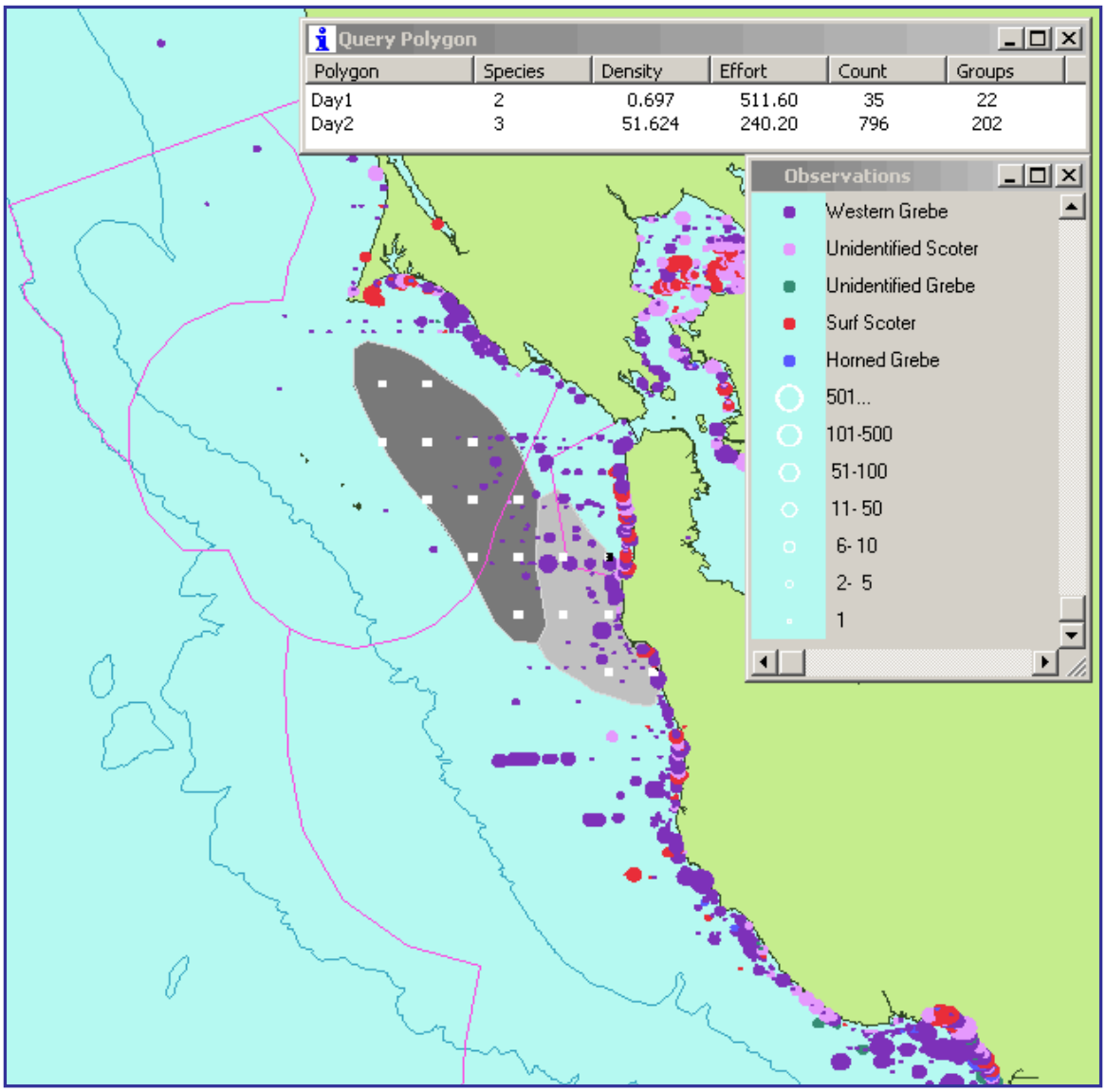
Results of **Query Obs** operations using the selected data. Individual observations were chosen interactively. Using the study code and the record number, the individual record in the original data file may be located.



Oil Spill Response Query 1

By adding GIS files of named polygons (in this case, Day1 and Day2 of an oil spill), and querying using the **Query Polygon** function, a quick summary of resources at risk may be generated. In this case, underlying data are grebes and scoters seen from 15 January through 29 February in many years, based on several studies combined.

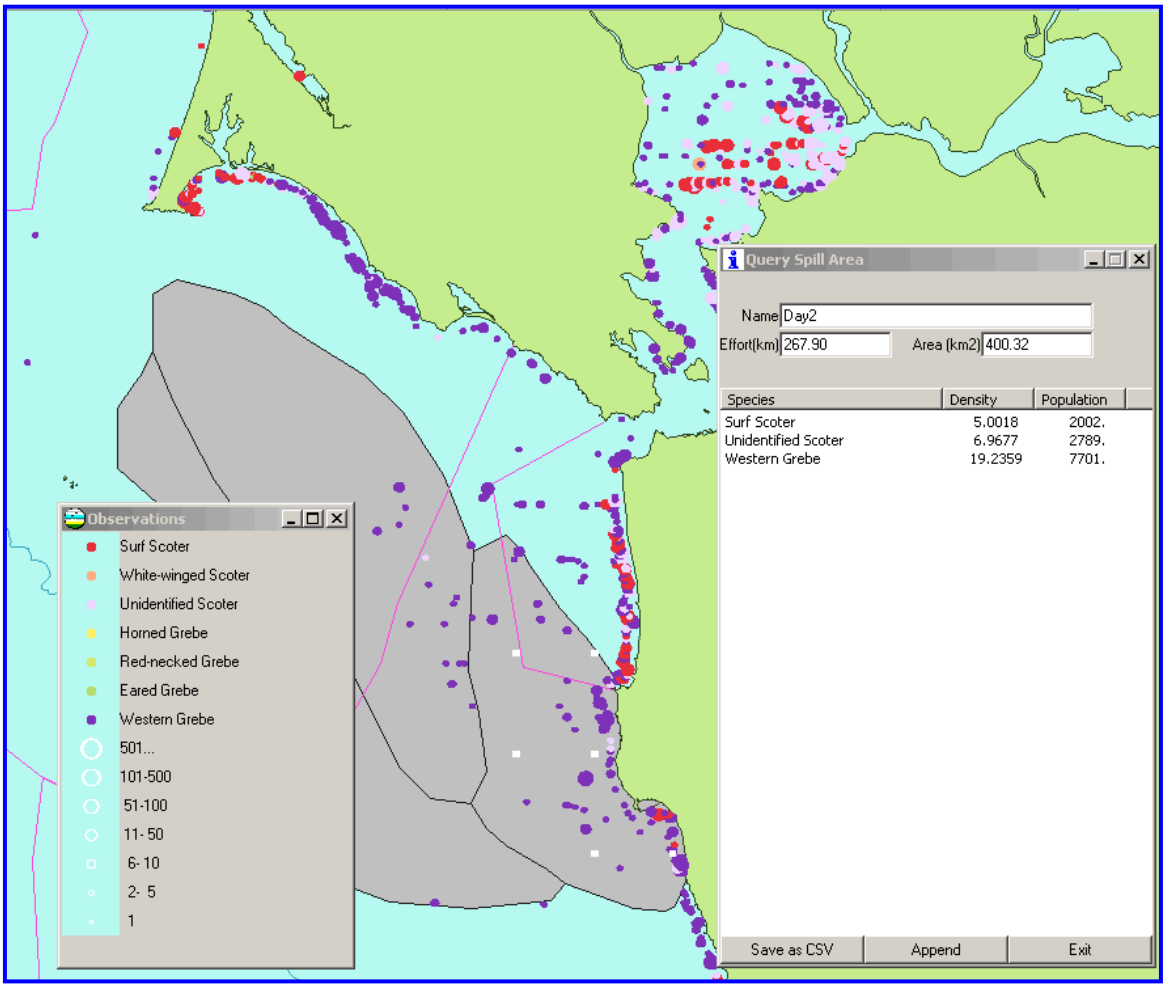
Results summarize all selected species by polygon. Effort is expressed in linear km, and density is expressed in animals per square km.



Oil Spill Response Query 2

By adding GIS files of named polygons (in this example, Day1, Day2, and Day 3 of an oil spill), and querying them using the **Resources at Risk** function, a quick inventory of resources at risk may be generated. In this case, underlying data are grebes and scoters seen from 15 January through 29 February in many years, based on several studies combined.

Results are presented in the *Query Spill Area* box for each polygon as it is selected. Selected species are presented individually as densities in animals per square km; densities are applied to the polygon area to arrive at the estimated population at risk. To save results, save the first polygon query as a *.csv* file. Select additional polygons and choose *Append* to add additional results to this file.

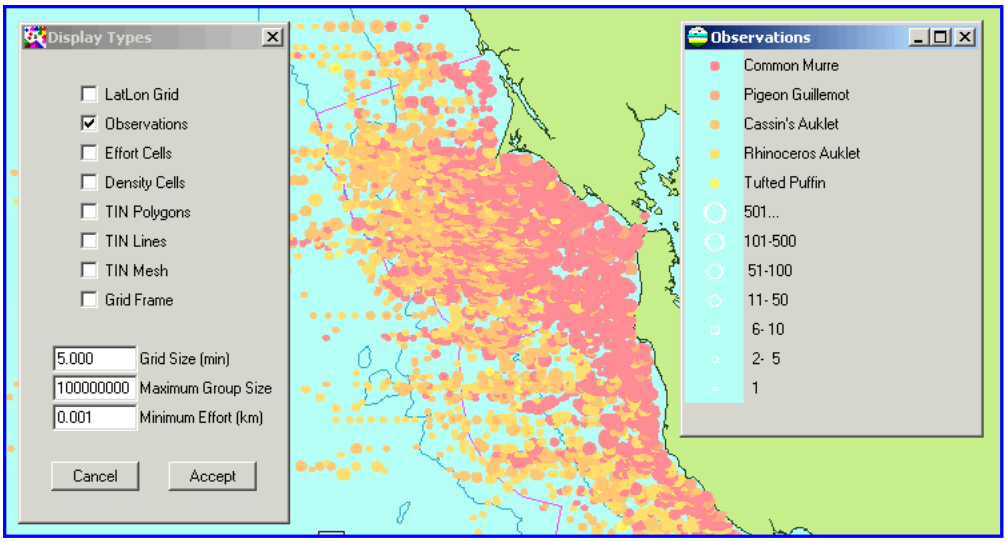


ABOUT THE DISPLAYS

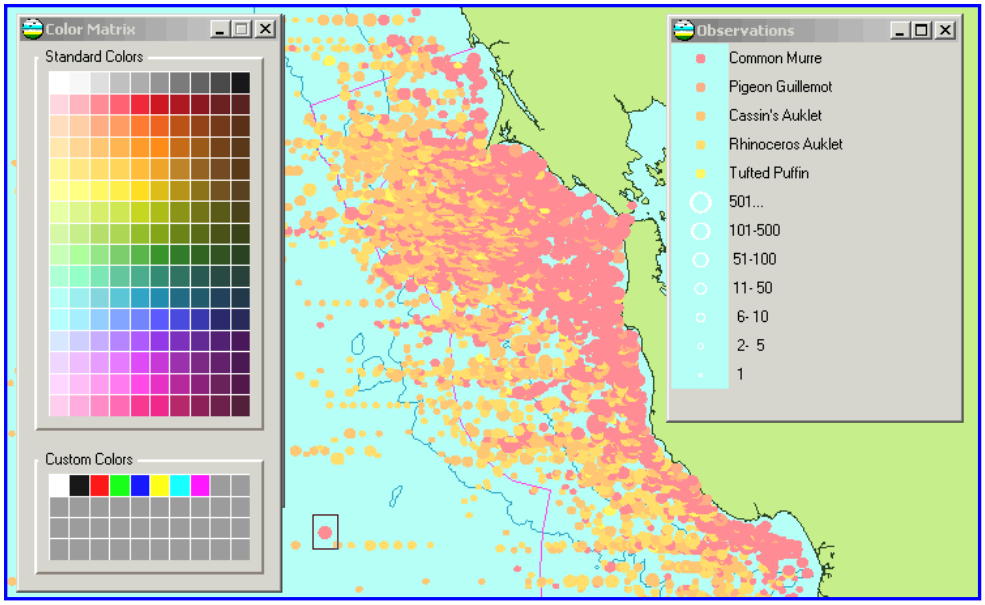
Results are displayed in the following order (bottom to top) Effort Cells, Density Cells, Latitude-Longitude Grid and Grid Frame, Density Contours, TIN Displays, GIS Layers, Observations). It may be necessary to turn off some displays in order to see others.

Some display colors may be changed for easier visualization; these changes are volatile and will disappear when CDAS3 is closed.

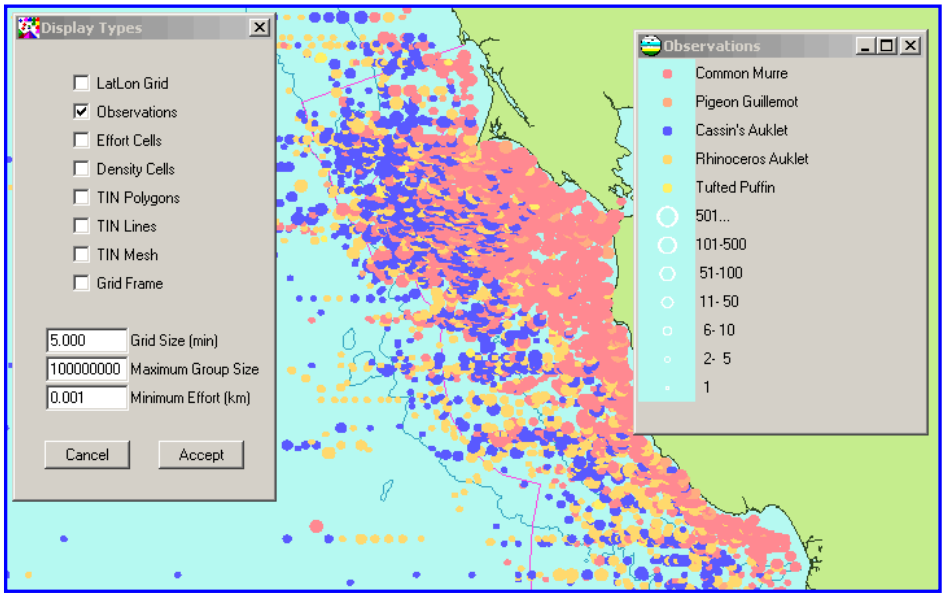
The observation display will automatically assign colors to the selected species.



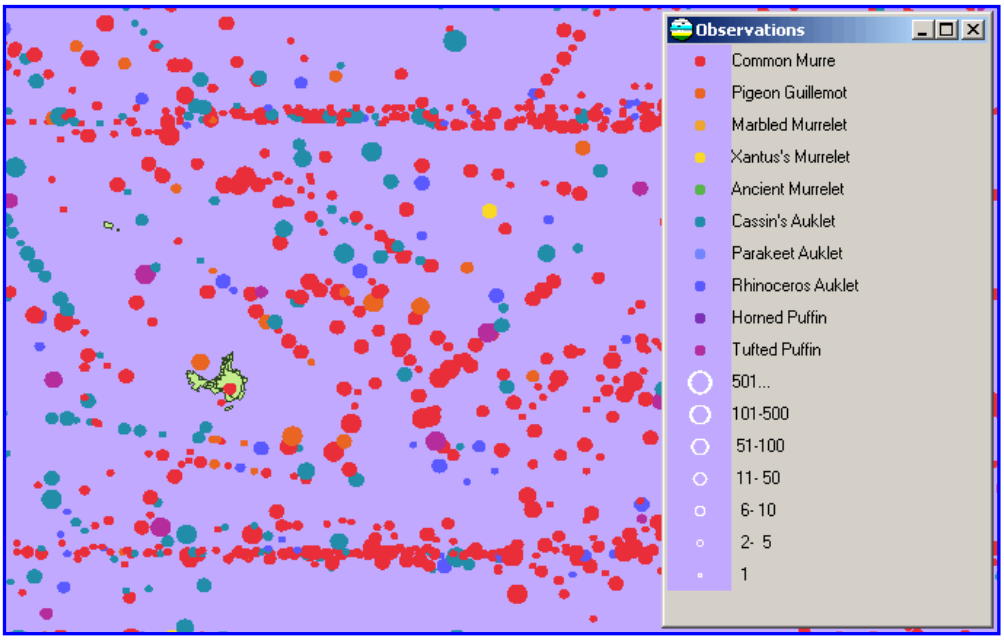
Clicking on a dot in the key will bring up the Color Matrix for color selection; the user may then select an alternative color.



This feature can be used to highlight species of particular interest as shown below:



The background color may be changed by selecting the **Background Color** icon on the top bar; this brings up the Color Matrix. Results of such a color change are shown below.



DATA STRUCTURES

Species List

A file used to construct the **Select Species** menu. This is a file in *.csv* format, default name *spplist.csv*, example below:

4CODE	COMMON NAME	SCIENTIFIC NAME
COMU	Common Murre	*Uria aalge*
TBMU	Thick-billed Murre	*Uria lomvia*
UNMU	Unidentified Murre	*Uria spp.*
PIGU	Pigeon Guillemot	*Cepphus columba*
MAMU	Marbled Murrelet	*Brachyramphus marmoratus*
XAMU	Xantus's Murrelet	*Synthliboramphus hypoleucus*
CRMU	Craveri's Murrelet	*Synthliboramphus craveri*
XCMU	Xantus's or Craveri's Murrelet	*Synthliboramphus hypoleucus or S. craveri*
ANMU	Ancient Murrelet	*Synthliboramphus antiquum*
UNML	Unidentified Murrelet	*Brachyramphus or Synthliboramphus spp.*
CAAU	Cassin's Auklet	*Ptychoramphus aleuticus*
PAAU	Parakeet Auklet	*Cyclorrhynchus psittacula*

Study List

A file used to construct the **Select Studies** menu, and to define the observation and effort files to be used for each study. This is a file in *.csv* format, default name *obseff.csv*, example below:

OBS	EFF	STUDYCODE	STUDYNAME
OBSEFF\CLALL2obs.csv	OBSEFF\CLALL2eff.csv	CLALL2	AIR - Cenl/Nor Calif. Low Aerial 1982-1983
OBSEFF\OWPELBobs.csv	OBSEFF\OWPELBeff.csv	OWPELB	AIR - Oregon/Washington Pelagic
OBSEFF\SLOBRDobs.csv	OBSEFF\SLOBRDeff.csv	SLOBRD	AIR - Birds - So. Cal. Bight Low Aerial 1975-1978
OBSEFF\MMSSBCobs.csv	OBSEFF\MMSSBCeff.csv	MMSSBC	AIR - MMS Santa Barbara Channel
OBSEFF\WOSPR5Obs.csv	OBSEFF\WOSPR5Eff.csv	WOSPR5	AIR - OSPR Wildlife Surveys 1994-2003
OBSEFF\WSOSPRObs.csv	OBSEFF\WSOSPREff.csv	WSOSPR	AIR - OSPR Wildlife Surveys 2004-2008
OBSEFF\IRLUCKobs.csv	OBSEFF\IRLUCKeff.csv	IRLUCK	AIR - Luckenbach Surveys
OBSEFF\OWPELMobs.csv	OBSEFF\OWPELMeff.csv	OWPELM	AIR - Mammals - Oregon/Washington Pelagic
OBSEFF\SLOMAMobs.csv	OBSEFF\SLOMAMeff.csv	SLOMAM	AIR - Mammals - So. Cal. Bight Low Aerial
OBSEFF\CHIMAMobs.csv	OBSEFF\CHIMAMeff.csv	CHIMAM	AIR - Mammals - Cenl/Nor Calif. High Aerial

Observation Files

Observation files contain records of individual sightings, and fields used may vary from study to study. To be usable by CDAS, they must be in *.csv* format and contain certain fields, in any order, named as follows:

STUDY	The Study Code (6 characters)
ONEFF	Y or N (whether the sighting was on effort or not)
YEAR	Year (YYYY)
MONTH	Month (MM)
DAY	Day (DD)
SPP	Species code, per *spplist.csv*. If the original data use different species codes, these may be preserved in a separate field not named SPP.
COUNT	Number of individuals
LATITUDE	Decimal latitude

LONGITUDE	Decimal longitude (West is positive)
WIDTH	Strip width, in km – To be updated in future to include other correction factors.

The species codes used in SPP must conform to the usage in *spplist.csv*. STUDY codes must conform to those listed in *obseff.csv*. ***West longitude is positive.*** For convenience, because of row limits in Excel, if there are more than ~64K records in an observation file, the file should be divided and presented as two files with different study codes. Corresponding effort files should follow the same convention, so that paired files use the same study code.

Effort Files

Effort files contain records of linear effort by cell, day, and study, and may contain other data as well. To be usable by CDAS, they must be in *.csv* format and contain certain fields, in any order, named as follows:

STUDY	The Study Code (6 characters)
YEAR	Year (YYYY)
MONTH	Month (MM)
DAY	Day (DD)
LATITUDE	Decimal latitude
LONGITUDE	Decimal longitude (West is positive)
BINSIZE	Cell size (minutes of latitude/longitude)
EFFKM	Linear KM of transect

STUDY codes must conform to those listed in *obseff.csv*. ***West longitude is positive.*** For convenience, because of row limits in Excel, if there are more than ~64K records in an effort file, the file should be divided and presented as two files with different study codes. Corresponding observation files should follow the same convention, so that paired files use the same study code.

SUMMARY OF STUDIES

The current data set includes 25 studies; more may be added. Care should be taken when combining surveys. For example, when creating composite bird data, no Mammal or Cetacean only surveys should be used. *Any densities so constructed will be wrong.*

STUDY CODE	Taxa*	Name	Investigator	Years	Plat-form
SCBSHP	B/M	So. Cal. Bight	Briggs/Bonnell/Dohl	1975-1978	SHIP
OWMLFR	B/M	Miller Freeman Cruise	K. Briggs	1989	SHIP
SLOBRD	B/M	So. Cal. Bight Low Aerial [B]	K. Briggs	1975-1978	AIR
CLALL1	B/M	Cenl/Nor Calif. Low Aerial 1	K. Briggs/M. Bonnell	1980-1981	AIR
CLALL2	B/M	Cenl/Nor Calif. Low Aerial 2	K. Briggs/M. Bonnell	1982-1983	AIR
SBECOL	B/M	Seabird Ecology Study Aerial	K. Briggs	1985	AIR
OWPELB	B/M	Oregon/Washington Pelagic [B]	K. Briggs	1989-1990	AIR
WOSPR5	B/M	OSPR Wildlife Surveys 1	Bonnell/Tyler	1994-2003	AIR
MMSSBC	B/M	MMS Santa Barbara Channel	Bonnell/Pierson	1995-1997	AIR
WSOSPR	B/M	OSPR Wildlife Surveys 2	W. Tyler	2004-2008	AIR
IRLUCK	B/M	*Luckenbac*h Surveys	W. Tyler	2001-2003	AIR
IRKURE	B/M	*Kure* Surveys	M. Bonnell	1997	AIR
IRSTUY	B/M	*Stuyvesant* Surveys	W. Tyler	1999	AIR
IRCOBU	B/M	*Cosco Busan* Surveys	W. Tyler	2007	AIR
IRCOMM	B/M	*Command* Surveys	W. Tyler	1998	AIR
IRSBCH	B/M	Ventura Oiled Bird Incident	W. Tyler	2005	AIR
LHMAMA	B/M	LH Marbled Murrelet Surveys 1	L. Henkel	2005-2006	AIR
LHMAMB	B/M	LH Marbled Murrelet Surveys 2	L. Henkel	2005-2006	BOAT
MAMUMB	B/M	LH Monterey Bay	L. Henkel	2003-2004	BOAT
MAMUCC	B/M	LH Central California	L. Henkel	2007	BOAT
ANUEVO	B/M	LH Año Nuevo	L. Henkel	1999-2002	BOAT
SLOMAM	**M**	So. Cal. Bight Low Aerial [M]	M. Bonnell	1975-1978	AIR
SHIMAM	**C**	So. Cal. Bight High Aerial [C]	T. Dohl	1975-1978	AIR
CHIMAM	**C**	Cenl/Nor Calif. High Aerial [M]	T. Dohl	1980-1983	AIR
OWPELM	**M**	Oregon/Washington Pelagic [M]	J. Brueggeman	1989-1990	AIR

* B/M = Birds and Mammals, **M** = Mammals Only, **C** = Cetaceans Only.

Detailed information on these studies, including references, is provided in an Appendix.