

TECHNICAL NOTE

USDA NATURAL RESOURCES CONSERVATION SERVICE PACIFIC ISLANDS AREA

Biology Technical Note 13

CANDIDATE, THREATENED & ENDANGERED SPECIES INVENTORY

PURPOSE OF TECHNICAL NOTE

This technical note is intended to assist in preparing an off-site inventory of plants and animals found within and surrounding proposed project areas. These guidelines should be used when producing maps and tables for Endangered Species Act section 7 compliance and to comply with NRCS Endangered Species policy. This technical note consists of the following three parts:

- Part I: Completing a Candidate, Threatened and Endangered Species Map
- Part II: Completing a Candidate, Threatened and Endangered Species Data Table
- Part III: References

This technical note, as well as all other Pacific Island Technical Notes, is available online at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/pia/technical/?cid=nrcs142p2_037391

PART I: CANDIDATE, THREATENED AND ENDANGERED SPECIES MAP (CT&E MAP)

The species occurrences (points and areas) used to create the CT&E Map are obtained in part through our subscription to the Hawaii Biodiversity and Mapping Program (HBMP). The HBMP database is Hawaii's largest computerized inventory of endangered, threatened and rare plants, animals and ecosystems, and is compiled from all available sources. Additionally, the U.S. Fish and Wildlife Service (FWS) provides us with supplementary species occurrences (points and areas) that must also be considered when creating the CT&E map. For Guam and the Mariana Islands, the species locations were developed from reports, manuscripts and unpublished data available at the U.S. Fish and Wildlife Service's Pacific Islands Fish and Wildlife Office. This information was compiled into the Guam/CNMI database.

The CT&E Map is used for two main purposes: (1) as a planning tool; and (2) to determine the effect(s) of proposed practices on rare species.

As a planning tool, the CT&E Map should be prepared to create an off-site inventory of native plants and animals prior to an NRCS site visit. The map can assist in advising a client about particular programs (e.g., EQIP) and to offer additional information to the client about the property.

To determine the effect(s) of the proposed practices, as required under section 7(a)(2) of the ESA and NRCS policy, the CT&E Map can illustrate the spatial relationship between the project area, or Area of Potential Effects (APE), and candidate, threatened, and endangered species as well as designated and proposed critical habitat.

Ideally, a map and associated table should be prepared before making plan alternatives or a determination of effect of the proposed conservation practices. The CT&E Map must display: (1) the APE, (2) any CT&E species occurrences or designated critical habitat areas or proposed versions of both, and (3) a 1/3-mile APE buffer. Following are some guidelines to assist you in producing the CT&E Map. A sample CT&E Map is printed on page 13.

A. CT&E Required Data Layers

All of the required data layers (shapefiles) for creating the CT&E Map are available on your local geodata server in the “[endangered_habitat](#)” folder. Please ensure the species data on your local disk drive ([C:\geodata\endangered_habitat](#)) is up-to-date. The project area buffer will be unique for each CT&E map and must be created in Toolkit using the boundaries of the specific project/action area.

For Hawaii, all layers are contained within a file geodatabase named “[t_e_species_hi00x.gdb](#)”. For all files, hi00X = 001 for Island of Hawaii, 003 for Oahu, 007 for Kauai, and 009 for Maui County (Maui, Molokai, Lanai, and Kahoolawe).

For Guam/CNMI, there is one layer for CT&E rare species and one layer for critical habitat, as detailed in the sections below.

Currently there is no designated critical habitat for American Samoa and NRCS does not have access to any official CT&E shapefiles. Maps still need to be created showing the project area and using any data available to the field office showing the known presence of CT&E species.

1. CT&E Point and Area Occurrences

Hawaii

CT&E point occurrences:

Rare species point occurrences indicate current and historic locations of observed plant and animal species. The GIS shapefiles for CT&E points are:

HBMP point data [[hbmp_rarespecies_p_hi00x](#)]

FWS point data [[fws_rarespecies_p_hi00x](#)]

CT&E area occurrences:

In addition to rare species points, there is an area (polygon) shapefile for rare species areas. This shapefile represents species occurrences observed in greater abundance and area than can be represented by a single mapped point.

The GIS shapefiles for CT&E areas are:

HBMP area data [[hbmp_rarespecies_a_hi00x](#)]

FWS area data [[fws_rarespecies_a_hi00x](#)]

Natural Diversity Database:

Both the CT&E species point and area occurrences have an attribute table associated with the shapefiles that includes basic information, such as, scientific name, accuracy and the last observation date. More detailed information for each occurrence is available in the Natural Diversity Database. This database is in MS Access format and available to NRCS employees at: [geodata/endangered_habitat/NaturalDiversityDatabase.mbd](#)

Guam/CNMI

Similar to the Hawaii data, the Marianas data represents rare species areas and includes an attribute table with basic species information. This table represents the best information currently available. Unlike the Hawaii species data, the Marianas data does not include a stand-alone database. The Marianas species data is located at: [geodata\endangered_habitat](#). Guam: [[fws_rarespecies_a_gu010](#)]. CNMI: [[fws_rarespecies_a_mp_allislands](#)].

CT&E Point and Area Occurrences - Important Attributes

Federal Status

The HBMP rare species shapefiles include, when applicable, the federal status of the plant and animal occurrences. The U.S. Endangered Species Act (USES) categories are as follows:

LE	=	Listed Endangered
LT	=	Listed Threatened
PE	=	Proposed Endangered
PT	=	Proposed Threatened
C	=	Candidate
SOC	=	Species of Concern

The data have been filtered to display “Listed”, “Proposed”, and “Candidate” data – occurrences designated as “LE”, “LT”, “PE”, “PT”, and “C”. Rarely, a species may have a different designation depending on its location, such as *Chelonia mydas* or Green sea turtle, which is listed as “Threatened” in the Pacific islands but “Endangered” elsewhere. In these rare instances, the species will be designated “LELT”, or some other combination, and should also be included on your map.

The FWS rare species and Guam/CNMI shapefiles include, when applicable, the federal status of the plant and animal occurrences. The Federal Status (FedStatus) categories are as follows:

E	=	Listed Endangered
T	=	Listed Threatened
PE	=	Proposed Endangered
PT	=	Proposed Threatened
C	=	Candidate

Last Observations

The rare species shapefiles also include the last observations – “LASTOBS” – of the point or area, some dating back to the 1800s. Your map should distinguish between “Current” and “Historic” occurrences. Current species occurrences are those observed within the last 20 years; historic occurrences are those observed more than 20 years ago.

You will find the observation type - Current (“C”) or Historic (“H”) - in a field called “OBS_TYPE”. This will help you to easily distinguish between these two occurrences on your final map.

In some cases, the exact year of an observation is not available. These occurrences have been coded as follows:

FWS data [LastObs]:

0 = Prior to 1970 but no specific year available

1 = Observed between 1970 - 1997 but no specific year available

2 = Observed between 1997 - 2010 but no specific year available

HBMP data [LASTOBS]:

0 = Prior to 1990 but no specific year available

1 = Observed between 1990 and 1999 but no specific year available

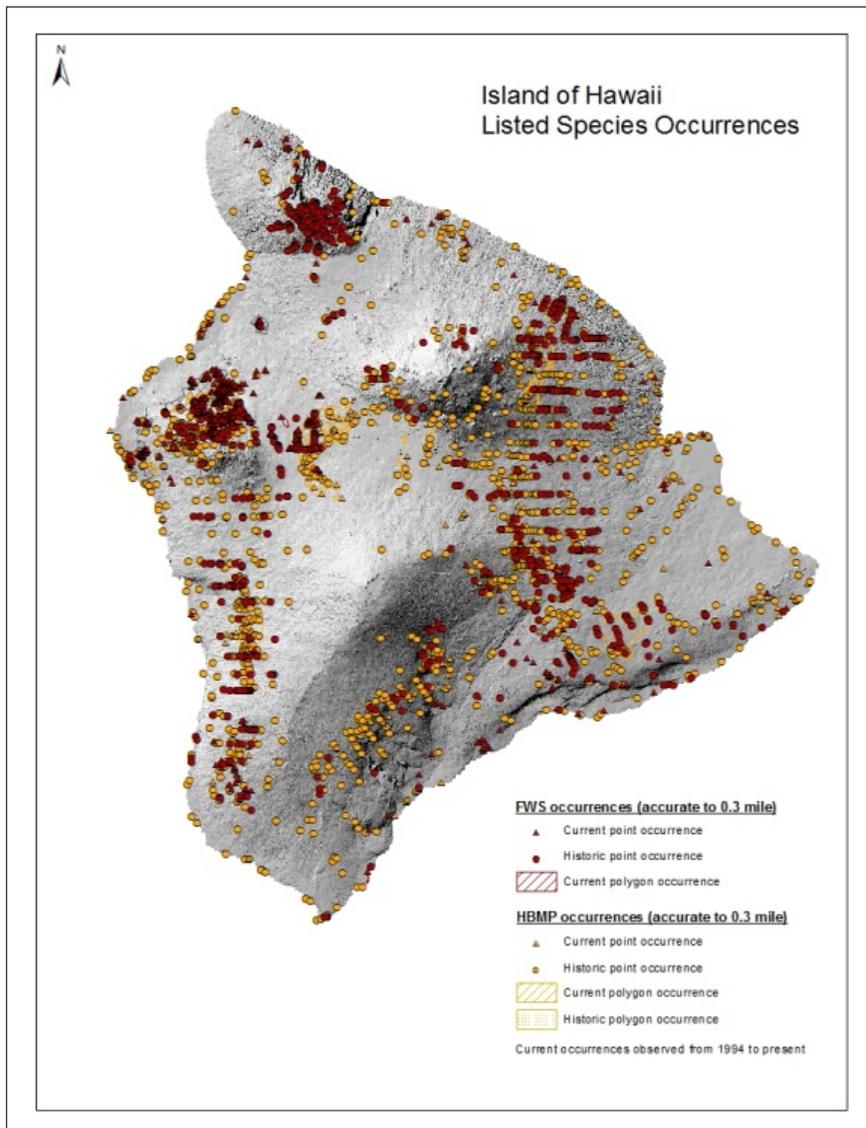
Guam/CNMI [LastObs]:

Unk = Unknown

Accuracy

Finally, the species point and area occurrences include observations with varying degrees of accuracy. The accuracy definitions are as follows:

- P = precise (1 meter accuracy)
- SC = specific (6 meter accuracy)
- S = specific (0.33 mile accuracy)
- M = medium (1.5 mile accuracy)
- G = general (5 mile accuracy)
- U = unmappable
- N = not mapped



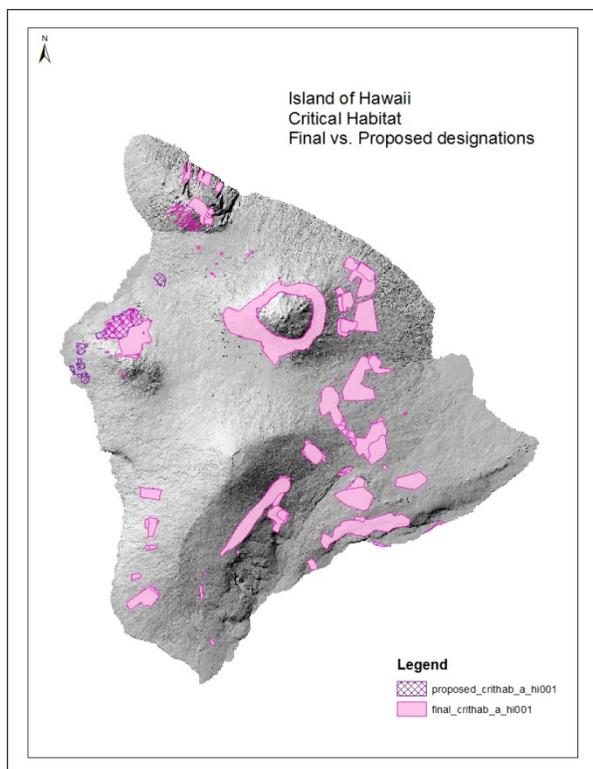
The data layers have been filtered to only display data accurate to 0.33 miles – that is, occurrences designated with “P”, “SC” or “S” accuracy.

The map at left illustrates the current and historic listed, accurate species points and areas for the Island of Hawaii.

2. Designated Critical Habitat

When creating a CT&E Map, use the critical habitat shapefiles. As US Fish and Wildlife Service and NOAA National Marine Fisheries Service continue to list species and propose and designate critical habitat, there may, at times, be shapefiles of proposed critical habitat. Proposed critical habitat will be made available through announcements from the State GIS Specialist and placed on the appropriate data server. When the proposal becomes final, the proposed critical shapefiles will be removed and the final critical habitat shapefiles updated. The map below illustrates the difference between designated critical habitat and proposed plant critical habitat on the Island of Hawaii. In general, the proposed critical habitat areas are larger than designated critical habitat.

For Hawaii, designated final critical habitat shapefiles are located within the file geodatabase named “[t_e_species_hi00x.gdb](#)”. Guam and CNMI have shapefiles available for final critical habitat areas. All critical habitat data layers are available on your local geodata server in the “endangered_habitat” folder.



Final Critical Habitat data:

Hawaii: [[final_crithab_a_hi00X](#)], where hi00X = 001 for Island of Hawaii, 003 for Oahu, 007 for Kauai and 009 for Maui County (Maui, Molokai, Lanai, and Kahoolawe).

Guam: [[final_crithab_a_gu010](#)]

CNMI (Rota): [[final_crithab_a_mp100](#)]

American Samoa:

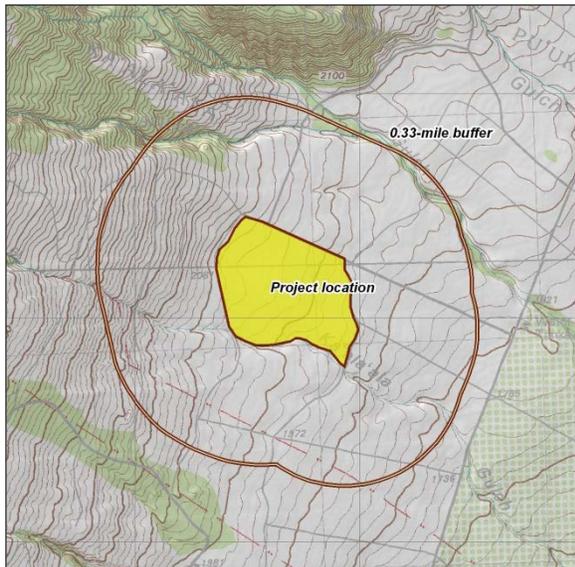
Currently there is no designated critical habitat for American Samoa and NRCS does not have access to any official shape files.

All Islands Note:

If proposed critical habitat files are available in your “endangered_habitat” geodata folder, they **must** be included on any map until they are removed from your server.

3. Project Location Buffer

In addition to the rare species occurrences and critical habitat units, your map must include a



0.33-mile ($\frac{1}{3}$ -mile) project area buffer (see map at left). This buffer takes into account both the accuracy of the data and mobility of the species. With regards to accuracy, a species occurrence with an accuracy rating of "S" represents an observation somewhere within 0.33 miles of the mapped point or area. By including a 0.33-mile project buffer, your analysis will take into account the farthest extent of the species' occurrence.

In addition to the accuracy of the species occurrence, both plants and animals have the ability to populate new areas. Plants have the ability to colonize or re-colonize suitable habitat. The 0.33-mile buffer takes into account both the mobility of a species and proximity of suitable habitat, and is a

reasonable measurement to estimate the extent to which a project may affect a species. For mobile animals (birds, bats, etc.) the species is considered possibly in the project area if the data (current and historic) shows the occurrence of those animals on a map at a 1:24,000 resolution (see below) with the project area centered in the map.

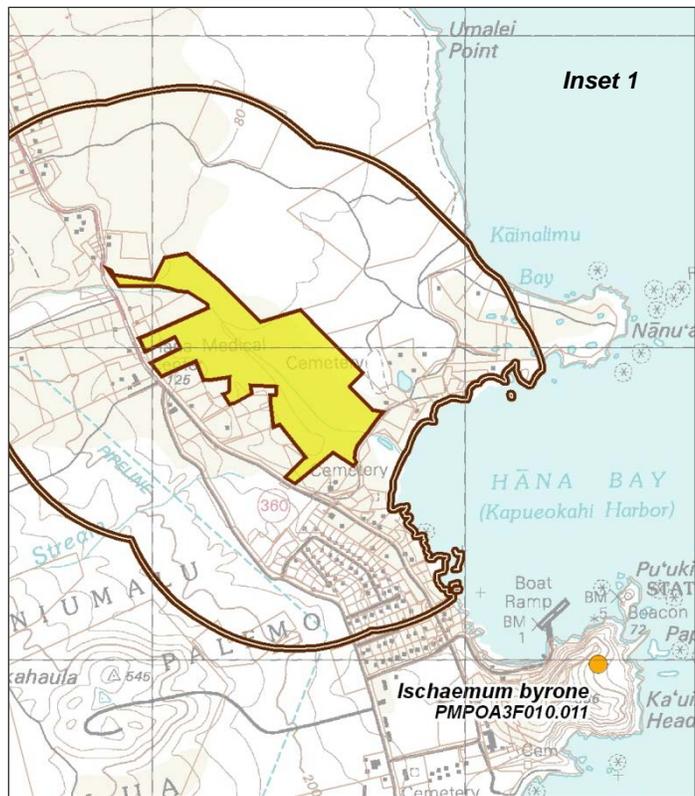
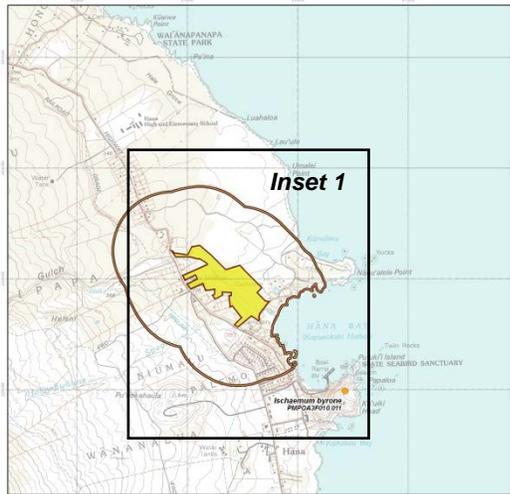
B. Map Design

1. Scale

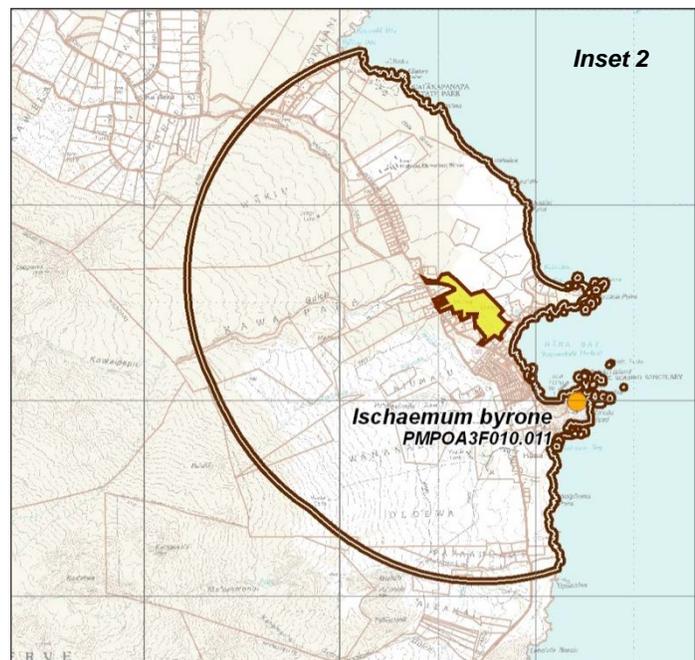
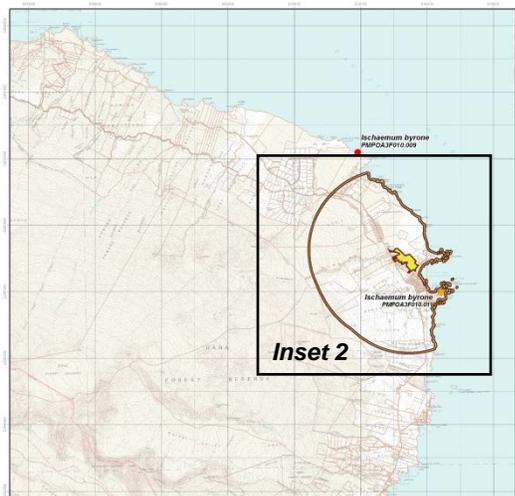
Scale is the relationship between the size or length of features on a map and the size or length of the corresponding objects in the real world. Scale is commonly expressed as a ratio or representative fraction (RF), such as 1:24,000 or $\frac{1}{24,000}$. This ratio translates to one unit on the map equivalent to 24,000 units on the earth. Another translation is the objects on earth are 24,000 times larger than the representative features on the map. Scale can also be expressed as a statement, such as 1 inch = 10 miles, or as a graphic bar.

You will commonly see references to two types of maps – large-scale and small-scale. A large-scale map refers to a map that has a relatively large RF. For example, a $\frac{1}{1,000}$ scale map is at a larger scale than a $\frac{1}{10,000,000}$ scale map. Generally, a large-scale map covers a small area in more detail, such as land parcel or building plan. A small-scale map covers a large area in less detail such as a world map or a map of the island chain.

In most cases, you will be preparing large-scale maps of the project area and associated buffer and should in most cases be produced at 1:24,000 (never less than 24,000). Your map should be at a scale that is large enough to include both the relevant project and buffer area and some surrounding geographic references. Although there may be instances when your project extends over a large area requiring a larger scale, the following examples should apply to most situations:

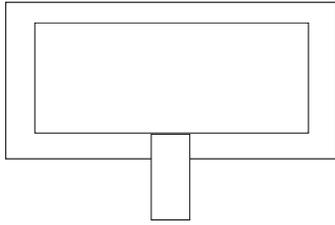


The map above was created at a scale of 1:24,000 (displayed here at 35% to view the entire map area). Inset 1 at right, displays a portion of the map at 100%. At this scale, the project and buffer areas are clearly the main focus. In addition, the surrounding geographic features (e.g., contour lines, streams, roads, etc.) are clear and legible, and help orient the reader. Compare these maps to those displayed below at a smaller scale of 1:80,000. At 1:80,000, the project and buffer areas are not the major focus when compared to the larger island land mass. Although there are many geographic features, they are too small to be readable and not very useful.



As before, the map above is displayed at 35% to view the entire map area. Inset 2 displays a portion of the map at 100%.

2. Required Map Elements



Scale: Your map should include a scale bar. While you may use any style you prefer, the units should be miles and kilometers.

North Arrow: A North arrow is required. Use any style.

Area of Potential Effects (APE): The symbol for the project area, or APE, should be yellow fill with a brown outline. You may make the fill transparent if you wish.

0.33-mile APE buffer: The symbol for the 0.33-mile buffer should be a thick, two-toned line of dark brown and white.

Critical Habitat: Critical habitat should be gray and transparent.



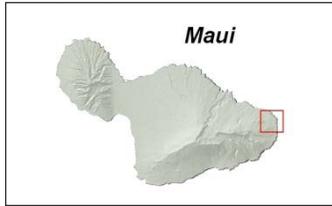
Proposed Critical Habitat: Proposed critical habitat should be gray cross-hatch.

Legend: The map must have a legend. The items should be large enough to read and the colors easily distinguishable from one another. The legend does not need to include basemap features, such as the coastline, aerial photos or topographic images. Remember to distinguish between FWS and HBMP data using different colors. Also distinguish between historical and current occurrences.

The legend items should have descriptive names. In most cases, you will need to change the default filename that appears in Toolkit when you first add a new layer to the map (e.g., [hbmp_rarespecies_p_hi00x](#)). The buffer name should include the buffer distance of 0.33 miles.

Title: The map should have a descriptive title that includes the purpose of the map as well as the client/project name, such as, "CT&E Species Map for Magoo Farms". Include the TMK or Guam/Mariana Parcel Id somewhere in the map's title.

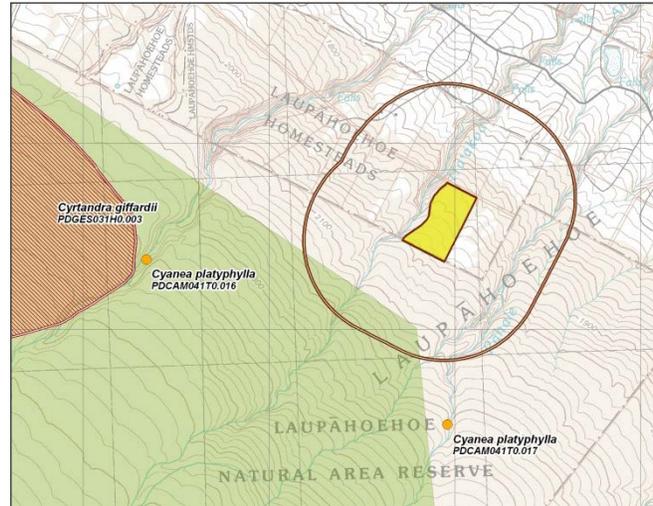
3. Additional Map Elements



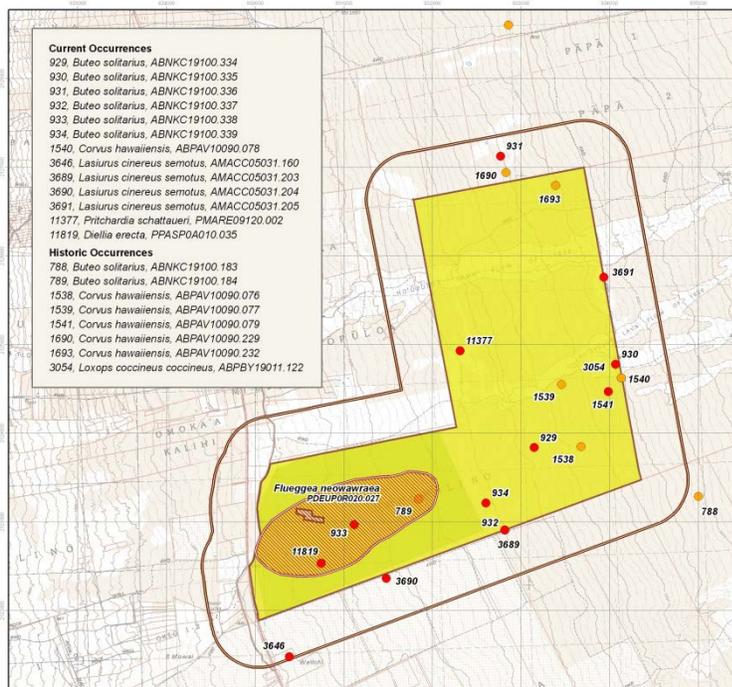
Reference Map Inset: It is useful to indicate where the project is located relative to the individual island. Although not required, a reference map with an extent rectangle identifying the project area is helpful. As an alternative, you may include a brief narrative description somewhere on the map. This narrative should include the island name and the general geographic area.

Labels: Use labels to identify all species occurrences and critical habitat units within the 0.33-mile buffer.

For projects in Hawaii, label a species occurrence with the species' scientific name and Element Occurrence Code (EOcode) as displayed in the maps on page 8. The EOcode is a unique identifier for each species occurrence record in the HBMP and FWS databases.



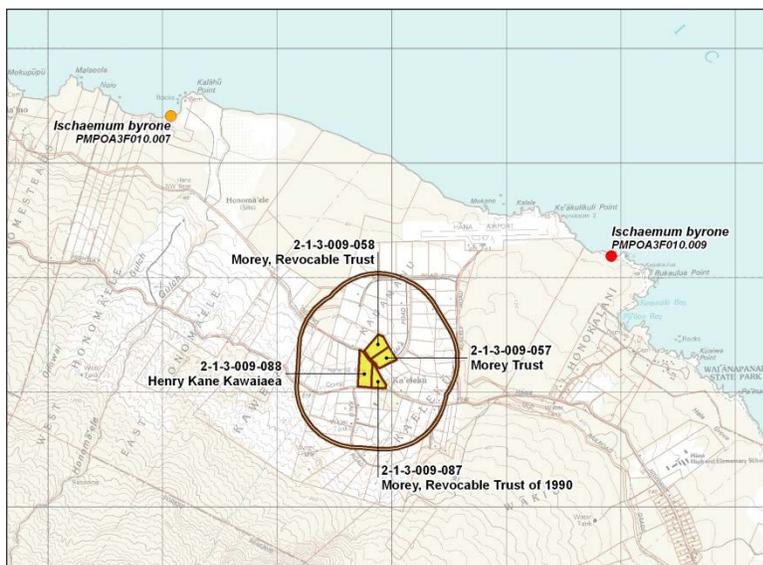
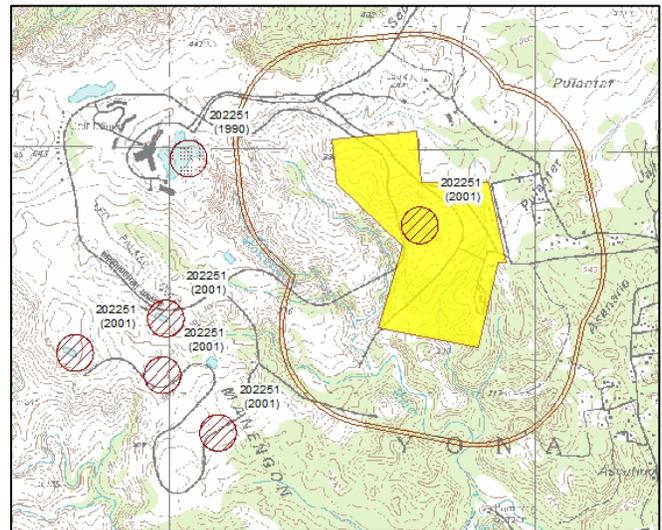
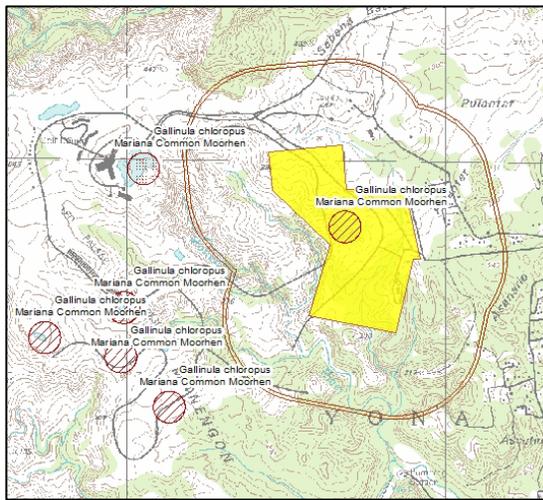
If, after adding a label you feel the map is difficult to read, you may choose to use the DotNumber instead. You should, however, include the DotNumber, scientific name and EOcode either in the legend or somewhere on the map. The map below is a sample of how this information can be displayed.



For Guam/CNMI, you should label the species occurrences with the Species name and Common name.

As with the Hawaiian Islands, if you feel the labels interfere with the readability of your map, you may choose to use the RecordId and LastObs date to label the species occurrences.

Again, you should include the scientific name, common name and Lastobs date either in the legend or somewhere on the map for reference. The two maps below are examples of how to label Guam/CNMI CT&E maps.

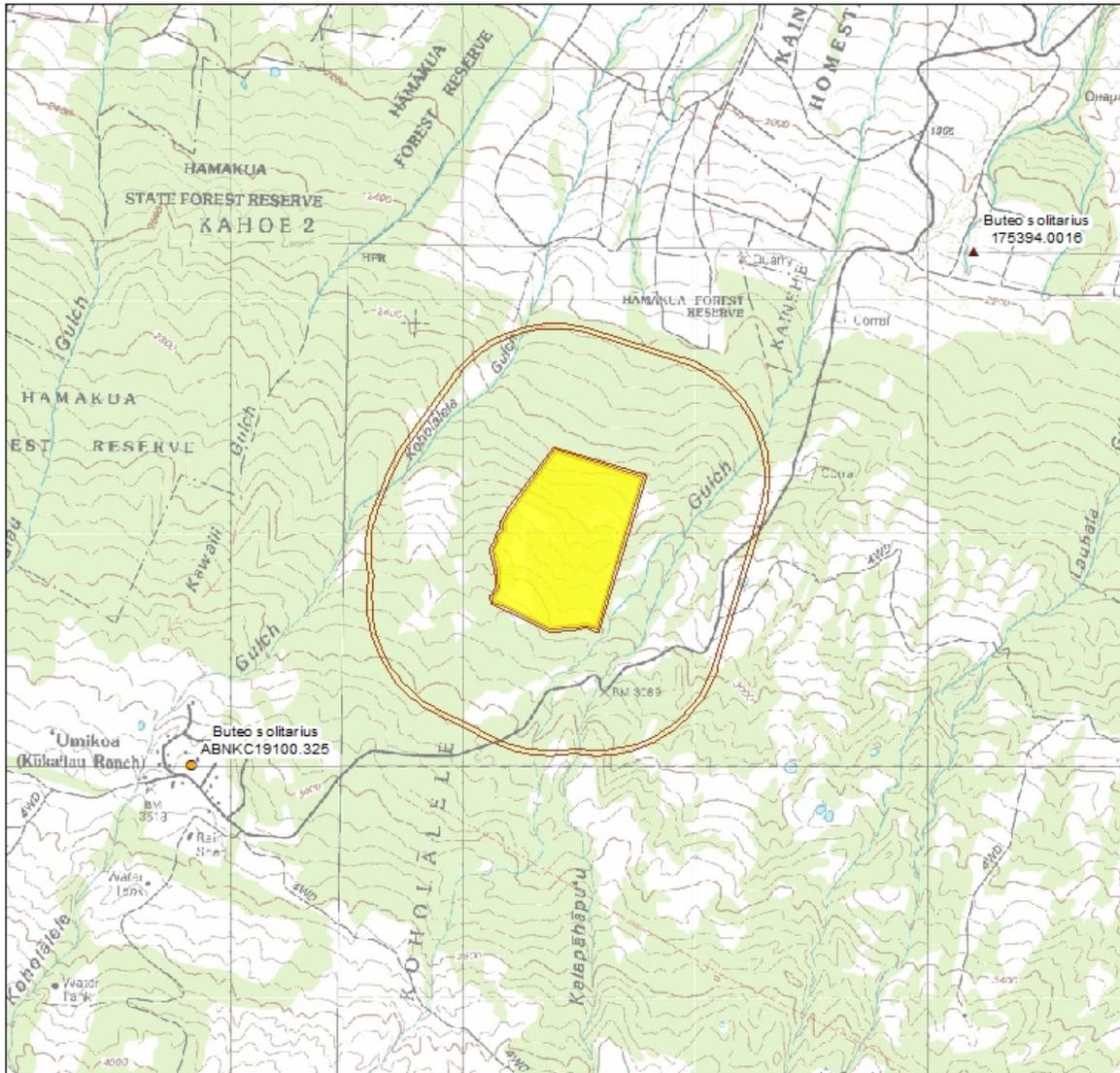


In addition to labeling the species occurrences, if the project includes more than one TMK (Hawaii) or Parcel Id (Marianas), you should label the individual parcels with the TMK or Parcel Id numbers. See example at left.

C. Exporting CT&E Map

Once you've completed your map, you can either print it from Toolkit or export it to a number of different formats. The format you choose depends on the final output. The most common formats are PDF, JPG, BMP and EMF. While all four work well, JPG, BMP and EMF are generally more interchangeable with other applications. PDF format is less interchangeable, depending on the version of Adobe Acrobat you are using. Also, if you plan to print your graphic, save it at a minimum resolution of 300 dpi. If you will be using your graphic in a PowerPoint or other screen application, you can generally save the graphic at 150 dpi to minimize the size of your file without sacrificing the quality.

Sample CT&E Species Map



C, T & E Species Map for: Hamakua Farms - TMK: 3-3-3-001-001

Date: 5/7/2014

FWS occurrences (accurate to 0.3 mile)

- ▲ Current point occurrence
- Historic point occurrence
- ▨ Current polygon occurrence

HBMP occurrences (accurate to 0.3 mile)

- ▲ Current point occurrence
- Historic point occurrence
- ▨ Current polygon occurrence
- ▤ Historic polygon occurrence

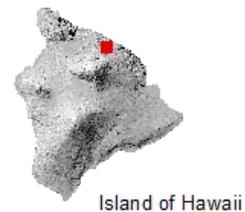
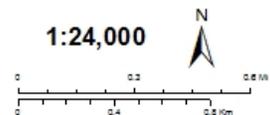
Current occurrences observed from 1994 to present

Critical Habitat

- Final Critical Habitat
- ▨ Proposed Critical Habitat

Project Location

- APE
- ▨ 0.33-mile APE buffer



PART II: THREATENED AND ENDANGERED SPECIES DATA TABLE

The CT&E Species Data Table lists all species within the 0.33-mile buffer and those that are outside the buffer but still on the map. The table should include only the following fields: EO Code or RecordID, Scientific name, Common name, Accuracy, Last observation, and U.S. Endangered Species Act (USES) designation. Additional field(s), such as DotNumber, should not be included unless it was included on your map for labeling purposes (as described above). Below is a sample of the CT&E Species Data Table:

CT&E Species Data Table						
Client Name: Joe Farmer						
Project Location (TMK): 333001001						
Date: 4/15/2014						
Sightings within project location						
FWS (Point)						
RecordID	ScName	CommonName	Accuracy	LastObs	FedStatus	Obs_Type
34647.0001	Clermontia lindseyana	Oha, oha wai	S	1	E	H
HBMP (Point)						
EOCODE	SNAME	SCOMNAME	ACCURACY	LASTOBS	USES	OBS_TYPE
ABNKC19100.362	Buteo solitarius	Hawaiian Hawk, 'Io	S	1993	LE	H
PDCAM030M0.005	Clermontia lindseyana	'Oha, 'Oha Wai	SC	1977	LE	H
FWS (Area)						
There are no federally-listed threatened or endangered species within project location.						
HBMP (Area)						
There are no federally-listed threatened or endangered species within project location.						
Critical Habitat						
Unit						
02-Phyllostegia racemosa-b						
02-Clermontia pyrularia-b						
02-Clermontia lindseyana-b						
Critical Habitat (Proposed)						
Unit						
Lowland Dry - Unit 32						
Sightings within 0.33 miles of the project location						
FWS (Point)						
RecordID	ScName	CommonName	Accuracy	LastObs	FedStatus	Obs_Type
34647.0001	Clermontia lindseyana	Oha, oha wai	S	1	E	H
34647.0012	Clermontia lindseyana	Oha, oha wai	S	1	E	H
HBMP (Point)						
EOCODE	SNAME	SCOMNAME	ACCURACY	LASTOBS	USES	OBS_TYPE
ABNKC19100.362	Buteo solitarius	Hawaiian Hawk, 'Io	S	1993	LE	H
PDCAM030M0.005	Clermontia lindseyana	'Oha, 'Oha Wai	SC	1977	LE	H
FWS (Area)						
RecordID	ScName	CommonName	Accuracy	LastObs	FedStatus	Obs_Type
505189.0211	Sesbania tomentosa	'Ohai	SC	2001	E	C

In the event you have more than one sighting, sort the table first by "Species" (in ascending order) and then by "Last observation". The "Last observation" should be sorted in descending order so multiple occurrences of the same species are presented with the most recent observations listed first.

PART III: REFERENCES

U.S. Fish & Wildlife Service Endangered Species Act Consultation Handbook

Procedures for Conducting Section 7 Consultations and Conferences, U.S. Fish and Wildlife Service and National Marine Fisheries Service, March 1998, Final.

Available online at: http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf

U.S. Fish & Wildlife Service Critical Habitat Information

NRCS-HI Biology Technical Note – No. 12

Available online at:

http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_037176.pdf

Hawaii Biodiversity & Mapping Program *(formerly Hawaii Natural Heritage Program)*

Available online at: <http://hbmp.pbrc.hawaii.edu/hbmp/>