Inside the Program

GAP is administered through the U.S. Geological Survey's (USGS) Core Science Systems. GAP is highlighted in the Department of Interior's Strategic Plan for 2011-2016 as a key component in the department's goal to develop a comprehensive science framework for understanding the Earth. To further that goal, GAP provides scientific data to the public via easily accessible online web mapping applications.

Data Availability

All final GAP maps and data are accessible at: <http://gapanalysis.usgs.gov.> Maps and data can be explored via online mapping applications at <http://gapanalysis.usgs.gov/viewers/.>

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USGS science for a changing world

GAP

Gap Analysis Program

Keeping Common Species Common

U.S. Department of the Interior
U.S. Geological Survey, Core Science Systems

gapanalysis.usgs.gov

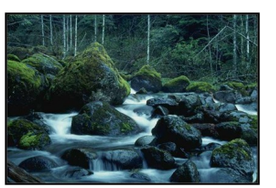
The Mission

The mission of the Gap Analysis Program (GAP) is to promote conservation by providing broad geographic information on biological diversity to resource managers, planners and policy makers who can use the data to make informed decisions.

We are focused on serving and maintaining national land cover, protected areas and species distribution maps and data. Our data and analytical tools have been used in hundreds of applications: from basic research, to comprehensive state wildlife plans; from education projects in schools to national assessments of biodiversity. We have established a collaborative network of 500 cooperating state and federal agencies, academic and non-profit institutions, tribes and businesses. Through this collaboration, we have developed a suite of data that is crucial to address conservation issues on a broad scale.

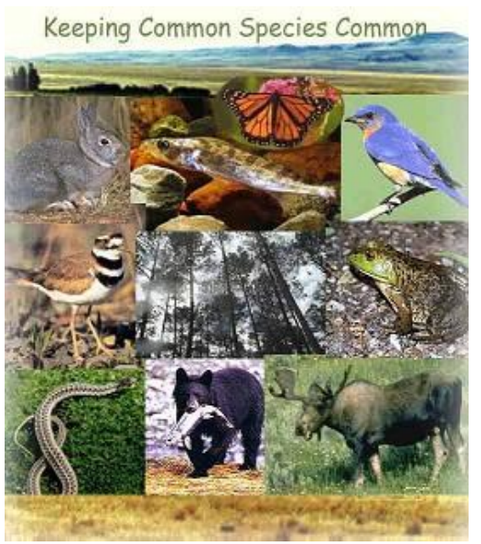
The Context

Despite widespread public support for conservation and environmental protection, many species that once were common are now at risk. Loss of habitat, incursions by invasive species, and impacts of climate change are major factors contributing to the decline of biological diversity in the US. As native habitats are altered, fragmented, or eliminated, native species decline. In general, the greater the decline, the more difficult and expensive the recovery.

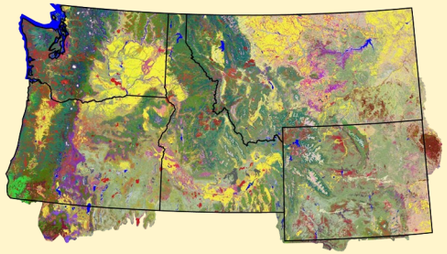


The Challenge

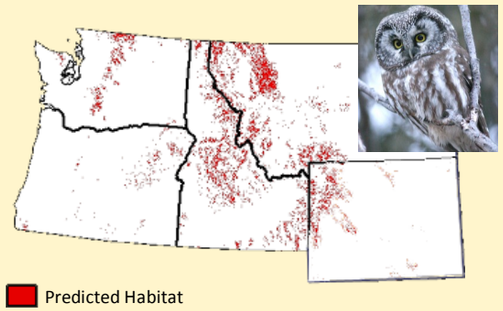
Keeping common species common means protecting them before they become threatened. Protection on a large-scale basis requires key information such as land cover descriptions (i.e. vegetation communities), predicted distribution maps for native animals and an inventory of our current protected areas network. Together this information provides an assessment of the level of protection currently given to existing vegetation communities and animals.



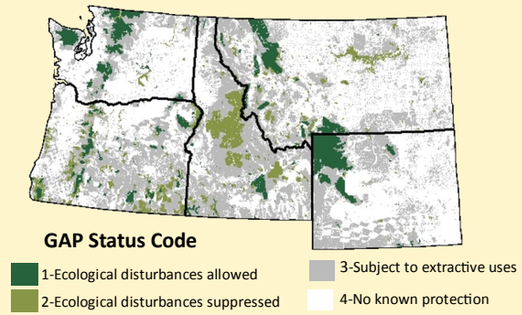
We work cooperatively with federal, state, and local natural resource agencies and universities to provide this information. Our national databases and maps can be used to identify "gaps" in conservation, places where an animal or vegetation community is not adequately represented within our existing network of protected areas. By working to identify and eliminate these gaps, we can work to keep common species common.



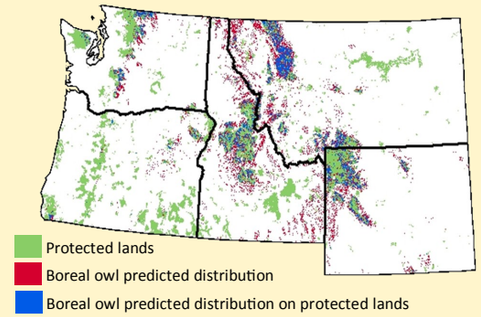
Map 1. Land Cover of the Northwest



Map 2. Draft Predicted Boreal Owl Distribution



Map 3. Protected Lands Map of the Northwest



Map 4. Draft Gap Analysis Results for Boreal Owl

Gap Analysis

The gap analysis process is straightforward. For a given area, (e.g. the Northwest) researchers create spatial data in a GIS, for vegetation communities, land cover descriptions, and protected areas. GAP data are scalable. Analyses can be done on a state, regional or national level.

First, land cover descriptions, representing the vegetation communities of the area are created (Map 1). **Second**, predicted distribution maps of vertebrate species native to the area are created (Map 2). **Third**, a protected areas map is created to show which land parcels are managed for conservation. Each parcel is given a GAP Status Code:

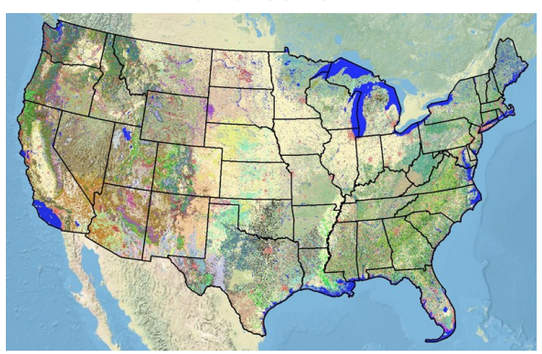
- Managed for Biodiversity
  - 1 - Ecological disturbances allowed
  - 2 - Ecological disturbances suppressed
- Managed for Multiple Uses
  - 3 - Subject to extractive uses
  - 4 - No known protection.

With these spatial data and maps, researchers conduct a gap analysis to examine patterns of biodiversity and identify species and vegetative communities that need further protection. The result of a gap analysis for the boreal owl (*Aegolius funereus*), a species native to the Northwestern US, is shown above (Map 4).

Land Cover

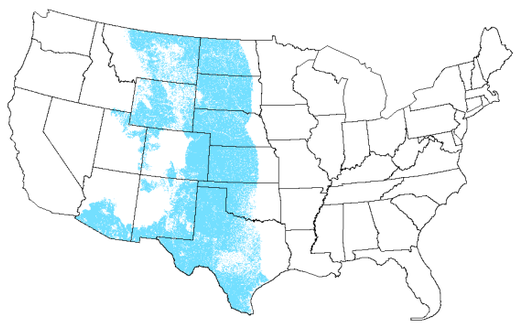
GAP's national land cover database describes the natural vegetation and land use patterns for the entire US and Puerto Rico. There are 551 Ecological Systems (i.e. recurring groups of biological communities found in similar physical environments) and 39 land use classes, which depict developed and disturbed land cover types. Land cover information is a key component of effective biodiversity protection.

Land Cover



Species Distributions

Lark Bunting (*Calamospiza melanocorys*)



Vertebrate Species

GAP is developing national species distribution models for more than 2,000 amphibian, bird, reptile and mammal species in the United States. These species models will include the entire area in which a species is known to occur and will not be limited by state boundaries. These species distribution models will enable GAP to conduct a national biodiversity assessment. They will also provide essential data for pro-actively planning for species and habitat conservation efforts.

Protected Areas Database of the United States (PAD-US)

PAD-US compiles public and voluntarily provided privately protected areas for the entire US and Puerto Rico. The lands included in PAD-US are assigned conservation measures that denote the level of biodiversity protection and indicate other natural, recreational and cultural uses. Protected area boundaries are presented in context with surrounding land owners (e.g. USFS, BLM, etc.) with parcel information (e.g. name, state, area, etc.) to support biodiversity protection and landscape planning.

Protected Areas