Using GIS to Analyze the Effect of Farm Bill Programs on Threatened & Endangered Species

( and Comply with the Endangered Species Act )

Christopher Walsh
NREM 691 Final Presentation
May 3, 2005
Presentation Overview

- 2002 Farm Bill Programs
  - EQIP & WHIP
- United States Endangered Species Act
  - ESA Stats (USA & HI)
  - Section 7
- Using GIS to Create:
  - Map of Project Area
  - Section 7 Table
  - Section 7 Letter
- Conclusion & References
2002 Farm Bill Programs (NRCS)

- Wetlands Reserve Program
- Wildlife Habitat Incentives Program
- Resource Conservation and Development Program
- Grassland Reserve Program
- Farm & Ranch Lands Protection Program
- Environmental Quality Incentives Program
- Conservation Security Program
- Conservation of Private Grazing Land Program
2002 Farm Bill Programs (NRCS)

- **WHIP**: The Wildlife Habitat Incentives Program is a voluntary program that encourages creation of high quality wildlife habitats that support wildlife populations of National, State, Tribal, or local significance.

- **EQIP**: The Environmental Quality Incentives Program is a voluntary program that provides assistance to farmers and ranchers who face threats to soil, water, air, and related natural resources on their land.
Section 7(a)(2)

• Section 7(a)(2) states that each Federal agency shall, in consultation with the Secretary, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. In fulfilling these requirements, each agency is to use the best scientific and commercial data available. This section of the Act sets out the consultation process, which is further implemented by regulation (50 CFR §402).
ESA Lead Agencies

U.S. Fish & Wildlife Service (USFWS)
Terrestrial & Freshwater Habitats

National Marine Fisheries Services (NMFS)
Marine Habitats

Consultation Handbook
Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act

U.S. Fish & Wildlife Service
and National Marine Fisheries Service

March 1998
Final
The following thoughts are offered as an expression of the philosophy guiding section 7 work.

The biology comes first. Know the facts; state the case; and provide supporting documentation.

Base the determination of jeopardy/no jeopardy on a careful analysis of the best available scientific and commercial data.

Clarity and conciseness are extremely important. They make consultation documents more understandable to everyone. A biological opinion should clearly explain the proposed project, its impacts on the affected species, and the Services' recommendations. It should be written so the general public could trace the path of logic to the biological conclusion and complete enough to withstand the rigors of a legal review.
## Endangered Species In Hawaii & USA

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<tr>
<th></th>
<th>T &amp; E Species</th>
<th>T &amp; E Species with Critical Habitat</th>
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<td><strong>U.S. Total</strong></td>
<td><strong>1264</strong></td>
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<td>(U.S. Animals)</td>
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<td><strong>Hawaii Total</strong></td>
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<td>(Hawaii Plants)</td>
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<td><strong>239</strong></td>
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You Need to Consider

1. Critical Habitat
   - Critical Habitat shapefiles (proposed & final shapes)
     - Plant cluster has all plant polygons
       - Many plants: Can ID specific shape with the “Identify” tool
     - Animal shapefiles are (mostly) species-specific
       - Oahu Elepaio (Oahu)
       - Newcomb’s Snail (Kauai)
       - Blackburn’s Sphinx Moth (Multiple)
       - Cave Amphipod & Cave Wolf Spider aka “Cave Animals” (Kauai)

(Map from Lab 4)
Selected Critical Habitat Polygons

- **Critical Habitat: Molokai Plant Cluster**

- **Critical Habitat: Blackburn's Sphinx Moth** (Not including Big Island)

- **Critical Habitat: Kauai Plant Cluster**

- **Critical Habitat: Kauai Cave Animals**
You Need To Consider (cont.)

• Rare Species Sightings
  – Consult Heritage Database

• Attributes of Each Point:
  – EOCODE (Element Occurrence Code)
  – SCINAME
  – GRANK (Global Element Rank)
  – USESA (US. Endangered Species Act)
  – Accuracy (accuracy of EO as mapped)
  – YEARLASTOBS
  – QUADNAME
  – DIRECTION
Hawaii Natural Heritage Program (HINHP)

• The Heritage database and GIS is the state's most comprehensive spatial database inventory of rare, endangered and threatened, plants, animals, and ecosystems.

• HINHP is well known as a source of geospatial information and is well positioned with staff and infrastructure to continue in the building, maintenance, and dissemination of environmental datasets to the public, private, and academic sectors.
State TMKs

Find & Select TMKs of interest

Export selection as a new shapefile

Project Area Shape

Coastline map
critical habitat .shp file

topographic map .sid file

rare species Heritage Database Sightings (points)

Buffer Wizard 1.5 mile

1.5 mile radius

Buffer Wizard 5.0 mile

5.0 mile radius

Final Map
Section 7 table

Select EO Codes completely within 1.5 mile radius

Select EO Codes completely within 5 mile radius

Remove from Selection Species completely within 1.5 mile radius

Final Output
Excel Spreadsheet showing species
Within 1.5 miles:
Within 5.0 miles:

Open attribute table
Show: selected
Options: Export as .dbf

Open attribute table
Show: selected
Options: Export as .dbf

5.0 mile radius

1.5 mile radius

rare species Heritage Database Sightings (points)
### Section 7 Table

**5/2/2005**

#### Sightings within 1.5 miles of the Project Location

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Dear Mr. Newman,

The Natural Resources Conservation Service (NRCS), in cooperation with Mr. Christopher Walsh dba CW Orchids, is planning to implement a conservation plan on the island of O‘ahu TMK #4-1-024:074 under the Environmental Quality Incentives Program. The attached maps depict the project area. The project intends to eradicate Coqui frogs present on the project area by using Hawaii State Department of Agriculture approved methods. Brush and trash piles will be cleared to reduce the number of hiding places for the frogs.

The project area is an existing nursery with shadehouses. Gravel covers the ground and trees are planted around the perimeter. Based on Hawaii’s Natural Heritage Database, review of the Critical Area maps, and NRCS site inspection, there are no threatened and endangered species in the project area. Several wetland species including Hawaiian gallinule, Blackhook Hawaiian damselfly and Oceanic Megalagrion damselfly, were sighted in 1970 about 1600 feet due east from the parcel next to an irrigation reservoir. The reservoir no longer exists and the aforementioned species have not been sighted nearby since that time.

Based on the above information, NRCS has determined that the project will not likely adversely affect any threatened and endangered species. Your concurrence with this determination is requested, within 30 days, in accordance with the consultation requirements of Section 7 of the Endangered Species Act of 1973, as amended. If you have any questions, please contact the Aiea Field Office District Conservationist at (808) 483-8600.

Sincerely,

LAWRENCE T. YAMAMOTO
State Conservationist
Conclusion

• GIS makes it easy to analyze spatial information.
  – Sightings of rare species
  – Critical habitat units
  – Project location
  – Topographic features

• GIS makes it easy to comply with Section 7 of the ESA.

• GIS is a powerful conservation tool.
Acknowledgements

• Terrell Erickson
  – State Biologist, USDA-NRCS

• Patricia Shade
  – GIS Specialist, USDA-NRCS
References

- **Hawaii Natural Heritage Program**
  Univ. of Hawaii, Center for Conservation Research and Training
  3050 Maile Way, Gilmore 406
  [http://www.hinhp.org](http://www.hinhp.org)

  available online at: [http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm](http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm)

- **2002 Farm Bill Programs**

- **Critical Habitat Designation** – Kauai Cave Wolf Spider and Kauai Cave Amphipod: 50 CFR Part 17 / Vol. 68, No. 68 / Wednesday, April 9, 2003 / Rules and Regulations