

PREPARED FOR THE CITIZENS OF COLORADO AND ITS VISITORS  
BY COLORADO PARKS AND WILDLIFE

# State Wildlife Action Plan Executive Summary



A STRATEGY FOR CONSERVING WILDLIFE IN COLORADO



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# Overview

Colorado Parks and Wildlife (CPW) is pleased to present the Executive Summary of the comprehensive revision of the State Wildlife Action Plan (SWAP). The full SWAP is available for download from the CPW website: [www.cpw.state.co.us](http://www.cpw.state.co.us).

Colorado's SWAP documents the status of knowledge about many wildlife species of conservation need, most of which are not hunted or fished, the threats to the species and habitats upon which they depend, and an articulation of strategies that can be employed to lessen those threats. It is based upon the best science available at this time, the collective judgment of many of Colorado's scientists, and also reflects the interests and concerns of citizens with a stake in Colorado wildlife conservation. It reflects the fundamental goal of CPW and the state as a whole, which is to secure wildlife populations such that they do not require protection via federal or state listing regulations. Further, it fulfills the requirements of the State Wildlife Grants program (Title IX, Public Law 106-553 and Title 1, Public Law 107-63) by addressing the eight elements stipulated in that legislation.

This is not a CPW specific plan, and instead is intended to be used by all interested in conserving aspects of Colorado's natural heritage.

Within the SWAP, a prioritized Tier 1 Species of Greatest Conservation Need has been identified. Detailed narratives describing condition, threats and conservation actions for both Tier 1 species and habitats is enhanced in this revision. Assessments of plants and a vulnerability assessment of habitats due to climate change are new to this version of the plan; neither of these components were part of the original document.

The process of revising the 2006 SWAP was undertaken with the intent of making the plan more strategic, precise and useful. These objectives have been met. A broad spectrum of stakeholders representing the scope of Colorado's conservation partners were engaged through this process – federal, state, and municipal agencies, non-governmental organizations (NGOs), academic institutions, tribe members and members of the general public to arrive at the final document.

Overall, a blueprint for conservation for CPW as well as numerous conservation partners has been created. CPW will rely on this plan for strategic decision making and it is anticipated that others will do so as well as we follow this road map for collaborative conservation.

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# Element 1: Species of Greatest Conservation Need

Colorado's first SWAP, completed in 2006, identified 210 Species of Greatest Conservation Need (SGCN). Those species were grouped into Tier 1 (107 species) and Tier 2 (103 species) categories, reflecting a relative degree of conservation priority. Conservation attention is still warranted for the species on the original SGCN list. However, the utility of such a long Tier 1 species list for prioritizing conservation work over the intervening years has been somewhat confounding. Thus, a primary focus of the SGCN component in this SWAP revision has been to improve the SWAP's usefulness for conservation prioritization, while continuing to recognize the broader interests and capacity of Colorado's conservation community overall. To that end, the criteria used to characterize Tier 1 and Tier 2 SGCN have been redefined.

Also, in the interest of improving the SWAP's applicability across Colorado's conservation community, a rare plant component has been added to the plan, and the insect component of the SGCN list has been retained and expanded. Though CPW does not have statutory authority over plant and insect species, the crucial role these taxa play in the ecosystems and wildlife communities of the State is recognized. Because the SWAP is a plan for all of Colorado, not just for CPW, SWAP elements for plants and non-mollusk invertebrates are included in Appendices A and B of the full Colorado SWAP.

The 2015 SGCN list of vertebrate animals and mollusks contains 159 species. Fifty-five species have been identified as Tier 1 SGCN, including 2 amphibians, 13 birds, 25 fish, 13 mammals, and 2 reptiles. The revised Tier 2 SGCN list of vertebrate animals contains 104 species, including 8 amphibians, 48 birds, 2 fish, 23 mammals, 14 reptiles, and 9 mollusks. The Plants of Greatest Conservation Need (PGCN) contains 117 species; of these, 43 are Tier 1 and 74 are Tier 2. The revised Tier 2 SGCN invertebrate list contains 76 species, including 1 arachnid, 2 beetles, 6 bumble bees, 27 butterflies, skippers, and moths, 3 caddisflies, 16 damselflies and dragonflies, 15 mayflies, 1 mydas fly, and 4 stoneflies. Tier 1 vertebrate SGCN are listed in Table ES 1 below. Refer to the full SWAP for Tier 2 SGCN and all PGCN.



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**Table ES 1. Tier 1 Species of Greatest Conservation Need**

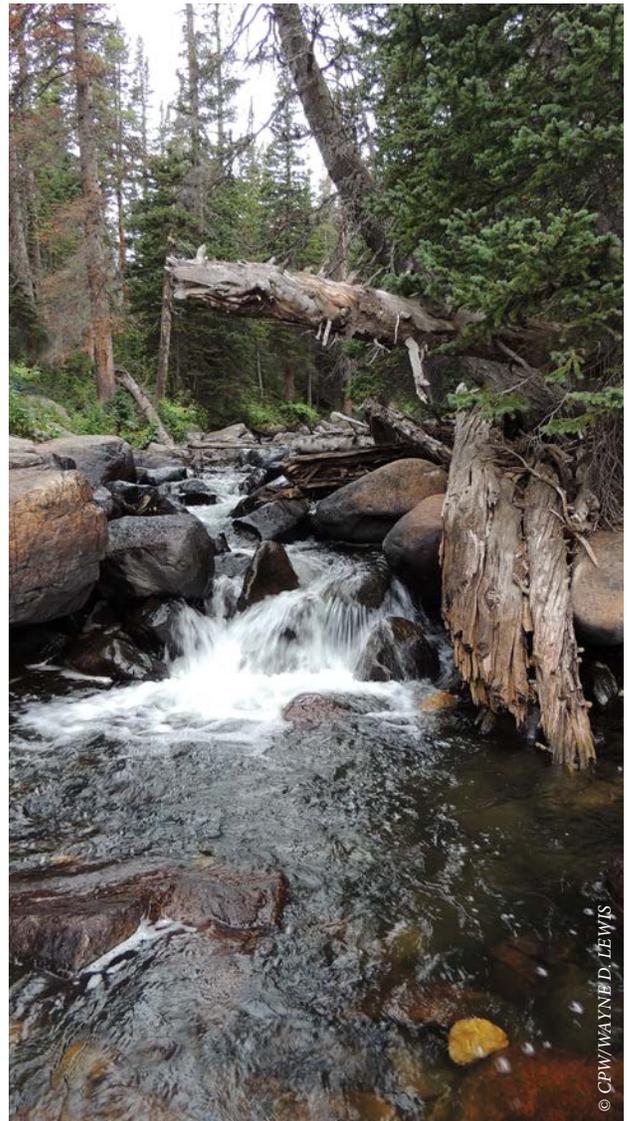
AMPHIBIANS	MAMMALS	FISH	
Boreal toad (Southern Rocky Mountain population)	American pika	Arkansas darter	
Northern leopard frog	Black-footed ferret	Bluehead sucker	
	Fringed myotis	Bonytail chub	
	Gunnison's prairie dog	Brassy minnow	
	Little brown myotis	Colorado pikeminnow	
	Lynx	Colorado River cutthroat trout	
	New Mexico meadow jumping mouse	Common shiner	
	Olive-backed pocket mouse	Flannelmouth sucker	
	Preble's meadow jumping mouse	Flathead chub	
	Spotted bat	Greenback cutthroat trout	
	Townsend's big-eared bat	Humpback chub	
	White-tailed prairie dog	Mountain sucker	
<b>BIRDS</b>	Wolverine	Northern redbelly dace	
Brown-capped rosy-finch	<b>REPTILES</b>	Orangespotted sunfish	
Burrowing owl		Orangethroat darter	
Columbian sharp-tailed grouse	Colorado checkered whiptail	Plains minnow	
Golden eagle	Massasauga	Plains topminnow	
Greater sage-grouse		Razorback sucker	
Greater sandhill crane		Rio Grande chub	
Gunnison sage-grouse		Rio Grande cutthroat trout	
Lesser prairie-chicken		Rio Grande sucker	
Mountain plover		Roundtail chub	
Plains sharp-tailed grouse		Southern redbelly dace	
Southern white-tailed ptarmigan		Stonecat	
Southwestern willow flycatcher		Suckermouth minnow	
Western yellow-billed cuckoo			

## Element 2: Habitats

The habitat component of Colorado’s 2006 SWAP considered 41 land cover types from the Colorado GAP Analysis. Since then, the Southwest Regional GAP project (SWReGAP) has produced updated land cover mapping using the U.S. National Vegetation Classification (NVC) names for terrestrial ecological systems.

Fifty-seven terrestrial land cover types mapped for SWReGAP have been categorized into 20 habitat types, and an additional nine aquatic habitats and seven “Other” habitat categories have been defined. SWAP habitat categories are listed in Table ES 2; see Appendix C in the full Colorado SWAP for the crosswalk of SWAP habitats with SWReGAP mapping units.

A map of key habitats of Colorado is on the inside back cover of this Executive Summary (Figure ES 7).





**Table ES 2. Habitats in Colorado**

Table ES 2. Habitats in Colorado		
FORESTS	GRASSLANDS	WETLAND AND RIPARIAN
Aspen	Foothill and Mountain Grasslands	Playas
Lodgepole Pine	Mixed and Tallgrass Prairies	Riparian Woodlands and Shrublands
Mixed Conifer	Shortgrass Prairie	Wetlands
Pinyon - Juniper		
Ponderosa Pine	SHRUBLANDS	
Spruce - Fir	Desert Shrub	
Subalpine Limber - Bristlecone Pine	Greasewood	
	Oak and Mixed Mountain Shrublands	
	Sagebrush	
	Saltbush	
	Sandsage	
	Upland Shrub	
OTHER HABITATS		AQUATIC
Agriculture		Colorado Plateau - Wyoming Basins Rivers
Alpine		Colorado Plateau - Wyoming Basins Streams
Cliffs and Canyons		Eastern Plains Rivers
Conservation Reserve Program		Eastern Plains Streams
Hot Springs		Lakes
Reservoirs and Shorelines		Mountain Streams
Sand Dunes		Rio Grande Valley Rivers
		Rio Grande Valley Streams
		Transition Zone Streams

## Elements 3 & 4: Threats and Conservation Actions

A standardized lexicon to describe threats and conservation actions has been developed by the Conservation Measures Partnership<sup>1</sup> (Salafsky et al. 2008<sup>2</sup>), and is recommended in the 2012 Best Practices for State Wildlife Action Plans guidance. For the 2015 SWAP, the CMP lexicon's classification of general threats and conservation actions has been adopted. The database that was developed to house information on SGCN and habitats for the 2006 SWAP has been updated to reflect the new lexicon.

Current information on problems that may adversely affect SGCN or their habitats (i.e., "threats") was compiled from a number of different sources, including the 2006 SWAP, agency and partner biologists, and a variety of existing conservation assessments, conservation and management plans, CPW and Colorado National Heritage Program (CNHP) databases, and published literature. There are myriad existing resources that present in-depth discussions of threats and/or needed conservation actions for many of the SGCN and their habitats. The purpose of the SWAP is not to re-create these resources, but rather to summarize the most crucial aspects of biodiversity conservation in Colorado over the next 10 years.

This threat assessment was undertaken strictly from the perspective of wildlife conservation. Some of the identified practices are also necessary

and highly valued public services and land uses – for instance, water development, residential development, recreation, mining, and agriculture. These activities provide important values and are legitimate, often vital public pursuits, from which all of society benefits. Nonetheless, aspects of some of these activities are sometimes harmful to wildlife and their habitats, which are also legitimate public values and resources; therefore, these actions pose challenges from the viewpoint of wildlife conservation. These challenges need to be identified in order to determine which are most harmful, and importantly, where opportunities for investments in remedial or preventive actions would be most effective and efficient.

### **Threats and Conservation Actions for SGCN**

Overall, lack of knowledge and natural systems modifications (including alteration of natural hydrological and fire regimes) are issues for the greatest number of Colorado's 159 vertebrate animal and mollusk SGCN (Figure ES 1). Lack of knowledge is a factor for over half of these SGCN – this is especially true for Tier 2 species. Impacts from non-native or problematic native species (including pathogens), habitat conversion (cropland, urban development), and incompatible agricultural practices are also significant for many SGCN. Of the 55 Tier 1 SGCN, more than half are affected

<sup>1</sup>The Conservation Measures Partnership (CMP) is a joint venture of conservation organizations and collaborators that are committed to improving the practice of conservation. Each organization within CMP has biodiversity conservation as its primary goal, has a focus on field-based conservation actions, and is working to develop better approaches to project design, management, and assessment. For additional information, visit <http://www.conservationmeasures.org/>.

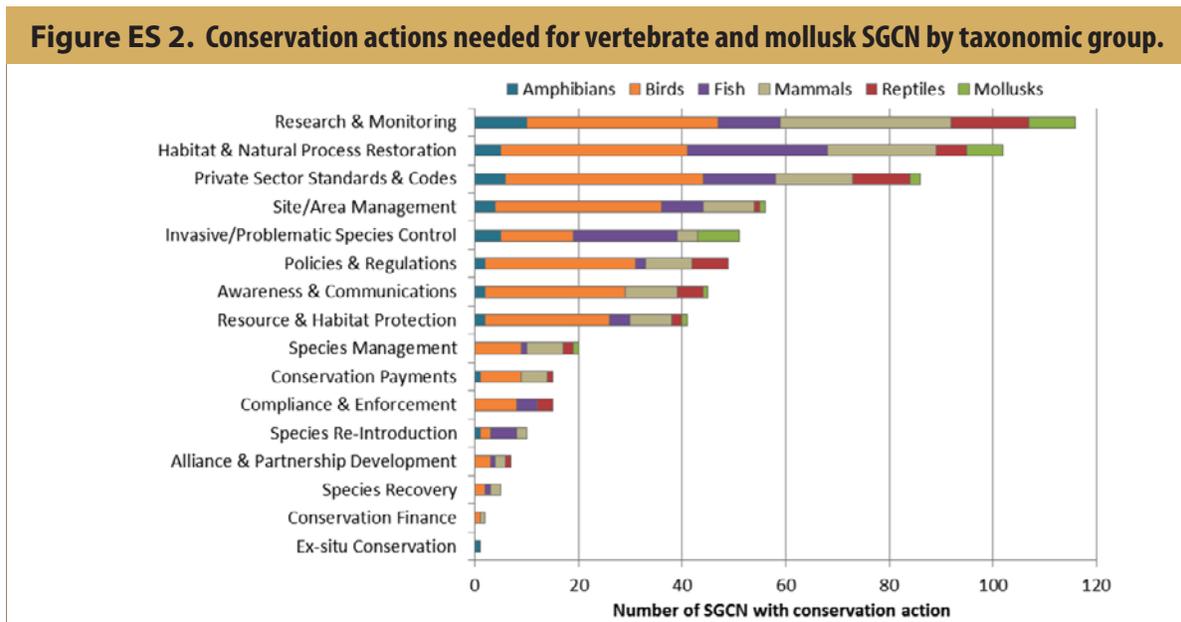
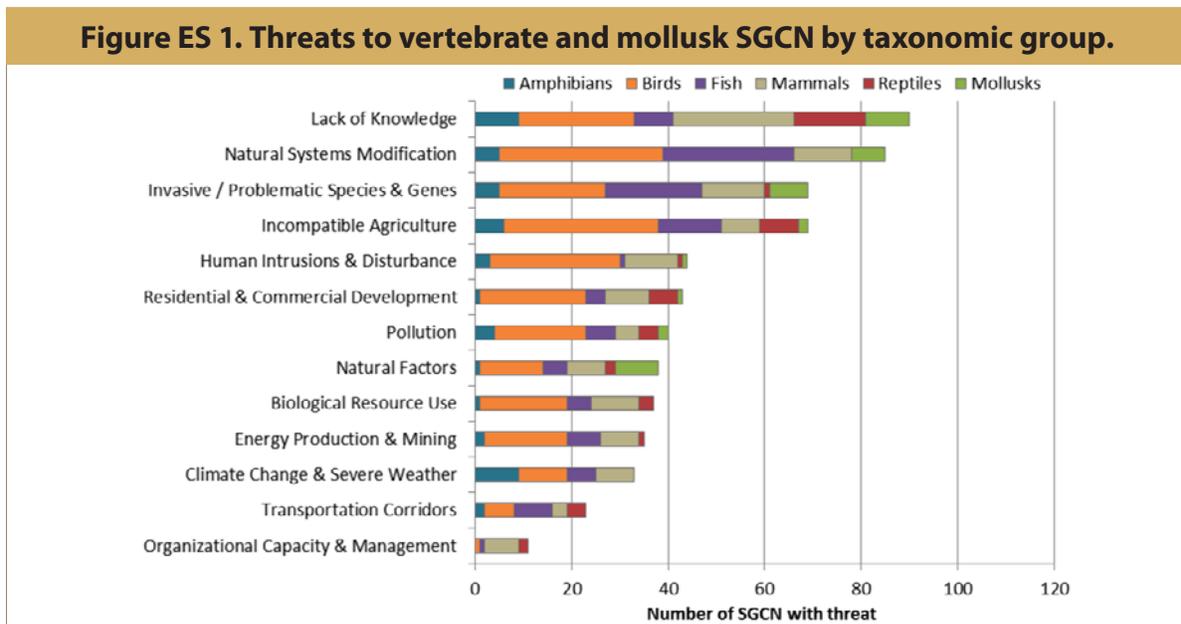
<sup>2</sup>Salafsky, N., D. Salzer, A.J. Stattersfield, C. Hilton-Taylor, R. Neugarten, S.H.M. Butchart, B. Collen, N. Cox, L.L. Master, S. O'Connor, and D. Wilkie. 2008. A standard lexicon for biodiversity conservation: unified classifications of threats and actions. *Conservation Biology* 22:897-911.

by these threats. The highest priority conservation actions for SGCN include research/monitoring and management or restoration of habitats and ecological processes (Figure ES 2). For Tier 1 SGCN, restoration is the most needed conservation action, especially for aquatic species.

Private enterprise also has a crucial role to play through application of standards such as Best Management Practices.

Land and resource protection (conservation easements, water rights), control of invasive species, and application of policy and regulation

are all important as well. Conservation of Colorado’s wildlife is too big a task for one agency. Accomplishing the actions identified in this plan will require developing many new partnerships, as well as continuing to capitalize on existing partnerships. Creation, testing, and implementation of market-based conservation tools are ongoing – greater emphasis on these approaches is also needed. While research and monitoring won’t achieve conservation in and of itself, conducting research to understand the limiting factors SGCN face is necessary to accurately identify and prioritize specific management/conservation actions needed.



## Threats and Conservation Actions for Habitats

Of 36<sup>3</sup> terrestrial and aquatic habitats, almost all are affected by residential/commercial development and natural systems modifications (including alteration of hydrological and fire regimes) (Figure ES 3). Conversion or degradation from incompatible agricultural activities, climate change, and invasive species are affecting more than two-thirds of Colorado’s habitat types. All of seven forest types are impacted by climate change, natural systems modifications, and invasive species. Of seven shrubland types, all are impacted by residential/commercial development and incompatible agricultural practices. All three grassland types and all three riparian/wetland types are affected by residential/commercial development, incompatible agricultural practices, natural system modifications, invasives, and climate change. Not surprisingly, the most significant issues for aquatic habitats are urbanization and natural system modification, specifically dams and water management/use.

As part of the SWAP revision process, a habitat-based climate change vulnerability assessment was conducted, the results of which are summarized in Appendix F of the full Colorado SWAP. The full technical report can be obtained from CNHP or accessed online<sup>4</sup>. Climate projections for Colorado are generally in agreement that the state that the state will experience temperature increases between 2-5 °F by mid-century. Projections for future precipitation are variable, ranging from very dry to approximately 10% wetter than current conditions. How climate change will ultimately manifest in Colorado, as well as potential impacts to wildlife species and habitats, is largely unknown at this point (Table ES 3).

Habitats are most in need of management and restoration (Figure ES 4). All forest, shrubland, grassland, riparian, and wetland habitats, and almost all aquatic habitats, are in need of restoration of specific habitat components and/or ecological processes. Some land uses, such as grazing and logging, can be used as management tools to help restore the species composition and structure of habitats, as well as to mimic disturbance regimes (fires and floods, for example) that are needed to maintain certain habitat types. Land and resource protection and management, and research are also significant needs, as are control of non-natives and implementation of compatible practices by private enterprise. Development and implementation of Best Management Practices for energy, agriculture, transportation, urban development, forestry, and water management industries could make significant contributions to improving habitat health.

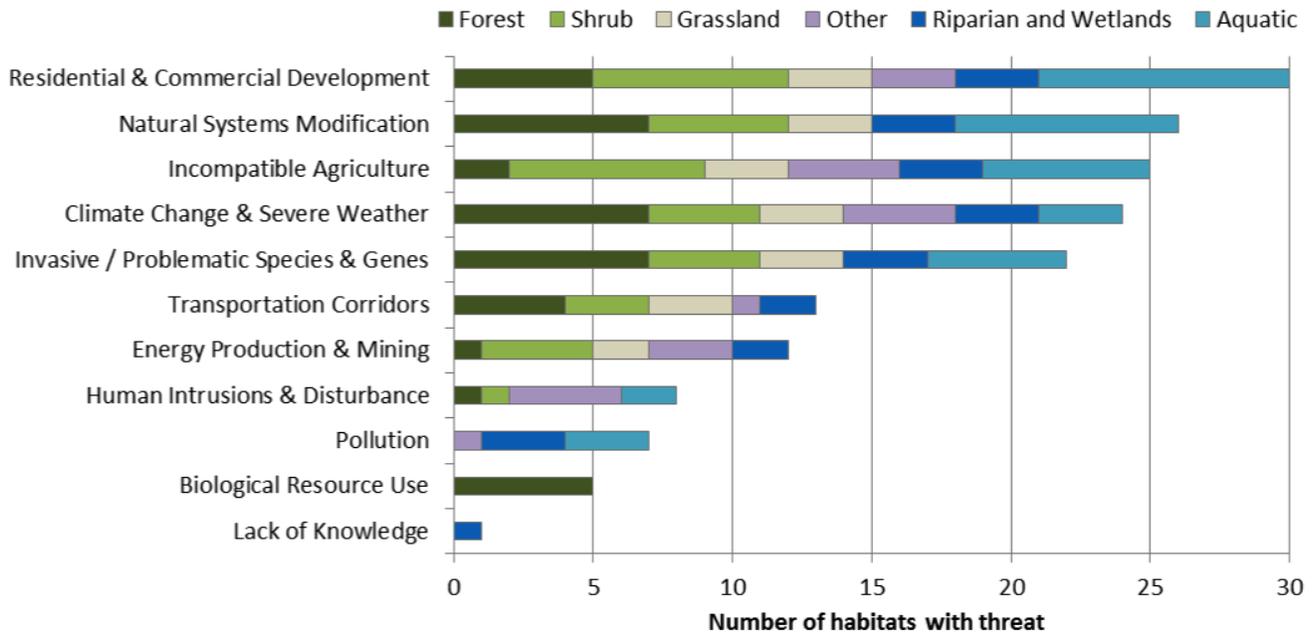
**Table ES 3. Relative vulnerability of habitat types to modeled climate change**

Oak & mixed mountain shrub	Low
Sagebrush shrubland	
Riparian woodland & shrubland - mountains	
Riparian woodland & shrubland - low elevation east	
Wetlands - low elevation west	
Wetlands - mountains	
Alpine	Moderate
Foothill & mountain grassland - high elevation	
Lodgepole pine forest	
Pinyon-Juniper woodland	
Ponderosa pine forest	
Sandsage shrubland	
Spruce-Fir forest	
Riparian woodland & shrubland - low elevation west	
Wetlands - low elevation east	
Foothill & mountain grassland - low elevation	High
Playas	
Shortgrass prairie	

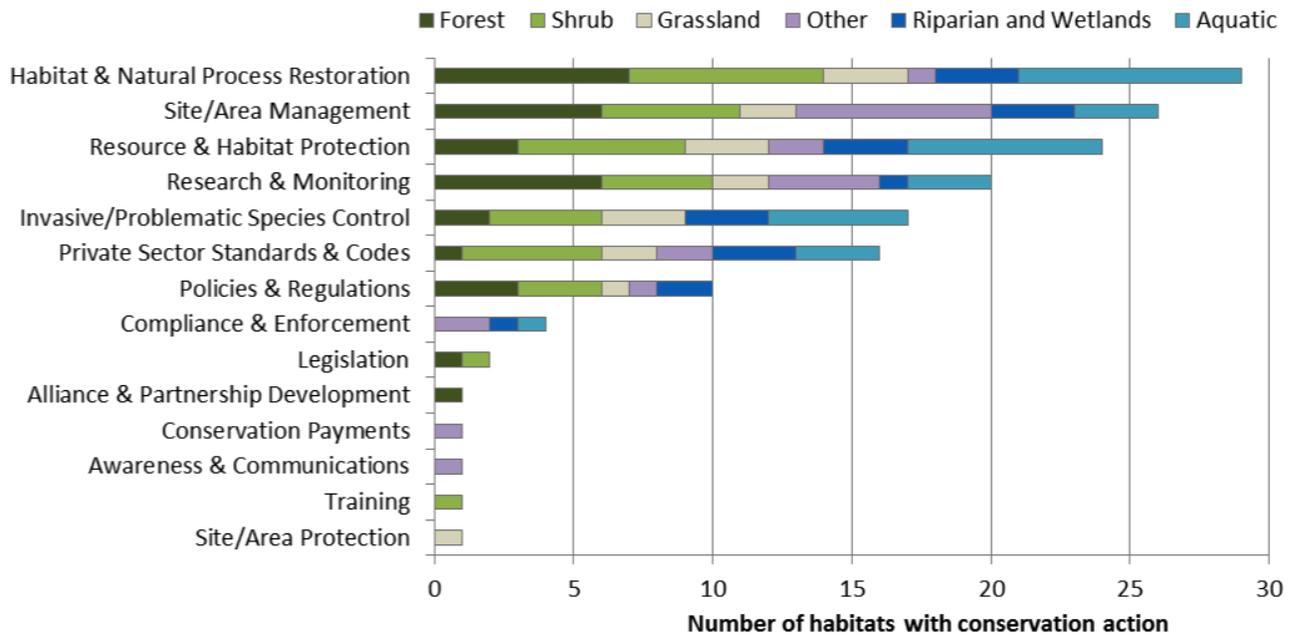
<sup>3</sup>Though the SWAP recognizes some habitat value in reservoirs, creation of these kinds of conditions are not compatible with most of Colorado’s native biodiversity; therefore, this habitat is not included in consideration of threats or targeted for conservation action.

<sup>4</sup>[http://www.cnhp.colostate.edu/download/documents/2014/CO\\_SWAP\\_Enhancement\\_CCVA.pdf](http://www.cnhp.colostate.edu/download/documents/2014/CO_SWAP_Enhancement_CCVA.pdf)

**Figure ES 3. Threats to habitats by habitat type.**



**Figure ES 4. Conservation actions needed for habitats by habitat type.**



## Element 5: Monitoring

Monitoring of SGCN will first employ existing surveys and inventories, including monitoring being done by CPW and conservation partners. For many of the highest priority SGCN, long-term monitoring efforts are on-going (see Table 9 in the full Colorado SWAP). In a number of cases, monitoring or research will need to be the first step when existing status of, and threats to, SGCN are unknown. There are three Tier 1 and 41 Tier 2 vertebrate and mollusk SGCN not currently covered by existing monitoring efforts. Development of monitoring programs will be a priority conservation action for many of these species.

CPW's Colorado Natural Areas Program (CNAP) provides monitoring of rare species, especially rare plants (see Appendix A in the full Colorado SWAP). CNAP and some state parks also periodically inventory invertebrates and use volunteers to monitor butterflies. However, of the non-mollusk invertebrate SGCN, very few species are regularly monitored (Appendix B in the full Colorado SWAP), and all of those are monitored only at the local scale. Because CPW does not have legislative authority over these species groups, conservation partners are relied upon to fill this gap. The Colorado Butterfly Monitoring Network<sup>5</sup>, launched in 2013 by the Butterfly Pavilion, is one example of how Coloradans can help meet this need.

There are currently very few monitoring programs for habitat at a statewide scale. The U.S. Forest

Service's national Forest Inventory and Analysis is implemented across all forest types in Colorado by the Colorado State Forest Service<sup>6</sup>. The Colorado State Forest Service also surveys forest insect and disease outbreaks<sup>7</sup>. Habitat monitoring on State Parks is conducted by CPW resource stewardship staff through vegetation plot monitoring. Federal, state, and local public land managers monitor lands within their jurisdictions to varying degrees, but no formal program exists for monitoring habitats across ownership boundaries. As natural resource stewardship evolves over the coming years, identifying new ways to coordinate monitoring of habitats is needed.

To facilitate monitoring the effectiveness of implemented conservation efforts at a statewide scale, periodic assessments of the conservation status of SGCN and key habitats will be conducted following methods developed for the State of Colorado's Biodiversity report (Rondeau et al. 2011). The State of Colorado's Biodiversity presents a measure of the effectiveness of conservation action for select species and ecosystems, following a systematic and repeatable scorecard approach. Rondeau et al. (2011) provides additional details on methods and current results (<http://www.cnhp.colostate.edu>). Note that conditions have already changed for some species and ecosystems reviewed in the 2011 report.

<sup>5</sup> <http://www.nab-net.org/program/colorado-butterfly-monitoring-network>

<sup>6</sup> <http://csfs.colostate.edu/forest-management/forest-inventory-analysis/>

<sup>7</sup> <http://csfs.colostate.edu/forest-management/common-forest-insects-diseases/>



### Conservation Opportunity Areas

A series of maps to help guide conservation efforts across the state were developed or adapted for use in the SWAP. The first six maps, included in Chapter 8 in the full Colorado SWAP, indicate relative condition of freshwater, terrestrial upland,

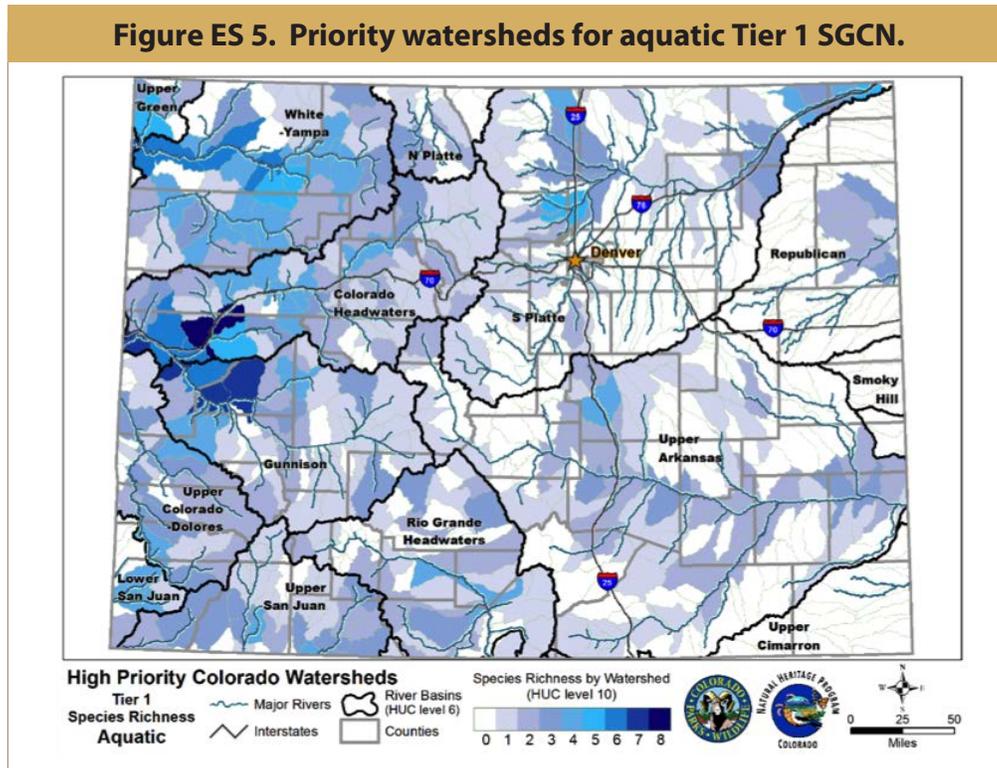
and wetland/riparian habitats. This information can be used to identify areas at a broad scale that are likely to be in higher quality condition, and therefore good candidates for land protection strategies, as well as those that are more likely in degraded condition and in need of restoration.



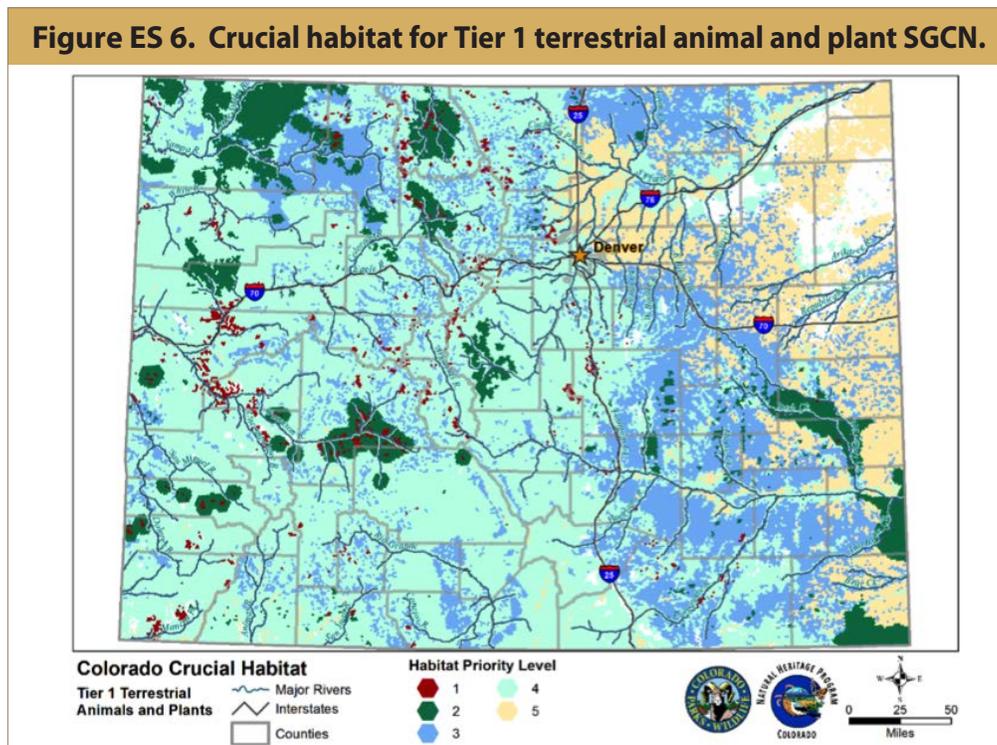
The final two maps, included in this Executive Summary as Figures ES 5 and ES 6, display SGCN concentration areas for aquatic and terrestrial species, respectively. These maps are useful for broad-scale analysis of where conservation efforts might be most warranted and most successful.

It is important to note that these maps take into consideration only those environmental factors that can be mapped at a statewide scale using available data. Data sources and methods used to develop the following maps are described in the full Colorado SWAP.

**Figure ES 5. Priority watersheds for aquatic Tier 1 SGCN.**



**Figure ES 6. Crucial habitat for Tier 1 terrestrial animal and plant SGCN.**



## Element 6: Review and Revision of the SWAP

Guidance provided by the US Fish and Wildlife Service (USFWS) and Association of Fish and Wildlife Agencies (AFWA) Best Practices for State Wildlife Action Plans document for updating SWAPs distinguishes between major revisions and minor revisions. Major revisions include any change to the SGCN list or the threats assessment, or any change that could result in changes to conservation actions or their priority. The SGCN list and the subsequent analyses were generated with an eye

to potential changes in conservation issues over the next decade. Thus, it is not anticipated that there will be a need to conduct major revisions over the 10-year life of this plan. If that need were to occur, USFWS guidance in conducting major revisions would be followed. Meanwhile, as new information becomes available relative to required SWAP elements, it will be incorporated into the SWAP database for use in the next scheduled SWAP update.



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## Elements 7 and 8: Agency Coordination and Public Participation

Over the past decade, familiarity with and use of the SWAP has become routine by many agencies, conservation partners, and stakeholders. Colorado is fortunate to have a relatively well-connected community of conservation practitioners, with a great deal of cross-over in terms of scientific and/or land management expertise among agencies and NGOs. This, combined with the fact that the development of the 2015 SWAP was a revision of an existing document, as opposed to a “starting from scratch” effort, negated the need to distinguish between technical experts and other stakeholders. Thus, the majority of the public participation efforts were focused on improving the scientific content rather than conducting in-person general public information activities. To better facilitate involvement by all interested

parties, collaboration efforts were organized around online participation. During the SWAP revision process, a list of over 300 stakeholders was developed that included representatives from all levels of government, as well as NGOs, Native American Tribes, the private sector, interest groups, and private citizens. This list included all those who participated in the development of the 2006 SWAP, agency and NGO scientists and land managers identified by CPW staff as important collaborators, local governments, members of the Colorado Sportsmen’s Roundtable, and many others.

Maximizing the quality, effectiveness, and efficiency of stakeholder participation was a primary consideration in establishing the methods used to prepare Colorado’s 2015 SWAP. To this end, CPW created an online participation platform consisting of a web page<sup>8</sup> and a dedicated email.



<sup>8</sup> <http://cpw.state.co.us/aboutus/Pages/StateWildlifeActionPlan.aspx>



Stakeholders had four opportunities to provide comments on draft components of the SWAP, and one opportunity to provide final comments on the draft SWAP in its entirety. The process for revising each of the required elements with scientific content (the first five elements) in Colorado’s 2006 SWAP involved the steps listed below:

1. Review of 2006 SWAP content by CPW and CNHP biologists, and drafting of proposed revisions based on the most current information available;
2. Stakeholder comment period (approximately 30 days) of draft revised chapter using dedicated online resources (webpage and email);
3. Final draft chapter prepared;
4. All stakeholder comments compiled along with CPW responses; and
5. All materials posted on CPW’s SWAP webpage for public access.

Over 100 CPW staff were involved in the revision process, including Species Conservation Coordinators, Habitat Coordinators, GIS analysts, CPW Terrestrial and Aquatic biologists, Regional Staff and representatives from CPW’s Research, Real Estate, and Leadership Teams.



# Moving Forward

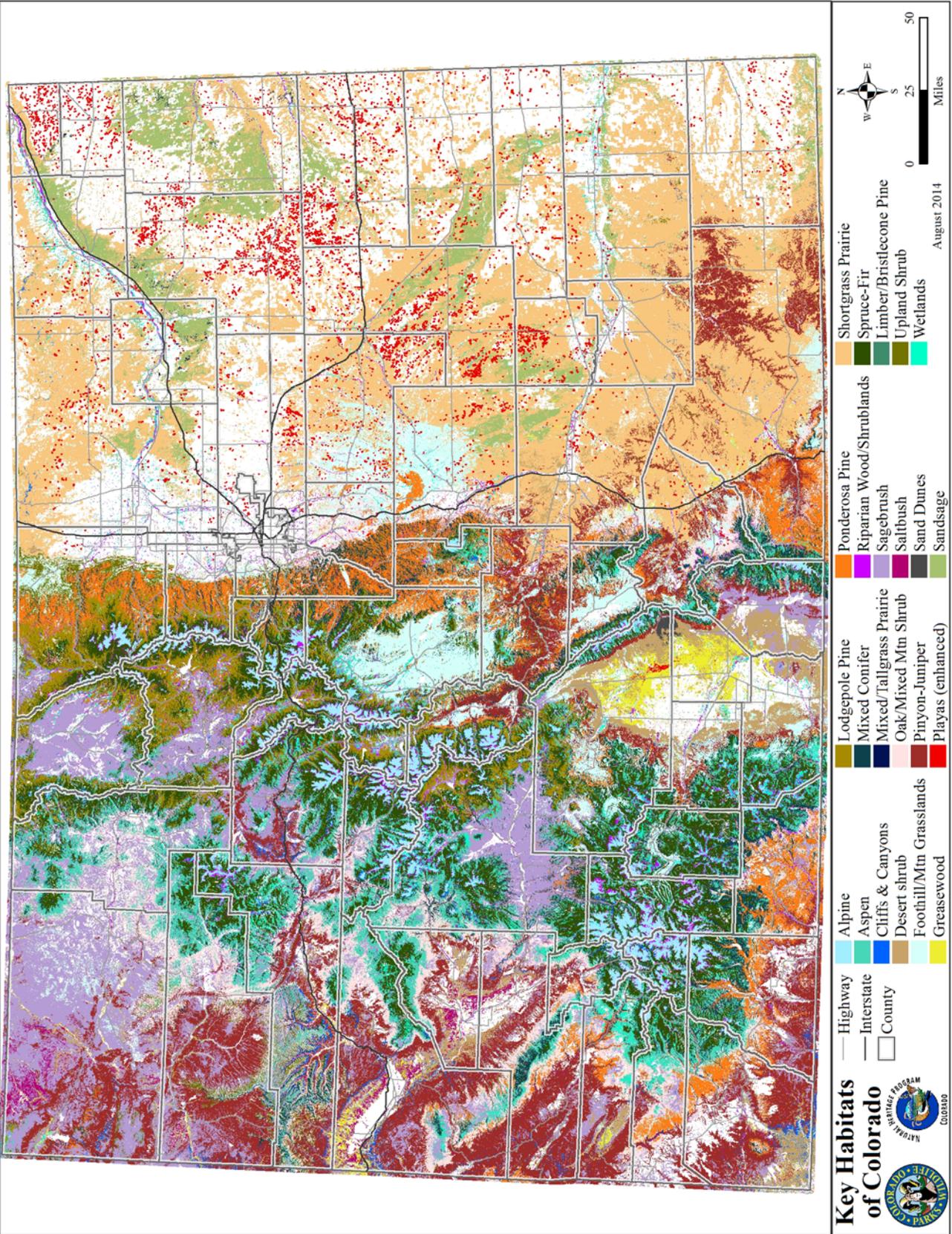
Colorado's revised SWAP serves as a blueprint for conservation and provides a catalog on the status of the knowledge about native wildlife and plants (most of which are not commonly hunted or fished), threats to the habitats upon which they depend, and strategies to lessen, mitigate, or manage those threats. Thus, Colorado's SWAP is comprehensive in scope and strategic in nature. This SWAP reflects the data that currently exist for Colorado species and their habitats and the collective judgment of many of Colorado's scientists, as well as the interests and concerns of citizens with a stake in Colorado wildlife conservation.

Implementation of this plan is beyond the scope of a single agency. The issues addressed and the actions outlined in this plan cross political, jurisdictional, and ecological boundaries. Commitment, coordination and communication among the diverse and interested parties involved are critical to the collaborative success that the SWAP describes and aims to achieve. Developing the plan to achieve those goals is the first step, and this has been accomplished. Implementation is the next step and, collectively, we look forward to this important and collaborative effort.



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# ES 7. Key habitats of Colorado.





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