

APPLICATIONS

Applications of SWReGAP Data to Conservation

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Introduction

The Southwestern Regional Gap Analysis Project (SWReGAP) provides regional data sets for Arizona, Colorado, New Mexico, Nevada, and Utah, an area that approximates nearly one-fifth of the conterminous United States. These data sets allow for ecoregional analysis of biotic elements and current conservation status. SWReGAP data sets include a 125 class land cover map, 819 terrestrial species habitat models (37 amphibians, 130 reptiles, 437 birds, and 215 mammals), a seamless regional stewardship data set, and gap analysis statistics by state and region (Prior-Magee et al. 2007). SWReGAP was a cooperative effort involving many state and federal natural resource agencies, conservation organizations, tribal resource programs, and universities.

These data can play an informative role in the conservation strategies recently identified in state Wildlife Action Plans (SWAPs) or Comprehensive Wildlife Conservation Strategies (Arizona Game and Fish Department 2005a, 2005b; Colorado Division of Wildlife 2005; Nevada Department of Wildlife 2005; New Mexico Department of Game and Fish 2005, Utah Division of Wildlife Resources 2005). SWAPs provide state and Federal agencies a blueprint for conservation. Incorporation of SWReGAP into these strategies will be mutually beneficial to all involved.

For the past two years New Mexico Cooperative Fish and Wildlife Research Unit provided outreach and expertise in applying SWReGAP data to state, federal, and local cooperators. We worked closely with existing cooperators to provide workshops, expertise, and coordination in using SWReGAP data in conservation applications. We focused on three objectives: (1) conducting workshops for partners; (2) working with partners to incorporate SWReGAP data; and (3) identifying future collaborative projects.

Workshops

We created a workshop focusing on the products and applications of SWReGAP (available at <http://swgap.nmsu.edu/SWGAPWorkshops/>). Workshops provided participants with background, methods, results, data acquisition, and an opportunity for hands-on use of the data, and were designed around Gap Analysis objectives. State wildlife agencies were targeted including Arizona Game and Fish Department (AGFD), Colorado Division of Wildlife (CDOW), Nevada Department of Wildlife (NDOW), New Mexico Department of Game and Fish (NMDGF), and Utah Division of Wildlife Resources (UDWR). The focus was on identifying potential future collaborative efforts. The 72 participants included bureau and assistant chiefs, recovery coordinators, habitat specialists, biologists, GIS coordinators and specialists, natural heritage coordinators, Wildlife Action Plan coordinators, program managers, conservation stewardship coordinators, and planners. Workshops discussions centered on SWAPs and applying gap data to new applications. Lists of potential applications of SWReGAP data to each wildlife agencies were generated. Focus was on current or planned projects that could be enhanced with SWReGAP data.

Identified projects included methods to identify areas of conservation concern, high priority habitat, conservation focus, and species habitat within these areas (AGFD 2005a, CDOW 2005, NMDGF 2005, UDWR 2005). Other needs included using data to inform Habitat Stamp Programs, land acquisition and property evaluations (CDOW 2005, NMDGF 2005). Agencies also are interested in using this and other data to evaluate oil and gas leases and regulations (CDOW 2005, NMDGF 2005). Data also can be used for species evaluation, monitoring, recovery plans, and potential reintroduction areas (CDOW 2005, NMDGF 2005, UDWR 2005). Projects

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focusing on more technical aspects included creating a generalized vector land cover data set for an existing tool (AGFD 2005b) and providing data sets for use under limited software and hardware resources (NMDGF 2005). A need also exists to compare SWReGAP data sets to other currently used data sets (AGFD 2005a, CDOW 2005). Other suggestions included additional habitat modeling of subspecies and species not modeled by SWReGAP, and collaborating on modifying and assessing models (NDOW 2005, UDWR 2005).

Federal agencies, including Region 2 U.S. Fish and Wildlife Service (USFWS), also expressed interest in SWReGAP data. SWReGAP data provides baseline information for the nationwide strategic habitat conservation planning effort (National Ecological Assessment Team 2006). Other projects discussed included identifying CRP lands, shinnery oak, sandsage, mesquite, and creosote bush communities for restoration, and using models (e.g. yellow-billed cuckoo) to identify habitat quality and quantity necessary for stable populations.

Workshop participants identified barriers to using gap analysis data. A strategic plan for the Gap Analysis Program with a conceptual timeframe when data sets will be updated was suggested. State agencies expressed concern that analyses and data sets are a snapshot in time with no specific time lines and strategies for future iterations or modifications. There is significant interest in having assistance in using and modifying the data for specific agency purposes. Cooperators were interested in the time lines for the adjacent regional projects including the Northwest, California, Texas, Oklahoma, Kansas, and Nebraska, especially with respect to edgematching. Cooperators were also interested in Aquatic GAP and its products.

Land cover, stewardship, and individual species habitat model data sets are the most frequently used SWReGAP data sets, largely because of ease of use. Agencies expressed interest in the gap analysis statistics but currently do not use analyses. Agencies were interested in modifying the underlying data sets based on either state knowledge or new information. Agency personnel, software, and hardware limit the ability to use data. Web-based applications such as the Gap Ecosystem Data Explorer (GEDE) tool will provide avenues to overcome this barrier.

Applications

Scaling SWReGAP data down for county level application was conducted in an Environmental Protection Agency funded project that addressed the Clark County, NV Multispecies Habitat Conservation Plan (MSHCP)(Clark County Department of Comprehensive Planning 2000; Hiatt and Boone 2003). We revised 37 species habitat models specific to the Mojave Desert Ecoregion (Boykin et al. 2008). Species model modifications varied with corresponding changes in suitable habitat dependent on species. A higher percentage of habitat for these 37 species is in Status 1 and 2 lands within the study area than within the rest of Nevada or the SWReGAP region. We applied the gap analysis approach to a MSHCP management data set to provide better context. We evaluated whether inductive habitat modeling approaches for four species provided better suitable habitat representation. Results varied based on number of species occurrence points, distribution of points, and adequate input data sets (Boykin et al. 2008). Results do suggest that further analysis of this method is warranted.

We are currently working with NDOW on an inductive habitat model for the entire range of the Gila Monster (*Heloderma suspectum*) using Maximum Entropy (Phillips et al. 2006). The species was prioritized as a regional species of concern by the Southwest Partners in Amphibian and Reptile Conservation (SWPARC) and within SWAPS (AGFD 2005b, NDOW 2005, NMDGF 2005, UDWR 2005).

We are currently applying SWReGAP data to several other projects including incorporating SWReGAP data into the NMDGF web-deployed SWAP database. We also assisted in completing a spatial data request from the Western Governors' Association by providing a New Mexico Species of Greatest Conservation Need (SGCN) species richness data set. NMDGF is incorporating SWReGAP data into their online species database (Biota Information System of New Mexico–BISON-M; <<http://bison-m.org/>>). Data have been used in several county and state agency conservation plans including Bernalillo County, NM, and Pima County, AZ.

Regional Research

We are in the process of comparing “gap species” and SGCN and creating a regional conservation focal area data set. The comparison between “gap species” and SGCN is focused on concordance and discordance between these two lists. This analysis will identify species that should be reviewed for Wildlife Action Plan updates. The conservation focal area analysis uses data sets of identified key habitats, ranking of factors that affect those habitats, SGCN richness, and gap management status to identify areas of potential conservation focus within the entire region (see NMDGF 2005).

Conclusions

State wildlife agencies in the SWReGAP study area were given full day workshops. There is a high level of interest in using these data sets and we identified a need for assistance in application. Application of data sets will be influenced by agency needs and limitations, direction of state wildlife action plans, and developing partnerships with state and Federal agencies (e.g. USFWS). Potential limitations for using SWReGAP data range from operational (hardware and software) to technical (limited GIS capabilities) to philosophical (finer scale focus). Hardware, software, and personnel capabilities vary considerably between potential end users and many personnel work at a finer resolution than SWReGAP data is intended to be used.

SWAPs are obvious connections between SWReGAP and state agencies. Unfortunately SWAPs were completed at the same time as SWReGAP. Three states used SWReGAP land cover (Colorado, Nevada, New Mexico) and two states used stewardship, and habitat models (Colorado, New Mexico). Two states (Arizona and Utah) did not use SWReGAP data within their SWAP. States acknowledged the need to incorporate data sets such as SWReGAP. Regionalization of state SWAPs is necessary and SWReGAP data provides a consistent baseline data set. Other efforts (e.g. SWPARC) are also in search of a regional framework to organize conservation efforts.

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