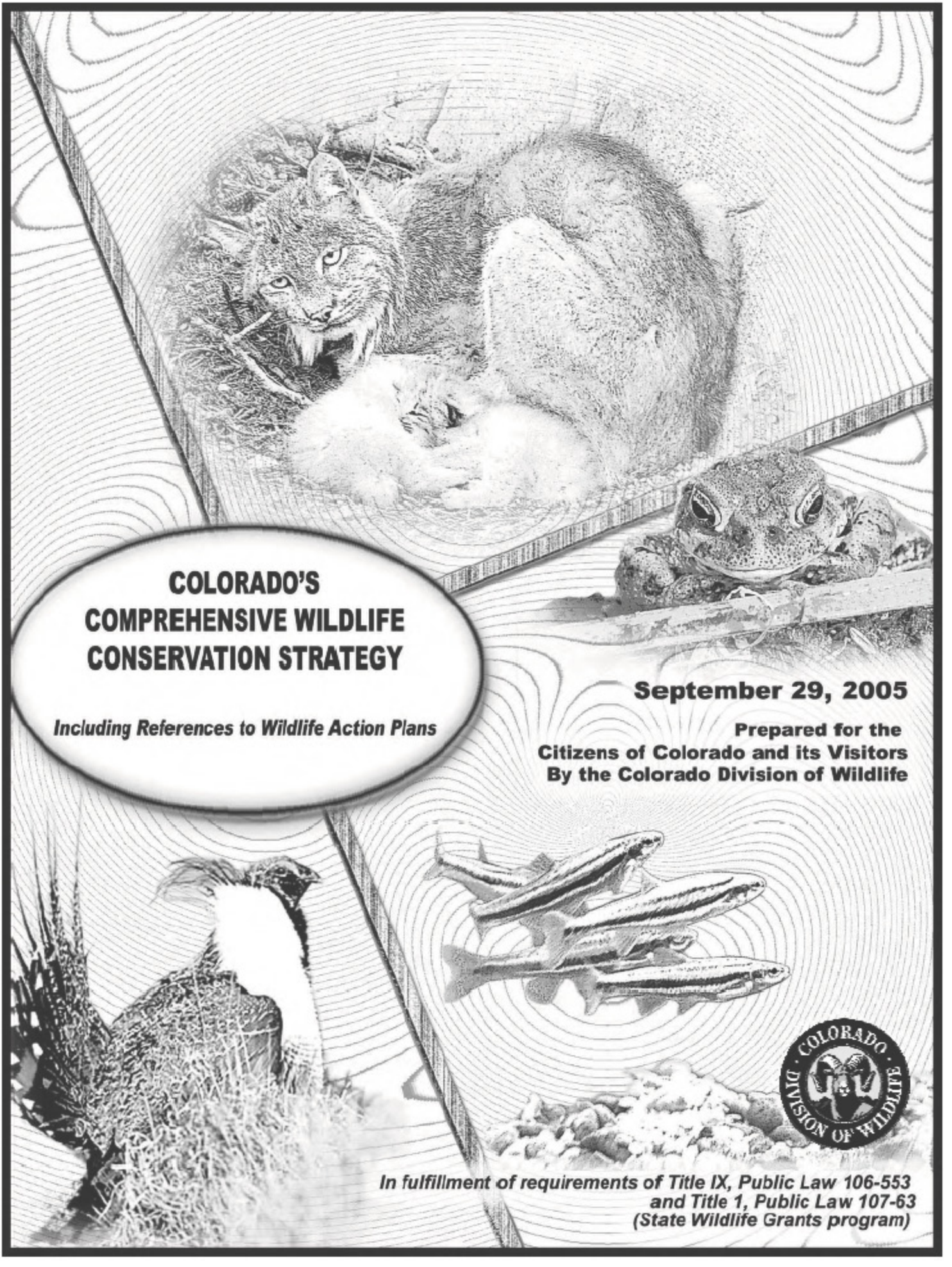

# COLORADO'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

*Including References to Wildlife Action Plans*

**September 29, 2005**

**Prepared for the**
**Citizens of Colorado and its Visitors**
**By the Colorado Division of Wildlife**

***In fulfillment of requirements of Title IX, Public Law 106-553***
***and Title 1, Public Law 107-63***
***(State Wildlife Grants program)***

## Foreword

United States' laws and policies place the primary responsibility for wildlife management in the hands of the states. The states have a lengthy success record of conserving species, including those that are hunted or fished and those that are not. In Colorado, these successes with both "game" and "nongame" species have been paid for largely with hunter and angler license fees and federal excise taxes on hunting and fishing equipment, although in recent years lottery proceeds (GOCO) and Species Conservation Trust Fund dollars have expanded the funding base. It is no surprise that the task of conserving all species will take more than traditional funding sources.

The State Wildlife Grants program (*Title IX, Public Law 106-553 and Title 1, Public Law 107-63*), created through federal legislation, is meant to help close the funding gap by providing federal dollars for a state to use on conservation projects aimed at preventing wildlife from becoming endangered. This Comprehensive Wildlife Conservation Strategy (CWCS) for Colorado has been prepared in fulfillment of the requirements of that legislation. Beyond those requirements is a more fundamental goal for this Strategy, a goal of the Colorado Division of Wildlife 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.

Colorado's CWCS has assembled for the first time a catalog on the status of our knowledge about native wildlife, most of which are not commonly hunted or fished, the threats to the habitats upon which they depend, and an articulation of strategies that can be employed to lessen those threats. Thus, Colorado's CWCS is comprehensive in scope, and strategic in nature. This CWCS reflects the data that currently exist for Colorado species and their habitats, 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.

## Executive Summary

Colorado's Comprehensive Wildlife Conservation Strategy (CWCS) catalogs the status of our knowledge about many wildlife species, most of which are not hunted or fished, the threats to the 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 the Colorado Division of Wildlife 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 (T*itle IX, Public Law 106-553 and Title 1, Public Law 107-63)* by addressing the eight elements stipulated in that legislation.

Information on the distribution and abundance of species of wildlife – 205 species met the criteria for inclusion as Species of Greatest Conservation Need or, in a few cases, were included for specific reasons as noted in the document. Those criteria were based upon status under the federal ESA, state classification, level of imperilment according to generally accepted evaluation systems or broad status assessments. Evaluations of additional species suggested for inclusion through the public comment processes are included for informational purposes. Although knowledge about many species has increased substantially in recent years, there are no data or other bases for science-based opinion about the population status for 33 (16%) of those species, or the population trend for 81 (40%) of the 205 species.

Locations and relative condition of key habitats – A total of 41 land cover types comprise the Colorado landscape. Although species – land cover type associations (i.e., habitat) are well documented in Colorado by CDOW, Colorado Natural Heritage Program, U.S. Forest Service and others, only in relatively few cases do data exist that adequately describe their ability to support native wildlife (i.e., "condition"). To bridge that gap, the CWCS relied heavily upon the judgment of the panels of scientists to assess those relative habitat conditions. Those panels as well as interested publics encouraged a more integrative, landscape-level view of those 41 types to address their interrelatedness. Following this approach, and pooling across all taxonomic groupings demonstrated that the landscape of eastern Colorado - eastern plains river and stream systems (including riparian), tallgrass and midgrass prairie – and sagebrush were judged as being among those in the poorest condition to support native species, while most other types were considered adequate or good for at least some taxonomic groupings. The greatest proportion of land cover types assessed as "poor" occurred for birds, with roughly one-quarter of the land cover types receiving that assessment. Perhaps of even greater concern, given the longer-range perspective of the Strategy, was that trends in habitat conditions were judged to be declining in most land cover types across all taxa, with the notable exceptions ("stable") tending to be in the higher elevation streams and forested lands and in agricultural croplands.

Issues that may adversely affect species of greatest conservation need or their habitats and priority research and survey efforts needed – The key issues identified during the CWCS development process included habitat conversion, infrastructure and other resource demands from a growing Colorado population, recreational demands, invasive, exotic species, and organizational capacity (coordination, funding, and information gaps). A listing of threats and potential actions are provided for specific taxa and their affiliated habitats. The many "unknowns" discussed (e.g., 16% species of unknown status, 40% species of unknown trends) indicates priority research and survey needs for the subject species or habitats. A more overarching need, repeatedly stressed during conversations among contributors to the CWCS, is an efficient, streamlined system, including a common data repository, for rapid data integration and sharing among all entities conducting species and habitat surveys.

Conservation actions necessary to conserve the identified species and habitats and priorities for implementing – Drawing upon the species and habitat-specific actions referenced previously, the CWCS categorizes 33 major types of conservation actions in 5 strategic areas that should be considered when actions affecting wildlife are undertaken in the state. The strategic areas include representing wildlife values in multi-purpose planning or other decision-making processes, public education and law enforcement, wildlife management (including expansion of partnerships with private interests), conservation of habitats, and maintaining and re-establishing landscapes and landscape connectivity. A guide to general priorities for all partners to consider in proposing and implementing specific projects is presented. In many cases, as in the dozens of action plans (recovery or other conservation plans and agreements) referenced in and accessible through the CWCS, specific operational priorities already have been established, frequently using similar science-and-stakeholder processes that were used in the development of the CWCS. This Comprehensive Strategy is intended to complement, not replace, the operational planning and prioritization processes that are in place for the Division of Wildlife or other conservation agencies and organizations in Colorado. To facilitate the integration of action plans with the Conservation Strategy, the Division of Wildlife has initiated a central location on its web site to provide access to all conservation, recovery, or other action plans for Colorado's wildlife species.

Strategies for monitoring identified species, their habitats, and the effectiveness of conservation actions – Beyond monitoring needs for species, species assemblages, and habitats listed in the CWCS, utmost in priority is the ability to monitor progress toward benchmark measures of success and population security thresholds. Input clearly reflected the need for a comprehensive system that allows information from past and future inventories, surveys, research, and management actions to be accumulated from all entities, consolidated at multiple scales, and easily and rapidly distributed and compared to benchmarks. A recent governor's initiative in Colorado to consolidate data on protected lands in the state, the Colorado Ownership, Management, and Protection project (COMaP) may provide a conceptual model or pilot for such an undertaking.

Procedures to review the Comprehensive Wildlife Conservation Strategy – In the near term, CWCS review and incorporation of new information will be performed in traditional fashion using similar procedures to this initial effort, at an interval of not less than 5, and no more than 10 years. This will allow the effects of the Strategy and the operational or action plans and activities that flow from it to be adequately expressed and evaluated before modification. The preferred option over the longer term, however, is to follow a more aggressive adaptive management strategy, with the CWCS residing on a database platform (vs. a fixed text document), allowing ongoing updates to reflect changes in species and habitat status, conservation accomplishments as they occur, and to allow continuous, instead of punctuated, public involvement and feedback (i.e., a "living" strategy). Oversight and maintenance of such a systems approach would be accomplished *via* pooled resources of collaborating entities, including an oversight committee of those collaborators. Given current fiscal, logistical, and technological constraints, contributors to the CWCS who recommended this approach typically acknowledged it as a longer-term vision rather than an initiative to be undertaken in the immediate future.

Coordination with federal, state, and local agencies and Native American tribes – The CWCS calls for a transparent and participatory approach to coordination with partners and the integration of the priorities identified in this CWCS into the substantial wildlife management infrastructure that already exists in Colorado (an extensive listing of current multi-agency plans and agreements is provided). The recommendations repeatedly heard during the development of the CWCS for improved and streamlined information and data-sharing systems will work to improve this coordination.

Ensure public participation – Public participation in the development of the CWCS was encouraged and accomplished through multiple means, including direct mailings (2 mailings to about 1,000 individuals and organizations), publicity and posting of the draft document and mechanisms to provide input *via* CDOW's web site, additional publicity through periodic news releases and media interviews, 2 sets of public meetings around the state (4 locations each), and other meetings with groups of conservation organization representatives (e.g., the CDOW-sponsored Environmental Round Table, Partners in Flight). The final round of public input resulted in formal comments and suggestions from 91 members of the public, organizational representatives, and agency personnel. There were over 1,600 visits to the CWCS postings on CDOW's CWCS web site during the period of public input. For the most part, those suggestions regarding style (editorial) and those that were strategic in nature have been addressed in the CWCS. Future public involvement will, at a minimum, mimic this initial process, although the preferred option is to allow continuous public contributions as part of the review process previously described.

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## A. Introduction

### Background

For many years fish and wildlife conservation in Colorado, and in the nation, has been funded primarily by sportsmen and sportswomen. That funding has come largely from two sources: (1) revenue from the sale of fishing, hunting, and a few other types of licenses; and (2) federal excise tax revenue from sales of fishing and hunting equipment, apportioned back to states through a set formula. However, the use of this funding typically has been weighted toward the conservation of hunted or fished species. Many other species have not been covered by a reliable funding mechanism; although in recent years, Colorado's lottery funds (GOCO) and the Species Conservation Trust Fund have contributed substantially to narrowing this gap. Species identified as federally threatened or endangered under the Endangered Species Act receive additional attention but not necessarily adequate funding.

Recognizing that there has not been enough revenue at a national level available for conservation of all wildlife species, leaders in the conservation community have sought to provide a new source of funding. Teaming With Wildlife, a diverse national coalition of conservationists, hunters, anglers, and conservation-minded agencies, organizations, and businesses lobbied for passage of the necessary national legislation for this new source of funding. The results have been encouraging.

The Commerce, Justice and State Appropriations Act of Fiscal Year 2001, Title IX, Public Law 106-553 created the Wildlife Conservation and Restoration Program (WCRP), designed to provide funding for the conservation needs of wildlife, as well as for education and wildlife-related recreation. The WCRP was only funded for one year. A second act, the Department of the Interior and Related Agencies Appropriations Act of 2002, Public Law 107-63, Title 1, created a State Wildlife Grants program (SWG), which provides annual funding for conservation of wildlife and wildlife habitats. The SWG requires that each state develop a Comprehensive Wildlife Conservation Strategy (CWCS) by October 2005, to remain eligible for SWG funding. This CWCS meets Colorado's obligation under this law.

### Colorado's CWCS Approach and Guiding Principles

Although development of Colorado's CWCS was coordinated by the Colorado Division of Wildlife (CDOW) it is not simply a strategy for that agency. It is a strategy for all of Colorado. The task of preserving and managing Colorado's fish and wildlife is too big for any one group or agency to achieve alone. This document identifies a roadmap of potential conservation priorities that can be used by everyone in Colorado as a guide for planning, partnership building, and project design.

The CWCS articulates a set of ***strategic*** conservation priorities, a statewide perspective that considers an expansive array of wildlife across the whole state. The

CWCS is intended to be a strategic plan, not an operational or specific action plan. Its purpose is to foster greater consistency in future conservation actions, as well as those already underway in Colorado's wildlife conservation community, to meet the state's wildlife conservation needs. As such, this CWCS is designed to complement the substantial planning and active management programs that already exist in Colorado (~ 70 relevant plans were identified and considered). It is intended that Colorado's CWCS not re-invent the work others are doing and that it not pre-empt ongoing wildlife management processes for single species or small groups of species. When appropriate, it is intended that cooperation with adjacent states will result in range-wide conservation of species of greatest conservation need.

Colorado's CWCS is not a legal document, a regulatory document, a Recovery Plan under the Endangered Species Act (ESA), nor a NEPA (National Environmental Policy Act) decision document. While representatives from appropriate agencies such as the U.S. Forest Service, Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service participated in the preparation of this plan, all parties should consider this guidance along with other information as they implement actions that follow established public participation protocols and legal requirements when preparing decision documents and project proposals.

The guiding principles of this strategy are to (1) encourage and support conservation actions that meet the needs of species of greatest conservation need; (2) manage for healthy key habitats and ecosystems so that all species of greatest conservation need will benefit; (3) create a strategy that will be flexible enough to incorporate new research findings and successful management innovations into conservation actions; (4) acknowledge the pivotal role that private landowners and local stakeholders play in conservation; (5) enhance, not replace, other planning efforts; and (6) maintain an atmosphere of cooperation, participation, and commitment among wildlife managers, landowners, private and public land managers, and other stakeholders in development and implementation of conservation actions.

A major tenet of Colorado's strategy is that conservation works best and is more efficient and enduring when accomplished at the local level. Ultimately, the aim is to achieve within Colorado "civic environmentalism" (Shutkin 2000:14) – interest groups working together rather than vying to defeat each other. It is a process and an end point that develops consensus resulting in benefits to the environment and the community (The Nature Conservancy 2004, Zeller 1999)**.**

**Federal CWCS Requirements: The Eight Elements**

The Colorado CWCS meets the requirements of guiding federal legislation. It is based on the best available information and identifies data gaps where they exist. It is and will continue to be the result of involving virtually all of Colorado's conservation agencies and organizations, federal and tribal managers, and affected stakeholders.

The enabling legislation and regulations governing the SWG and related programs stipulate that a state's CWCS contain the following eight elements (referred to throughout the CWCS as "Element 1, Element 2, etc.):

Element 1. Information on the distribution and abundance of species of wildlife, including low population and declining species as the State fish and wildlife department deems appropriate, that are indicative of the diversity and health of (Colorado's wildlife)" (P.L.106-553 Title IX Sec. 902);

Element 2. Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1);

Element 3. Descriptions of issues that may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats;

Element 4. Descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions;

Element 5. Proposed strategies for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions;

Element 6. Descriptions of procedures to review the Comprehensive Wildlife Conservation Strategy at intervals not to exceed 10 years;

Element 7. Approach for coordinating, to the extent feasible, the development, implementation, review, and revision of the CWCS with federal, state, and local agencies and Native American tribes that manage significant land and water areas within Colorado or administer programs that significantly affect the conservation of identified species and habitats; and

Element 8. Provisions to ensure public participation in the development, revision, and implementation of projects and programs. Congress has affirmed that broad public participation is an essential element of this process.

## B. Colorado CWCS Development Process

Several progressive steps were involved in developing the CWCS, generally following the Required Elements in the federal legislation (Fig.1 and sidebar). The CWCS development process began with identifying "species of greatest conservation need." This was prepared by reviewing available information on wildlife species distribution and abundance (Element 1) and then ascertaining which species were most at risk of decline. The location and condition of habitats that are important for these species of greatest conservation need were then assessed (Element 2). Both panels of experts as well as stakeholder meetings identified issues potentially impacting these key habitats (Element 3) as well as possible conservation actions to address the issues (Element 4). Options for research and surveying efforts were prioritized, and potential monitoring plans were proposed (Elements 4 and 5).

| Progressive Steps Used to Create Colorado's CWCS | Required Elements Addressed by This Activity |
|---|---|
| Step 1. Draft initial list of species of greatest conservation concern by CDOW staff. | 1 |
| Step 2. Internet questionnaire to Colorado's scientific community to review Step 1 and create initial assessments of species' population status and condition of key habitats. | 1,2,8 |
| Step 3. Stakeholder meetings to scope out concerns and opportunities. | 3,4,6,7,8 |
| Step 4. Science Forum to refine content developed in Steps 1 and 2 and establish priorities. | 1,2,3,4,5,7,8 |
| Step 5. Draft of the CWCS | 2,6,7,8 |
| Step 6. Stakeholder meetings to review the draft CWCS (from Step 5). | 1,2,3,4,5,6,7,8 |
| Step 7. Internet-based review of the draft CWCS (from Step 5). | 1,2,3,4,5,6,7,8 |
| Step 8. Final draft of the CWCS responding to information received in Steps 6 and 7). | 1,2,3,4,5,6,7,8 |

Technical expert advice on the conservation of Colorado's mammals, birds, fish, amphibians, reptiles, mollusks, insects, and arachnids was explicitly solicited (Fig. 1). In February, 2005, a questionnaire (guided in part by the results of the November 2004 public meetings) was sent to 117 experts to gather their assessments of the status and trends of Colorado's wildlife species and their habitats. A meeting of Colorado's scientific community (Science Forum) was conducted in March, 2005. The Science Forum served to further quantify and articulate species and habitat status and to identify issues facing the species as well as potential conservation actions to address the issues.

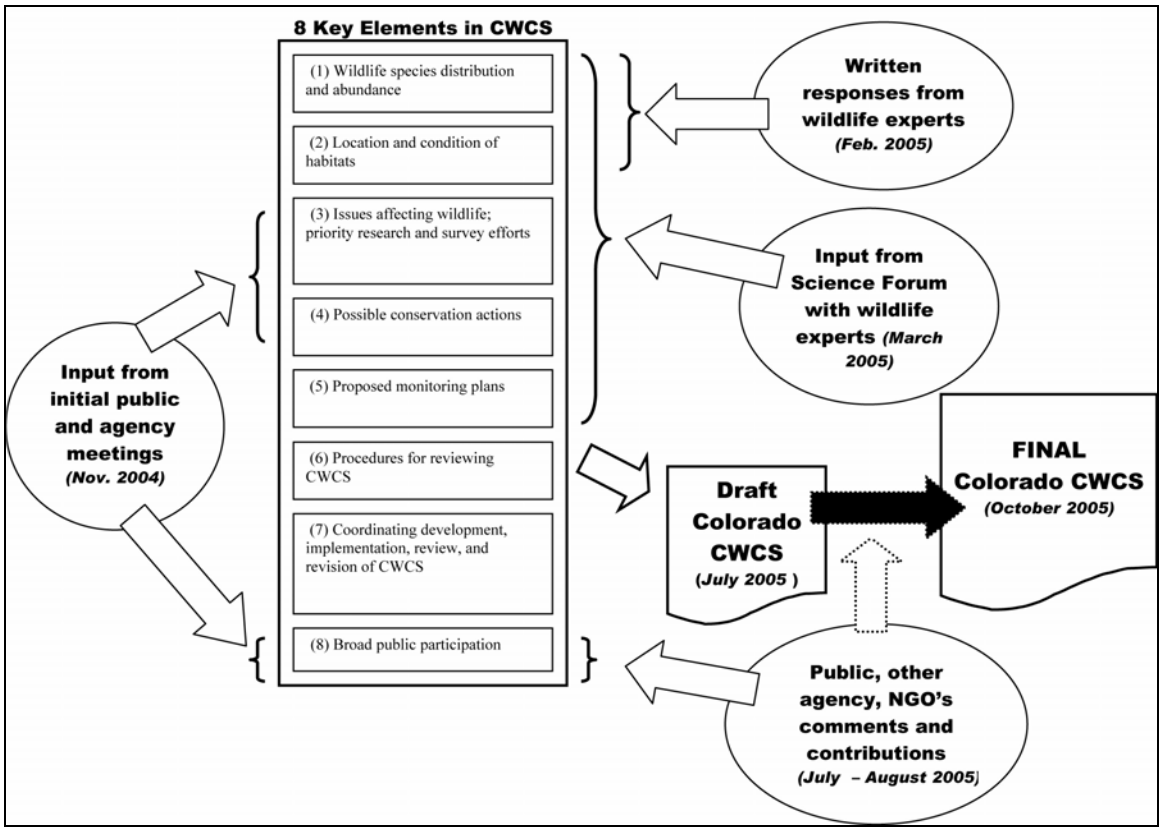


Fig. 1. Colorado CWCS development process.

**Public and Technical Expert Participation**

Public participation involved both internal (CDOW) and external stakeholders. Expert participation involved a broad array of wildlife experts with knowledge about Colorado wildlife. Vehicles for providing this information and inviting participation were:

- two direct mailings (September 2004 and July 2005), of approximately 1,000 letters each, to CDOW's existing constituent and mailing lists,
- news releases and newspaper articles announcing the initiation of the process and providing updates,
- periodically updated information on the CDOW website since September 2004,
- initial meetings around the state in November 2004, one in each of the four CDOW regions, with internal (CDOW) and external agency/public audiences,
- monthly meetings with the CDOW-sponsored Environmental Round Table, consisting of representatives of Colorado's environmental organizations,
- briefings to the Wildlife Commission,

- internal and external briefings (e.g., the 50-60 people who attended the April 2005 Partners in Flight Group),
- communications over the internet with technical experts,
- a questionnaire sent to 117 experts to gather basic information on Colorado's wildlife species (considering the scientific community as stakeholders),
- a meeting of Colorado's scientific community (i.e., the Science Forum), reported later in this document (March 2005) providing technical information and scientific opinions,
- a second round of meetings around the state in July 2005, one in each of the four CDOW regions, with internal and external agency/public audiences, and
- a mechanism to submit written and electronic (e-mail) comments on the draft CWCS.

## Partnership Solicitation

Identification of potential partners began early in the process and continued throughout development of the CWCS. In addition, a listing of potential partners was generated during the Science Forum and the second round of stakeholder meetings. Some of these potential partners may be viewed as "generalists," with concerns across all taxa. Others seem suited for assessments of particular taxonomic groups and habitats, implementing conservation actions, and/or for monitoring the taxonomic groups indicated (Table 1).

Table 1. Potential partners and likely areas of concern.

| Potential Partners | | | | | | |
|---|---|---|---|---|---|---|
| Organization or Type of Organization | Taxonomic Group(s) | | | | | |
| | All Taxonomic Groups | Invertebrates | Fish and Mollusks | Reptiles and Amphibians | Birds | Mammals |
| **Federal Agencies** | | | | | | |
| USDA Forest Service | X | | | | | |
| Bureau of Land Management | X | | | | | |
| U.S. Fish and Wildlife Service | X | | | | | |
| National Park Service | X | | | | | |
| U.S. Geological Survey | X | | | | | |
| Natural Resources Conservation Service / Farm Service Agency | X | | | | | |
| Bureau of Indian Affairs | X | | | | | |
| Bureau of Reclamation | X | | | | | |
| U.S. Corps of Engineers | X | | | | | |
| Federal Emergency Management Agency | X | | | | | |
| **Tribes** | X | | | | | |
| **State Agencies** | | | | | | |
| Colorado Division of Wildlife | X | | | | | |

| Potential Partners | | | | | | |
|---|---|---|---|---|---|---|
| Organization or Type of Organization | Taxonomic Group(s) | | | | | |
| | All Taxonomic Groups | Invertebrates | Fish and Mollusks | Reptiles and Amphibians | Birds | Mammals |
| State Forest Service | X | | | | | |
| State Universities | X | | | | | |
| Department of Natural Resources | X | | | | | |
| Department of Agriculture | X | | | | | |
| Department of Transportation | X | | | | | |
| Department of Health and Environment | X | | | | | |
| Water Quality Control Commission | X | | | | | |
| Colorado Natural Heritage Program | X | | | | | |
| Colorado State University Extension Offices | X | | | | | |
| Division of Parks and Outdoor Recreation | X | | | | | |
| Division of Water Resources | X | | | | | |
| Oil and Gas Commission | X | | | | | |
| Division of Minerals and Geology | X | | | | | |
| Water Conservation Board | X | | | | | |
| Great Outdoors Colorado | X | | | | | |
| **Local government** | | | | | | |
| Cities | X | | | | | |
| Counties | X | | | | | |
| Water Conservancy districts | X | | | | | |
| **State agriculture and ranching associations** (e.g., Colorado Cattlemen's Association, Farm Bureau, Colorado Wool Grower's Association) | X | | | | | |
| **Non-governmental Organizations** | | | | | | |
| Rocky Mountain Bird Observatory | | | | | X | |
| Audubon (e.g., important bird area programs) | | | | | X | |
| The Nature Conservancy | X | | | | | |
| Colorado Natural Heritage Program | X | | | | | |
| Local land trusts | X | | | | | |
| Ducks Unlimited; Quail Unlimited; Pheasants Forever; Trout Unlimited; sport groups, etc. | | | X | | X | X |
| Joint Ventures (e.g., Playa Lakes) | | | | | X | |
| Bird Conservation Initiative | | | | | X | |
| Partners in Amphibian and Reptile Conservation | | | | X | | |
| Colorado Weed Management Association | X | | | | | |
| Colorado Association of Conservation Districts | X | | | | | |
| Environmental Defense | X | | | | | |

| Potential Partners | | | | | | |
|---|---|---|---|---|---|---|
| Organization or Type of Organization | Taxonomic Group(s) | | | | | |
| | All Taxonomic Groups | Invertebrates | Fish and Mollusks | Reptiles and Amphibians | Birds | Mammals |
| Southern Rockies Ecosystem Project | X | | | | | |
| **Museums** | X | | | | | |
| **Zoos** | X | | | | | |
| **Biological professional societies** (e.g., Colorado Herpetological Society, American Fisheries Society, The Wildlife Society) | X | | | | | |
| **Private Sector** (e.g., land owners, pet shops, nurseries) | X | | | | | |

*First Round of Stakeholder Meetings – Purpose: Scoping*

**Place and Date of CWCS Meetings**

Colorado Springs – November 16
Denver – November 17
Grand Junction – November 18
Durango – November 19

During the week of November 15, 2004, public and staff meetings were held in each of the four CDOW regions of the state. In these meetings participants were given a short presentation on the intent for Colorado's CWCS and then asked to comment on the issues they thought would fit into a CWCS and the advice (solutions) they thought would help a CWCS address the most pressing issues. In these facilitated meetings the participants defined the content they thought important in a CWCS. Across the state 103 members of the public and 27 staff provided input. Their input was collated into the following unranked summary of the main strategic themes that emerged across the state:

*Habitat-related Issues*

- Habitat loss and fragmentation associated with urban and industrial development without adequate habitat safeguards
- Water quality and quantity
- Preserving property rights
- Local government land-use planning impacting wildlife
- Working with/on critical habitat types (e.g., sagebrush, shortgrass prairie, riparian, etc.)
- Wildlife corridors and crossings
- Grazing on public lands (may include wild and domestic animals)

*Wildlife Population Issues*

- Managing individual species that are under stress (e.g., Lynx, prairie dogs, piping plovers, boreal toads, kit foxes, bats)
- Predator management (both for and against)
- Diseases
- Lack of information about important wildlife issues and/or species (e.g., badgers)
- Lack of baseline information
- Invasive, exotic species (terrestrial and aquatic)

*Societal issues*

- Insufficient agency staffing
- Politicization of wildlife management
- Lack of stable funding for wildlife management activities
- Poor general public understanding of wildlife values and needs

*Advice for Achieving an Effective CWCS - Biological*

- Use sound science
- Manage for "keystone" species as indicators of larger needs
- Manage beyond individual species to something more comprehensive like ecosystems or watersheds and using or mimicking natural processes (e.g., fire regimes)
- Focus on key, threatened types of habitat (e.g., roadless areas, wetlands)
- Improve science-based management tools (e.g., for habitat assessment, monitoring)
- Keep species from declining to the status where a listing might be considered
- Develop / use a cooperative approach with willing partners
- Manage with clear (and understandable) priorities and objectives (i.e., get the most bang for the buck)

*Advice for Achieving an Effective CWCS - Organizational*

- Ensure funding is available for a long enough term to fit the scale of projects that are needed (i.e., match fiscal allocations to the needed planning horizons)
- Feature landowner incentives
- Compensate landowners
- Strengthen legal / regulatory tools to protect declining species
- Broaden public involvement in wildlife management
- Explore alternative forms of public participation in selection of Wildlife Commissioners
- Improve inter-agency cooperation across local, state, federal, tribal lines

*Unclassified or Operational (non-Strategic) Issues*

- Need a better or common definition of what 'species conservation' means
- Balance resource allocations between charismatic and other, potentially more needy but less popular, species
- Transparent fiscal management of the CWCS
- Have a simple process for allocating funds
- Make operation and maintenance costs eligible
- Have a healthy information and education component

## *Second Round of Stakeholder Meetings and Written Input - Purpose: Review Draft CWCS*

**Place and Date of CWCS Meetings**

Denver – July 25
Colorado Springs – July 26
Grand Junction – July 27
Durango – July 28

The Draft CWCS and various input mechanisms were released for public comment and contributions on July 11, 2005, with the comment period extending through August 8, 2005. During the week of July 25, 2005 public and staff meetings were held in each CDOW region of the state, repeating the pattern of the November 2004 scoping meetings. In these meetings participants were asked to provide specific suggestions to improve the draft CWCS which was made available on the CDOW website beginning on July 11

and publicized through the media prior to the meetings. These were facilitated question, answer, and listening sessions to collect comments and suggested deletions, changes, and additions to the draft CWCS. Across the state 74 members of the public and 17 staff provided input and/or attended one of the meetings. Over 200 specific comments were received, and there were over 1,600 visits to the CWCS postings on CDOW's CWCS web site during the comment period. The detailed, point-by-point input was collated and considered in revising the draft CWCS. The following is an unranked summary of the main strategic themes that emerged across the state:

- A number of editorial concerns (e.g., clarifying how our process led to priority, species and habitat assessments; language and style issues),
- Be more explicit about priorities,
- Describe next steps and how the public/partners will be involved,
- Define how the document will be maintained and updated,
- Clarify the state's commitment to the long-term CWCS process,
- Increase the emphasis on invasive, exotic species,
- Increase the emphasis on base-line assessments,
- Increase the emphasis on habitat conservation in wildlife corridors, habitat/population connectivity, and crossings,
- Increase the emphasis on road / transportation management,
- Broaden management attention to heretofore unacknowledged 'wildlife' species (e.g., insects, mollusks, spiders)
- Add additional species to the list of Species of Greatest Conservation Need

*Outcome of Stakeholder Meetings*

For both rounds of stakeholder input, suggestions that were strategic in nature as well as those regarding presentation/organization of the document (editorial) have usually been addressed in the CWCS. A number of suggestions were operational in nature and thus more appropriate for specific action plans. Many of these are accommodated through the species-specific action plans referenced elsewhere in the CWCS (*see* Sections I and K).

**Coordination with Federal, State, and Local Agencies, and Native American Tribes**

Other government managers received informational mailings and invitations to participate in the stakeholder meetings, participate in the Science Forum, and submit comments independently. The two Colorado Native American tribes with management programs received letters inviting comments and participation, invitations to the public meetings and Science Forum, and were contacted by CDOW staff to seek their participation in development of the CWCS. All Native American

tribes on Colorado's Colorado Tribal Contacts List [1]received two mailings about the CWCS and an invitation to participate.

The governmental organizations and government leaders receiving informational letters and invitations to participate in development of the CWCS included a wide range of federal, state, and local governments (see table, above).

[1] Maintained by the Colorado Commission of Indian Affairs and the Colorado Historical Society at: http://www.coloradohistory-oahp.org/publications/pubs/1550.pdf.

## C. Management and Legal Authorities

A diversity of state, federal, and county regulations offer protection to Colorado's species of greatest conservation need, and there are many management programs that support population and habitat conservation actions. More broadly, there is a diversity of entities that directly or indirectly manage or affect wildlife through their actions. The job of coordinating this diversity of managers is an important institutional determinant of success for Colorado's Comprehensive Wildlife Conservation Strategy. That job falls to the CDOW. The following statutory authorities and policies provide necessary guidance the Division's duties in its role as the state's CWCS coordinator.

The Colorado Division of Wildlife, a branch of the Colorado Department of Natural Resources, has the statutory charge for managing and conserving wildlife resources within state borders, for hunted, fished, and non-game wildlife, including threatened and endangered species[2].

In addition, the 5-year Strategic Plan for the Division of Wildlife, adopted by the Colorado Wildlife Commission on January 11, 2002, emphasizes the importance of wildlife conservation (Colorado Wildlife Commission. 2002. http://wildlife.state.co.us/about/strategicplan/Final_Adoption.pdf ). The plan lists 10 management principles, or 'core beliefs' that guide the agency in fulfilling its mission. These beliefs underscore the importance of wildlife conservation and maintenance of healthy, diverse and abundant wildlife. A specific section of the Colorado Wildlife Commission's Strategic Plan addresses species conservation. The vision statement of this section states: "Recognizing the pitfalls of single species management, the Division of Wildlife will emphasize the development of management approaches encompassing multi-species communities across the landscape. The Division of Wildlife defines species conservation as conserving, protecting, and enhancing Colorado's native wildlife, by taking the actions necessary to assure the continued existence of each species and thereby precluding or eliminating the need for state and/or federal listing. The Division of Wildlife will form partnerships with landowners, land management agencies, and others to manage, protect, enhance, and restore wildlife and their habitat. The Division of Wildlife will lead efforts to monitor wildlife communities and manage them as needed to prevent their decline. The Division of Wildlife will work aggressively with others to recover threatened and endangered species. The Division of Wildlife encourages partnerships to share in the vision to protect, enhance, and restore wildlife communities that need assistance to survive."

[2] Colorado Revised Statutes, Title 33 Article 1-101 states: "It is the policy of the state of Colorado that the wildlife and their environment are to be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. It is further declared to be the policy of this state that there shall be provided a comprehensive program designed to offer the greatest possible variety of wildlife-related recreational opportunity to the people of this state and its visitors and that, to carry out such program and policy, there shall be a continuous operation of planning, acquisition, and development of wildlife habitats and facilities for wildlife-related opportunities." Title 33 Article 2-102 states, "The general assembly finds and declares that it is the policy of this state to manage all nongame wildlife, recognizing the private property rights of individual property owners, for human enjoyment and welfare, for scientific purposes, and to insure their perpetuation as members of ecosystems; that species or subspecies of wildlife indigenous to this state which may be found to be endangered or threatened within the state should be accorded protection in order to maintain and enhance their numbers to the extent possible; that this state should assist in the protection of species or subspecies of wildlife which are deemed to be endangered or threatened elsewhere; and that adequate funding be made available to the division annually by appropriations from the general fund."

This CWCS is consistent with the Wildlife Commission's Strategic Plan and specifically addresses two of the Desired Achievements outlined in that plan:

> S-1.1 The Division will strive to maintain, create, and manage habitat to support the broadest sustainable wildlife populations in Colorado.
>
> S-2.1 The Division will continue its efforts to preserve, protect, and enhance wildlife species that may be at risk of becoming threatened or endangered.

## D. Overview of Colorado Wildlife Species

Colorado's native species occur across our state's 103,000 square miles, including 480 square miles of waters. There are over 960 native species for which the Division of Wildlife has statutory authority, including mammals, birds, fish, reptiles, amphibians, mollusks, and crustaceans. This strategy also includes insects and arachnids[3] that are outside of the Division of Wildlife's authorities.

About 186 species are pursued recreationally (e.g., via hunting, fishing, and falconry) and are classified as game wildlife. Over 740 of the wildlife species (excluding insects and arachnids) are classified as nongame wildlife and recreational take is not permitted. All species are of interest for recreational uses such as bird watching, nature study, and photography**.**

Most of Colorado's wildlife species or populations appear reasonably stable and numerous enough to satisfy recreational demand while not disrupting economic interests and communities in the state. The quality and quantity of Information about Colorado's wildlife species has increased greatly in recent years but, as noted during the public comment period, is often variable in accessibility and presentation, thus not realizing its full potential and utility (e.g. , CDOW's Natural Diversity Information Source (NDIS) http://ndis.nrel.colostate.edu/, Colorado Natural Heritage Program and NatureServe http://www.natureserve.org/, USDA Natural Resource Conservation Service http://www.whmi.nrcs.usda.gov/technical/leaflet.htm); Partners in Flight and Rocky Mountain Bird Observatory http://www.rmbo.org/pif/downloads/downloads.html; U.S. Forest Service http://www.fs.fed.us/r2/projects/scp/ ).

Colorado manages wildlife at the species, subspecies, and population level, depending on various factors such as legal requirements, interagency coordination needs, stakeholder concerns, funding eligibility, national or international reporting conventions, and/or taxonomic determinations through scientific documentation. Colorado also attempts to manage assemblages of species and the array of habitats important to them (i.e., ecosystem management). There is a broad community of interest concerned with Colorado wildlife with significant contributions coming from the non-governmental sector (e.g., see: Southern Rockies Ecosystem Project, 2004 and Southern Rockies Ecosystem Project, et. al, 2003) and the private sector (e.g., the comments of landowners during the stakeholder meetings about the importance of private property to wildlife).

[3] The group of animals that include spiders.

## E. Species of Greatest Conservation Need

The species of greatest conservation need identified in this CWCS represent the diversity and health of the State's wildlife most in need of attention and should integrate well into the many existing wildlife planning and management programs in Colorado. The specific criteria used to include or exclude species in the list of species of greatest conservation need are shown in Table 2. In a few cases, additional species were included for specific reasons as noted in the document. Appendix A provides detail of each species considered, including those that were suggested for inclusion during the public comment period but which were ultimately excluded from the list of Species of Greatest Conservation Need. Although CDOW's statutory authority does not extend to insects or arachnids; they are included in keeping with the guiding principle that this is a plan for all of Colorado, not simply the Division of Wildlife.

Table 2. Criteria used to develop list of Species of Greatest Conservation Need

| | |
|---|---|
| Inclusion Criteria | M*eeting any of the Following* |
| | Listed as federal candidate, threatened or endangered species under the ESA. |
| | Classified as state endangered or threatened species, or species of special concern. |
| | Global ranking scores of G1, G2 or G3 by the Colorado Natural Heritage Program[4]. |
| | Identified as conservation priorities through a range-wide status assessment or assessment of large taxonomic divisions. |
| | Assigned state ranking scores of S1 or S2 AND a global ranking score of G4 by the Colorado Natural Heritage Program[5]. |
| Exclusion Criteria | *Species meeting the inclusion criteria were eliminated from the Species of Greatest Conservation Need listing if they met any of the following:* |
| | Occurs peripherally in Colorado but is common elsewhere AND for which management actions in Colorado are likely to have no population-level effect. |
| | Very common but were placed on lists due to economic considerations (e.g., Mallard). |

Information from numerous sources and the opinions of wildlife experts in the questionnaire and Science Forum were used to derive the assessments of 205 Species of Greatest Conservation Need (Table 3). There are no data or other bases for science-based opinion about the population status for 33 (16%) species, or the population trend for 81 (40%) of the 205 species. Of the 167 species for which population assessments were made, approximately half were judged by panels to exist at low population levels and half were thought to occur at medium to abundant levels. Readers are cautioned, however, that the utility of these judgments is weakened by the lack of consistent standards for the relative terms of "low,"

[4] G1 is critically imperiled globally because of rarity (5 or fewer occurrences in the world; or very few remaining individuals), or because some factor of its biology makes it especially vulnerable to extinction. G2 is imperiled globally because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range. G3 is vulnerable throughout its range or found locally in a restricted range (21 to 100 occurrences). From: Colorado Natural Heritage Program, http://www.cnhp.colostate.edu.

[5] S1 is critically imperiled in state because of rarity (5 or fewer occurrences in the state; or very few remaining individuals), or because some factor of its biology makes it especially vulnerable to extinction. S2 is imperiled instate because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range. G4 is apparently secure in state, though it might be quite rare in parts of its range, especially at the periphery. From: Colorado Natural Heritage Program, http://www.cnhp.colostate.edu.

“medium,” and “high” population levels (*see* Table 14 and recommendations for benchmark measures of success). Seventeen percent of the species were believed to be exhibiting downward population trends, and slightly over 40% were thought to be stable or increasing.

Table 3. Summary of population status and trends for Species of Greatest Conservation Need in Colorado.

| Summary Of Population Status By Major Taxonomic Groups | | | | | | |
|---|---|---|---|---|---|---|
| Species Group | Total Number of Species of Conservation Concern | Number of Species in Each Category | | | | |
| | | Population Status as of March 2005 | | | | Not Rated |
| | | Low | Medium | Abundant | Unknown | |
| Insects | 33 | 7 | 7 | 3 | 16 | |
| Arachnids [1/] | 1 | | | | | 1 |
| Mollusks | 9 | 9 | | | | |
| Fish | 26 | 11 | 13 | 1 | 1 | |
| Amphibians | 9 | 3 | 4 | | 2 | |
| Reptiles | 14 | 6 | 4 | | 4 | |
| Birds [2/] | 87 | 40 | 39 | 3 | 4 | 1 |
| Mammals [2/] | 26 | 9 | 8 | | 6 | 3 |
| Total | 205 | 85 | 75 | 7 | 33 | 5 |
| | | | | | | |
| | | Population Trend as of March 2005 | | | | |
| | | Declining | Stable | Increasing | Unknown | Not Assessed |
| Insects | | 4 | 13 | | 16 | |
| Arachnids [1/] | | | | | | 1 |
| Mollusks | | 5 | | | 4 | |
| Fish | | 5 | 9 | 6 | 6 | |
| Amphibians | | 3 | 4 | | 2 | |
| Reptiles | | 1 | 4 | | 9 | |
| Birds [2/] | | 12 | 36 | 5 | 33 | 1 |
| Mammals [2/] | | 5 | 5 | 2 | 11 | 3 |
| Total | | 35 | 71 | 13 | 81 | 5 |

1/ One species of lampshade spider (*Hypochilus bonneti*) was identified for listing but a population status determination was not made.

2/ Whooping crane, bison, gray wolf, and grizzly bear were discussed by the panels at the Science Forum, but since free-ranging populations are not known in Colorado their population status and trends is moot.

The following Tables 4 through 10 contain assessments of each of the 205 species. Findings that are supported by data are indicated by a “D,” while those where data were not known to exist reflect, the collective judgment of panels of experts participating in the questionnaire and Science Forum and are denoted by “X.” Hence, data/information gaps are highlighted in these tables, implying priority for further inventory and surveys.

At the Science Forum, panels were also charged with identifying those species within each taxonomic grouping they felt had the most pressing needs, indicated by a “+” in the far right column. While “need” is one important component of any prioritization system, it rarely can be the only criteria a management agency or NGO will use in prioritizing their work. Ability to impact, potential funding and partnership opportunities, responding to “one-time-only” opportunities are among the other factors to be considered in such prioritization.

Table 4. Insects - status of species of greatest conservation need. Given the absence of data on insects, the collective judgment of the panel of Science Forum experts is denoted with an "X" (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| **Stoneflies (Plecoptera)** | | | | | | | | | | |
| *Capnia arapahoe* [1/] | Arapahoe snowfly | | | | X | | | | X | |
| *Capnia nelsoni* [1/] | Nelson's snowfly | | | | X | | | | X | |
| *Mesocapnia frisoni* [1/] | Plains snowfly | | | | X | | | | X | |
| **Mayflies (Ephemeroptera)** | | | | | | | | | | |
| *Ametropus albrighti* [1/] | Mayfly, spp. | | | | X | | | | X | |
| **Dragonflies and Damselflies (Odonata)** | | | | | | | | | | |
| *Argia alberta* | Paiute dancer | | | | X | | | | X | |
| *Gomphus intricatus* | Brimstone clubtail | | | | X | | | | X | |
| *Libellula nodisticta* | Hoary skimmer | | | | X | | | | X | |
| *Somatochlora ensigera* | Lemon-faced emerald | | | | X | | | | X | |
| *Sympetrum madidum* | Red-veined meadowfly | | | | X | | | | X | |
| *Tetragoneuria petechialis* | Stripe-winged baskettail | | | | X | | | | X | |
| **Beetles (Coleoptera)** | | | | | | | | | | |
| *Amblyderus werneri* | Great Sand Dunes Anthicid beetle | | | | X | | | | X | |

Table 4. Insects - status of species of greatest conservation need. Given the absence of data on insects, the collective judgment of the panel of Science Forum experts is denoted with an "X" (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Cicindela theatina* | San Luis Dunes tiger beetle | | | | X | | | | X | |
| **Butterflies and Moths (Lepidoptera)** | | | | | | | | | | |
| *Atrytone arogos* | Arogos skipper | | X | | | | X | | | |
| *Euphyes bimacula* | Two-spotted skipper | | | | X | X | | | | |
| *Hesperia leonardus montana* | Pawnee montane skipper | X | | | | X | | | | + |
| *Hesperia ottoe* | Ottoe skipper | | X | | | | X | | | + |
| *Polites rhesus* | Rhesus skipper | | X | | | | X | | | |
| *Pyrgus xanthus* | Xanthus skipper | | X | | | | | | X | |
| *Erynnis martialis* | Mottled Duskywing | | | X | | | X | | | |
| **Gossamer-winged Butterflies** | | | | | | | | | | |
| *Callophrys comstocki* | Comstock's hairstreak | | | | X | | X | | | + |
| *Callophrys mcfarlandi* | Sandia hairstreak | X | | | | | X | | | |
| *Callophrys mossii schryveri* | Moss's elfin | | X | | | | X | | | |
| *Celastrina humulus* | Hops feeding azure | | | X | | | X | | | + |
| *Euphilotes rita coloradensis* | Colorado blue | | | X | | | X | | | |
| *Euphilotes rita emmeli* | Desert buckwheat blue | X | | | | | X | | | |

Table 4. Insects - status of species of greatest conservation need. Given the absence of data on insects, the collective judgment of the panel of Science Forum experts is denoted with an "X" (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Euphilotes spaldingi* | Spalding's blue | | X | | | | X | | | |
| *Eurystrymon favonius Ontario* | Northern hairstreak | X | | | | | X | | | |
| *Incisalia fotis* | Early elfin | | X | | | | X | | | |
| **Brush-footed Butterflies** | | | | | | | | | | |
| *Boloria improba acrochema* [2/] | Uncompahgre fritillary | X | | | | | X | | | + |
| *Speyeria idalia* | Regal fritillary | X | | | | X | | | | |
| *Speyeria nokomis nokomis* | Great Basin silverspot butterfly | X | | | | X | | | | |
| **Satyrids** | | | | | | | | | | |
| *Agapema homogena* | Rocky Mountain Agapema | | | | X | | | | X | |
| *Anisota oslari* | Oslar's oakworm moth | | | | X | | | | X | |
| *Coloradia luski* | Lusk's Pinemoth | | | | X | | | | X | |
| *Hemileuca neumoegeni* | A Buckmoth | | | | X | | | | X | |
| **Sphinx moths** | | | | | | | | | | |
| *Euproserpinus wiesti* | Wiest's sphinx moth | X | | | | | | | X | |
| *Proserpinus flavofasciata* | Yellow-banded day sphinx | | | | X | | | | X | |
| *Sagenosoma elsa* | A sphinx moth | | | | X | | | | X | |

Table 4. Insects - status of species of greatest conservation need. Given the absence of data on insects, the collective judgment of the panel of Science Forum experts is denoted with an "X" (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |

* At the Science Forum, panels were also charged with identifying the species within each taxonomic grouping where they had higher concerns for that species.
[1/] Added at the Science Forum.
[2/] Added after public involvement. The population status and trends taken from: Fish and Wildlife Service. 1994. Uncompahgre fritillary butterfly recovery plan. Denver, CO. 20pp.

Table 5. Mollusks - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Acroloxus coloradensis* | Rocky Mountain capshell | D | | | | | | | X | + |
| *Anodontoides ferussacianus* | Cylindrical papershell | X | | | | X | | | | + |
| *Ferrissia fragilis* | | X | | | | X | | | | + |
| *Ferrissia walkeri* | | X | | | | X | | | | + |
| *Physa cupreonitens* | Hot Springs Physa | X | | | | | | | X | + |
| *Physa utahensis* | Banded Physa | X | | | | | | | X | + |
| *Promenetus exacuous* | | X | | | | X | | | | + |
| *Promenetus umbillicatellus* | | X | | | | X | | | | + |
| *Uniomerus tetralasmus* | Pondhorn | X | | | | | | | X | + |

* At the Science Forum, panels were also charged with identifying the species within each taxonomic grouping where they had higher concerns for that species.

Table 6. Fish - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| **Sunfishes** | | | | | | | | | | |
| *Lepomis humilis* | Orangespotted sunfish | | D | | | D | | | | |
| **Catfishes** | | | | | | | | | | |
| *Noturus flavus* | Stonecat | D | | | | | | | X | |
| **Perch** | | | | | | | | | | |
| *Etheostoma cragini* | Arkansas darter | | D | | | | D | | | |
| *Etheostoma exile* | Iowa darter | | D | | | | D | | | |
| *Etheostoma spectabile* | Plains orangethroat darter | D | | | | D | | | | + |
| **Suckers** | | | | | | | | | | |
| *Catostomus discobolus* | Bluehead sucker | | D | | | | | | X | |
| *Catostomus latipinnis* | Flannelmouth sucker | | D | | | | | | X | |
| *Catostomus playtrhynchus* | Mountain sucker | | | | X | | | | X | |
| *Catostomus plebeius* | Rio Grande sucker | D | | | | | | D | | |
| *Xyrauchen texanus* | Razorback Sucker | D | | | | | | D | | + |
| **Minnows** | | | | | | | | | | |

Table 6. Fish - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Gila elegans* | Bonytail | D | | | | | | D | | + |
| *Ptychocheilus lucius* | Colorado Pikeminnow | | D | | | D | | | | + |
| *Hybognathus hankinsoni* | Brassy minnow | D | | | | | | | X | + |
| *Luxilus cornutus* | Common shiner | | D | | | | D | | | |
| *Platygobio gracilus* | Flathead chub | | | D | | | D | | | |
| *Gila cypha* | Humpback chub | D | | | | D | | | | + |
| *Couesius plumbeus* | Lake chub | | D | | | | D | | | |
| *Hybognathus placitus* | Plains minnow | D | | | | | | | X | + |
| *Phoxinus eos* | Northern Redbelly Dace | D | | | | | D | | | |
| *Gila pandora* | Rio Grande chub | | D | | | | D | | | |
| *Gila robusta* | Roundtail chub | | D | | | D | | | | |
| *Phoxinus erythrogaster* | Southern Redbelly Dace | D | | | | | D | | | |
| *Phenacobius mirabilis* | Suckermouth minnow | D | | | | | D | | | + |
| **Trout** | | | | | | | | | | |
| *Oncorhynchus clarki pleuriticus* | Colorado River Cutthroat Trout | | D | | | | | D | | |

Table 6. Fish - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Oncorhynchus clarki stomias* | Greenback Cutthroat Trout | | D | | | | | D | | + |
| *Oncorhynchus clarki virginalis* | Rio Grande Cutthroat Trout | | D | | | | | D | | |

* At the Science Forum, panels were also charged with identifying the species within each taxonomic grouping where they had higher concerns for that species.

Table 7. Amphibians - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| **Toads** | | | | | | | | | | |
| *Scaphiopus couchii* | Couch's spadefoot | | X | | | | X | | | |
| *Bufo boreas boreas* | Boreal toad (Southern Rocky Mountain Population) | D | | | | | D [1/] | | | + |
| *Bufo debilis* | Green toad | | | | X | | | | X | |
| **Frogs** | | | | | | | | | | |
| *Acris crepitans* | Northern cricket frog | D | | | | D | | | | |
| *Hyla arenicolor* | Canyon tree frog | | X | | | | X | | | |
| *Gastrophryne olivacea* | Great Plains narrowmouth toad | | | | X | | | | X | |
| *Rana blairi* | Plains leopard Frog | | X | | | X | | | | + |
| *Rana pipiens* | Northern leopard Frog | X | | | | X | | | | + |
| *Rana sylvatica* | Wood Frog | | D | | | | D | | | |

* At the Science Forum, panels were also charged with identifying the species within each taxonomic grouping where they had higher concerns for that species.

[1/] Based on number of breeding sites

Table 8. Reptiles - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| **Turtles** | | | | | | | | | | |
| *Kinosternon flavescens* | Yellow mud turtle | X | | | | | | | X | + |
| **Lizards** | | | | | | | | | | |
| *Gambelia wislizenii* | Longnose leopard lizard | X | | | | | X | | | |
| *Phrynosoma cornutum* | Texas horned lizard | | D | | | | X | | | + |
| *Phrynosoma modestum* | Roundtail horned lizard | | | | X | | | | X | |
| *Cnemidophorus neotesselatus* | Triploid checkered whiptail | | X | | | | X | | | + |
| **Snakes** | | | | | | | | | | |
| *Leptotyphlops dulcis* | Texas blind snake | | | | X | | | | X | |
| *Hypsiglena torquata* | Night snake | X | | | | | | | X | |
| *Lampropeltis getula* | Common kingsnake | X | | | | | | | X | |
| *Rhinocheilus lecontei* | Long-nosed snake | X | | | | | | | X | |
| *Tantilla horbartsmIthi* | Southwestern black-headed snake | | | | X | | | | X | |

Table 8. Reptiles - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Thamnophis cyrtopsis* | Blacknecked garter snake | X | | | | | | | X | |
| *Thamnophis sirtalis* | Common garter snake | | X | | | X | | | | + |
| *Crotalus viridis concolor* | Midget faded rattlesnake | | | | X | | | | X | |
| *Sistrurus catenatus* | Massasauga | | D | | | | D | | | + |

* At the Science Forum, panels were also charged with identifying the species within each taxonomic grouping where they had higher concerns for that species.

Table 9. Birds - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| **Grebes** | | | | | | | | | | |
| *Podiceps nigricollis* | Eared grebe | D | | | | | | | X | |
| *Aechmophorus occidentalis* | Western grebe | D | | | | | D | | | |
| **Pelicans** | | | | | | | | | | |
| *Pelecanus erythrorhynchos* | American white pelican | D | | | | | D | | | |
| **Herons** | | | | | | | | | | |
| *Botaurus lentiginosus* | American bittern | | | | X | | | | X | + |
| *Egretta thula* | Snowy egret | D | | | | | D | | | |
| *Plegadis chihi* | White-faced ibis | D | | | | | | D | | |
| **Swans, Geese, and Ducks** | | | | | | | | | | |
| *Anas acuta* | Northern pintail | D | | | | | D | | | |
| *Aythya affinis* | Lesser scaup | | D | | | | D | | | |
| *Bucephala islandica* | Barrow's goldeneye | D | | | | | D | | | |
| **Kites, Eagles, and Hawks** | | | | | | | | | | |
| *Pandion haliaetus* | Osprey | D | | | | | | D | | |
| *Haliaeetus leucocephalus* | Bald eagle | D | | | | | | D | | + |
| *Circus cyaneus* | Northern harrier | | D | | | | D | | | |
| *Accipiter gentilis* | Northern goshawk | | | | X | | | | X | + |

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| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Buteo swainsoni* | Swainson's hawk | | D | | | D | | | | + |
| *Buteo regalis* | Ferruginous hawk | D | | | | | D | | | + |
| *Aquila chrysaetos* | Golden eagle | | X | | | | D | | | + |
| **Falcons** | | | | | | | | | | |
| *Falco peregrinus anatum* | American peregrine falcon | | D | | | | | D | | + |
| *Falco mexicanus* | Prairie falcon | | D | | | | | | X | + |
| **Partridges, Grouse, Turkeys, and Quail** | | | | | | | | | | |
| *Centrocercus urophasianus* | Greater sage-grouse | | D | | | | D | | | + |
| *Centrocercus minimus* | Gunnison sage-grouse | D | | | | D | | | | + |
| *Lagopus leucurus* | White-tailed ptarmigan | | D | | | | D | | | |
| *Tympanuchus cupido* | Greater prairie-chicken | | D | | | | D | | | + |
| *Dendragapus obscurus* | Blue grouse | | D | | | | D | | | |
| *Tympanuchus phasianellus columbianus* | Columbian sharp-tailed grouse | | D | | | | D | | | |
| *Tympanuchus phasianellus jamesii* | Plains sharp-tailed grouse | D | | | | | | | X | + |
| *Tympanuchus pallidicinctus* | Lesser prairie-chicken | D | | | | | | D | | + |

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| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Callipepla squamata* | Scaled quail | | D | | | | D | | | + |
| **Rails, Gallinules, and Coots** | | | | | | | | | | |
| *Laterallus jamaicensis* | Black rail | D | | | | | | | X | |
| **Cranes** | | | | | | | | | | |
| *Grus canadensis tabida* | Greater sandhill crane | | D | | | | D | | | |
| *Grus americana* | Whooping crane | Not known to have breeding population in Colorado | | | | | | | | |
| **Plovers** | | | | | | | | | | |
| *Charadrius alexandrinus nivosus* | Western snowy plover | D | | | | | | | X | |
| *Charadrius melodus* | Piping plover | D | | | | | D | | | |
| *Charadrius montanus* | Mountain plover | D | | | | | D | | | + |
| **Sandpipers and Phalaropes** | | | | | | | | | | |
| *Bartramia longicauda* | Upland sandpiper | D | | | | | | | X | + |
| *Numenius americanus* | Long-billed curlew | D | | | | | D | | | + |
| *Limosa fedoa* | Marbled godwit | D | | | | | | | X | |
| *Phalaropus tricolor* | Wilson's phalarope | | D | | | | | | X | |
| **Jaegers, Gulls, and Terns** | | | | | | | | | | |

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| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Sterna forsteri* | Forster's tern | D | | | | | D | | | |
| *Sterna antillarum* | Least tern | D | | | | | D | | | |
| **Pigeons and Doves** | | | | | | | | | | |
| *Patagioenas fasciata* | Band-tailed pigeon | D | | | | | | | X | + |
| **Cuckoos, Roadrunners, and Anis** | | | | | | | | | | |
| *Coccyzus americanus* | Western yellow-billed cuckoo | D | | | | | | | X | + |
| **Owls** | | | | | | | | | | |
| *Athene cunicularia hypugaea*[1/] | Western burrowing owl | | D | | | | D | | | + |
| *Otus flammeolus* | Flammulated owl | | | | X | | | | X | + |
| *Strix occidentalis lucida* | Mexican spotted owl | D | | | | | | | X | + |
| *Asio flammeus* | Short-eared owl | D | | | | D | | | | + |
| *Aegolius funereus*[2/] | Boreal owl | | | | X | | | | X | + |
| **Swifts** | | | | | | | | | | |
| *Cypseloides niger* | Black swift | D | | | | | D | | | |
| *Aeronautes saxatalis* | White-throated swift | | X | | | | D | | | |
| **Hummingbirds** | | | | | | | | | | |
| *Archilochus alexandri* | Black-chinned hummingbird | | X | | | | | | X | |
| *Selasphorus platycercus* | Broad-tailed hummingbird | | | D | | | D | | | |

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| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Selasphorus rufus* | Rufous hummingbird | | D | | | | | | X | |
| **Woodpeckers** | | | | | | | | | | |
| *Melanerpes lewis* | Lewis's woodpecker | | D | | | X | | | | + |
| *Sphyrapicus thyroideus* | Williamson's sapsucker | | D | | | | D | | | + |
| *Sphyrapicus nuchalis* | Red-naped sapsucker | | D | | | | X | | | + |
| *Picoides dorsalis* | American three-toed woodpecker | D | | | | | | | X | |
| **Flycatchers** | | | | | | | | | | |
| *Contopus cooperi* | Olive-sided flycatcher | | D | | | | | | X | + |
| *Empidonax trailli extimus* | Southwestern willow flycatcher | D | | | | | D | | | + |
| *Empidonax wrightii* | Gray flycatcher | | D | | | | X | | | |
| *Empidonax oberholseri* | Dusky flycatcher | | | D | | | X | | | |
| *Empidonax occidentalis* | Cordilleran flycatcher | | D | | | | X | | | |
| **Shrikes** | | | | | | | | | | |
| *Lanius ludovicianus* | Loggerhead shrike | | D | | | | D | | | + |
| **Vireos** | | | | | | | | | | |
| *Vireo vicinior* | Gray vireo | D | | | | | | | X | + |
| **Jays, Magpies, and Crows** | | | | | | | | | | |

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| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Gymnorhinus cyanocephalus* | Pinyon jay | | D | | | D | | | | + |
| **Swallows** | | | | | | | | | | |
| *Progne subis hesperia* | Western purple Martin | D | | | | | | | X | + |
| **Chickadees and Titmice** | | | | | | | | | | |
| *Baeolophus ridgwayi* | Juniper titmouse | | D | | | D | | | | + |
| **Nuthatches** | | | | | | | | | | |
| *Sitta pygmaea* | Pygmy nuthatch | | D | | | | X | | | |
| **Dippers** | | | | | | | | | | |
| *Cinclus mexicanus* | American dipper | | D | | | | | | X | |
| **Kinglets, Gnatcatchers, and Thrushes** | | | | | | | | | | |
| *Catharus fuscecens* | Veery | D | | | | | | | X | |
| *Toxostoma curvirostre* | Curve-billed thrasher | D | | | | | | | X | |
| **Wood-Warblers** | | | | | | | | | | |
| *Vermivora virginiae* | Virginia's warbler | | D | | | | D | | | |
| *Dendroica nigrescens* | Black-throated gray warbler | | D | | | | | | X | + |
| *Dendroica graciae* | Grace's warbler | D | | | | | | | X | |
| **New World Sparrows** | | | | | | | | | | |
| *Aimophila cassinii* | Cassin's sparrow | | X | | | X | | | | + |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Spizella breweri* | Brewer's sparrow | | | D | | D | | | | + |
| *Amphispiza belli* | Sage sparrow | | X | | | X | | | | + |
| *Calamospiza melanocorys* | Lark bunting | D | | | | D | | | | + |
| *Pooecetes gramineus* | Vesper sparrow | | D | | | | D | | | |
| *Zonotrichia querula* | Harris' sparrow | D | | | | | | | X | |
| *Calcarius mccownii* | McCown's longspur | D | | | | | | | X | + |
| *Calcarius ornatus* | Chestnut-collared longspur | D | | | | | | | X | |
| **Grosbeaks and Buntings** | | | | | | | | | | |
| *Passerina amoena* | Lazuli bunting | | D | | | D | | | | |
| **Blackbirds and Orioles** | | | | | | | | | | |
| *Dolichonyx oryzivorus* | Bobolink | D | | | | | D | | | + |
| **Finches** | | | | | | | | | | |
| *Leucosticte atrata* | Black rosy-finch | D | | | | | | | X | |
| *Leucosticte australis* | Brown-capped rosy-finch | | D | | | | | | X | + |
| *Coccothraustes vespertinus* | Evening grosbeak | | D | | | | | | X | |
| *Carpodacus cassinii* | Cassin's finch | | D | | | D | | | | |
| *Loxia curvirostra* | Red crossbill | | D | | | | | | X | |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |

* At the Science Forum, panels were also charged with identifying the species within each taxonomic grouping where they had higher concerns for that species.

[1/]. Division of Wildlife staff reported at the second round of stakeholder meetings that the USDA Forest Service should have some unpublished information from a nest box program.

[2/] Division of Wildlife staff reported at the second round of stakeholder meetings that there may be a difference between the East side (stable populations) and West side (declining populations) of the state

Table 10. Mammals - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| **Shrews** | | | | | | | | | | |
| *Sorex nanus* | Dwarf shrew | | | | X | | | | X | + |
| *Sorex preblei* | Preble's shrew | | | | X | | | | X | |
| **Bats** | | | | | | | | | | |
| *Euderma maculatum* | Spotted bat | D | | | | | D | | | + |
| *Idionycteris phyllotis* | Allen's big-eared bat | | | | X | | | | X | |
| *Myotis occultus* | Arizona myotis | | | | X | | | | X | |
| *Myotis thysanodes* | Fringed myotis | D | | | | | | | X | + |
| *Plecotus (Choynorhinus) townsendii pallescens* | Townsend's big-eared bat ssp. | D | | | | | | | X | + |
| **Rabbits and Hares** | | | | | | | | | | |
| *Lepus townsendii* | White-tailed jackrabbit | | X | | | | | | X | + |
| **Squirrels** | | | | | | | | | | |
| *Cynomys gunnisoni* | Gunnison's prairie dog | | X | | | X | | | | + |
| *Cynomys leucurus* | White-tailed prairie dog | | X | | | | X | | | + |
| *Cynomys ludovicianus* | Black-tailed prairie dog | | D | | | | D | | | + |

Table 10. Mammals - status of species of greatest conservation need. When, in the judgment of the Colorado Division of Wildlife scientific staff, data exist that reflects upon the status of a species the letter "D" is used. When data are absent, the collective judgment of the panel of Science Forum experts is denoted with an "X". In both cases the judgments expressed in this table are those that emerged from the Science Forum (except when noted by footnotes).

| Scientific Name | Common Name | Population Status as of March 2005 | | | | Population Trend as of March 2005 | | | | Science Forum Species of Most Concern* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| **Pocket Gophers** | | | | | | | | | | |
| *Thomomys bottae rubidus* | Botta's pocket gopher (rubidus ssp) | | X | | | | | | X | |
| *Thomomys talpoides macrotis* | Northern pocket gopher (macrotis ssp) | | X | | | X | | | | |
| *Perognathus fasciatus* | Olive-backed pocket mouse | X | | | | X | | | | + |
| **Jumping Mice** | | | | | | | | | | |
| *Zapus hudsonius* | Meadow jumping mouse (both subspecies) | X | | | | X | | | | + |
| **Dogs and Allies** | | | | | | | | | | |
| *Canis lupus* | Gray wolf - two subspecies (Northern and Mexican) | Wild populations extirpated. See Gray Wolf Management Plan;: http://wildlife.state.co.us/species_cons/GrayWolf/. | | | | | | | | + |
| *Vulpes macrotis* | Kit fox | D | | | | D | | | | + |
| *Vulpes velox* | Swift fox | | D | | | | D | | | |
| **Bears** | | | | | | | | | | |
| *Ursus arctos* | Grizzly bear | Not known in Colorado since 1979 | | | | | | | | |
| **Weasels and Allies** | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Medium | Abundant | Unknown | Declining | Stable | Increasing | Unknown | |
| *Conepatus leuconotus* | Common Hog-nosed skunk | | | | X | | | | X | |
| *Gulo gulo* | Wolverine | | | | X | | | | X | |
| *Lontra canadensis* | River otter | D | | | | | | D | | |
| *Mustela nigripes* | Black-footed ferret | D | | | | | | | X | + |
| **Cattle and Allies** | | | | | | | | | | |
| *Bison bison* | Bison | Wild populations extirpated. Classified as domestic species by Wildlife Commission Regulation – Ch. 11, Art. II, Sct 1103 A. | | | | | | | | |
| *Ovis canadensis* | Bighorn sheep | | D | | | | D | | | |
| **Cats** | | | | | | | | | | |
| *Lynx canadensis* | Lynx | D | | | | | | D | | + |

* At the Science Forum, panels were also charged with identifying the species within each taxonomic grouping where they had higher concerns for that species.

## F. Key Habitats and Relative Conditions for Species of Greatest Conservation Need

While this CWCS began with an assessment of individual species as a way to identify the species of greatest conservation need, potential management interventions, expressed here as 'potential actions', tended to focus on habitat management solutions. While the panels of experts at the Science Forum provided their judgement of species-habitat associations (Appendix C), the State of Colorado also has detailed habitat requirement descriptions for many species and has completed considerable work cataloging habitat associations and habitat status assessments for wildlife. These include:

| | |
|---|---|
| Colorado Gap Analysis (Schrupp, et. al 2000) | 585 Species (Modeled Distribution) http://ndis1.nrel.colostate.edu/cogap/ |
| Colorado SW-ReGap | 578 Colorado Species (854 species total) (Modeled Distribution) (web site under development, due Oct 1 2005) http://fws-nmcfwru.nmsu.edu/swregap/ |
| CDOW/SAM Mapping | 45 Species (Mapped Data –Economic Importance, T&E species) http://ndis.nrel.colostate.edu/ftp/ftp_response.asp |
| Colorado Vegetation Classification ("Basinwide") | Habitat Evaluation http://ndis.nrel.colostate.edu/ftp/ftp_response.asp#Veg |
| Riparian Mapping Project | Habitat Evaluation http://ndis1.nrel.colostate.edu/riparian/riparian.htm |
| COVERS Ranking Project (Melcher et al. 2001) | 630 Species (Status Assessment) (unavailable online) |
| Additional examples include the Colorado Natural Heritage Program http://www.cnhp.colostate.edu/site_map.html , part of a global network of more than eighty conservation data centers and programs associated with NatureServe. | |

The 41 land cover types used for this CWCS are from the Colorado GAP Analysis (Schrupp et al. 2000), with the exception of the "lakes" category which was added at the request of Science Forum participants (Table 11 & Fig.2). In many cases, few data exist that allow an assessment of these land cover types relative to their ability to support native wildlife (i.e., "condition"). To bridge that gap, the CWCS relied heavily upon the judgment of the panels of scientists to assess those relative habitat conditions (Appendix B).

Those panels as well as interested publics encouraged a more integrative, landscape-level view of the 41 types to address their interrelatedness. Following this approach, and pooling across all taxonomic groupings demonstrated that the landscape of eastern Colorado - eastern plains river and stream systems (including riparian), tallgrass and midgrass prairie – was judged as being in the poorest condition to support native species, followed by sagebrush, and pinyon-juniper and ponderosa pine. Other land cover types were considered adequate or good for at

least half their associated taxonomic groupings. The greatest proportion of land cover types assessed as "poor" occurred for birds, with roughly one-quarter of the land cover types receiving that assessment (Appendix B). Perhaps of even greater concern, given the longer-range perspective of the Strategy, was that trends in habitat conditions were judged to be declining in most land cover types across all taxa, with the notable exceptions ("stable") tending to be in the higher elevation streams and forested lands and in agricultural croplands (Table 11).

Table 11. Relative condition of key habitats in Colorado as assessed by panels of scientists at the March, 2005, Science Forum

| Habitat Category | Land Cover Type | Habitat Condition Status: Number of Taxonomic Groupings Affected ($n_{max}$-=6) | | | | Habitat Condition Trend: Number of Taxonomic Groupings Affected ($n_{max}$=6) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Urban and Croplands | Urban | 1 | 1 | | 1 | | | 3 | |
| | Dryland Crops | | 1 | | 2 | | 2 | | 1 |
| | Irrigated Crops | | 1 | | 2 | 1 | 1 | | 1 |
| Riparian / Wetlands | Open Water | | 6 | | | 1 | 5 | | |
| | Shrub-dominated Wetlands | | 5 | | 1 | 6 | | | |
| | Grass/Forb Dominated Wetlands | | 4 | | 2 | 6 | | | |
| | Eastern Plains Rivers | 6 | | | | 6 | | | |
| | Eastern Plains Streams | 5 | 1 | | | 6 | | | |
| | Transition Streams | 2 | 4 | | | 5 | 1 | | |
| | Mountain Streams | | 6 | | | | 6 | | |
| | West Slope Rivers | 1 | 4 | | 1 | 5 | | | 1 |
| | West Slope Streams | 1 | 4 | | 1 | 4 | 1 | | 1 |
| | Playas | 1 | 1 | | 2 | 3 | 1 | | |
| Grasslands | Tallgrass Prairie | 2 | 1 | | | 3 | | | |
| | Midgrass Prairie | 2 | 1 | | 1 | 3 | | | 1 |
| | Shortgrass Prairie | | 4 | | | 4 | | | |
| | Foothill / Mountain Grassland | | 3 | | | 3 | | | |
| | Sand Dune Complex (Grassland) | 1 | 1 | | 1 | 1 | | | 2 |
| Shrublands | Upland Shrub | | 2 | | 1 | 2 | | | 1 |
| | Deciduous Oak | | 3 | | | 1 | 2 | | |
| | Sagebrush | 3 | 1 | | | 3 | 1 | | |

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| Habitat Category | Land Cover Type | Habitat Condition Status: Number of Taxonomic Groupings Affected ($n_{max}$-=6) | | | | Habitat Condition Trend: Number of Taxonomic Groupings Affected ($n_{max}$=6) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| | Desert Shrub | | 4 | | | 1 | 1 | | 2 |
| | Saltbrush Fans & Flats | | 4 | | | 1 | 3 | | |
| | Greasewood Fans & Flats | 1 | 2 | | 1 | 1 | 2 | | 1 |
| | Sand Dune Complex (Shrubland) | | 1 | | 2 | 1 | | | 2 |
| Forestlands | Aspen Forest | | 4 | | | 2 | 1 | | 1 |
| | Spruce-Fir | | 2 | | 2 | 1 | 2 | | 1 |
| | Douglas Fir | | 3 | | | 1 | 2 | | |
| | Lodgepole Pine | | 1 | 1 | 2 | | 2 | | 2 |
| | Limber Pine | | 1 | 1 | 1 | | 2 | | 1 |
| | Ponderosa Pine | 2 | 1 | | | 2 | 1 | | |
| | White Fir | | 2 | | 1 | | 1 | 1 | 1 |
| | Pinyon-Juniper | 2 | 1 | | | 2 | 1 | | |
| | Rocky Mountain Bristlecone Pine | | 2 | | 1 | | 2 | | 1 |
| | Mixed Conifer | | 2 | | 2 | | 3 | | 1 |
| | Mixed Forest | | | | 3 | | | | 3 |
| Tundra | Shrub Tundra | | 2 | | 1 | | 2 | | 1 |
| | Meadow Tundra | | 2 | | 1 | | 1 | 1 | 1 |
| Unvegetated | Sandy Areas | | 1 | 1 | 2 | | 2 | | 2 |
| | Exposed Rock | | 1 | 1 | 1 | | 2 | | 1 |
| Lakes | Added at Science Forum (Fish) | | 1 | | | | 1 | | |

Location of Habitats in Colorado

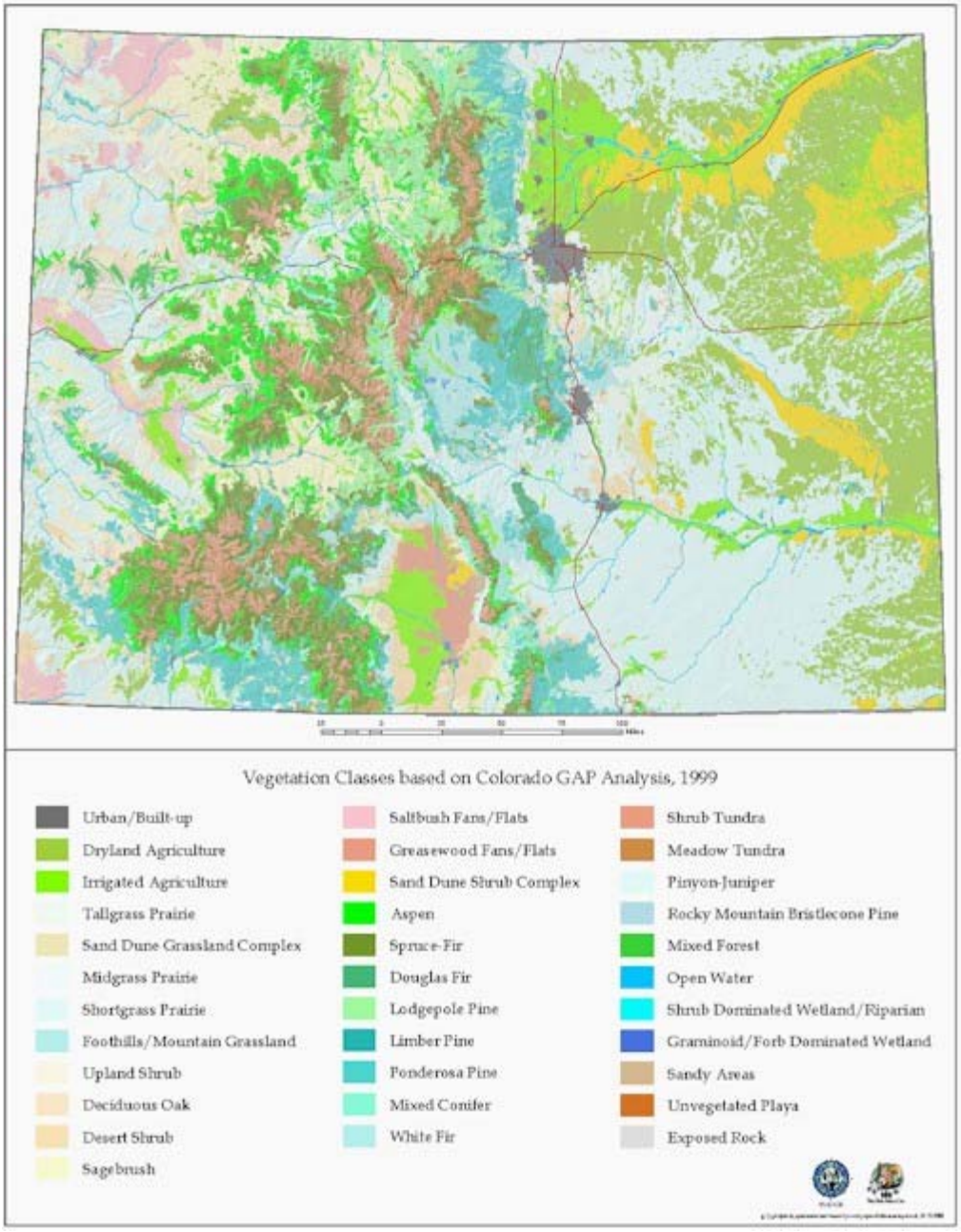


Figure 2. Vegetative communities and habitat types in Colorado's CWCS.

## G. Problems Affecting Species of Concern and their Habitats

Colorado's geographical latitude and the variations in elevation– from 3,500 feet to over 14,300 feet– provide a wide variety of habitats for wildlife. Across this geography there are a variety of 'life-zones'– the prairies, foothills, montane, subalpine, and alpine– resulting in many land forms and accompanying vegetative environments. Since pre-settlement times, this landscape has changed dramatically from a rapidly increasing human presence. For example, the population of Colorado grew from 1.8 million in 1960 to 4.3 million in 2000[6], and developed acres nearly doubled between 1970 and 2000 (Colorado Conservation Trust 2005). Modeled projections for future population growth and development indicate >50% population growth, and development of > 1 million more acres in Colorado through the year 2030, (Colorado Conservation Trust 2005).

We asked the experts to look at the landscapes as they exist today, evaluate their condition for key species of greatest conservation need, and suggest problems, issues, and/or threats that if addressed would make meaningful improvements to benefit those particular species. The following table summarizes the major themes that emerged from the Technical Questionnaire and Science forum concerning threats to the status and needs of the various species groups in Colorado. Appendix B presents the detailed evaluations associated with each taxonomic group from which these themes were extracted.

Table 12. Key Issues Affecting the Future of Wildlife in Colorado
All Taxonomic Groupings. Issues specific to taxonomic groups and habitat types are presented below this table.

| Kind of Issue | Kind of Activity Most Frequently Mentioned |
|---|---|
| ***Organizational capacity, management, and information gaps*** – coordination, funding, lack of common goals, confused or gaps in authorities, etc. | Information fragmentation - of population and habitat objectives, data, and effort/accountability among multiple organizations; too-severe constraints on funding, workforce |
| ***Habitat Conversion*** - Intentional conversion of natural habitat usually affecting wildlife by causing displacement and/or loss or degradation of wildlife habitat. | Housing, urban, and "ex-urban" development |
| | Agricultural operations |
| | Recreation area developments |
| | Water storage |
| ***Transportation and Infrastructure*** - Development of corridors/passages for transportation, pipelines, communication structures, etc. usually affecting wildlife by increasing wildlife mortality and fragmentation of wildlife habitat. | Roads |
| | Railroads |
| | Overhead utility lines and towers |
| ***Resource Extraction*** – Extraction of rock, | Drilling |

[6] Source: U.S. Census Bureau, http://www.census.gov/population/cencounts/co190090.txt and http://factfinder.census.gov/servlet/QTTable?_bm=n&_lang=en&qr_name=DEC_2000_SF1_U_DP1&ds_name=DEC_2000_SF1_U&geo_id=04000US08. Accessed June 17, 2005.

Table 12. Key Issues Affecting the Future of Wildlife in Colorado
All Taxonomic Groupings. Issues specific to taxonomic groups and habitat types are presented below this table.

| | |
|---|---|
| minerals, metals, fuels, and water, etc. usually affecting wildlife by displacing species, lowering carrying capacity of the habitat, and contamination issues. | Mining |
| | Water use, management |
| ***Consumptive Use of Biological Resources*** – Harvest or use of plant and animal populations usually affecting wildlife by direct negative impact, altering wildlife distribution and fitness, or ecosystem processes. (Note: Throughout this document, the terms "grazing" and "grazing management" may refer to both wild and domestic animals unless specifically noted otherwise.) | Forest and woodland management |
| | Grazing |
| ***Non-consumptive Resource Use*** – Wildlife viewing, alternative recreation on the land such as snowmobiling, etc. usually affecting wildlife by displacing wildlife, disturbance to herds and sensitive species, etc. | Motor-powered recreation |
| | Non-motorized recreation |
| ***Pollution*** - Introduction and spread of unwanted matter and energy into ecosystems from point and non-point sources that usually affects wildlife by causing increased direct mortality of wildlife and degradation of their habitats and available forage. | Chemicals and toxins |
| | Nutrient loads |
| | Solid waste |
| | Waste or residual materials |
| ***Invasive, Exotic Species*** - Introduction and/or spread of unwanted exotic organisms into ecosystems that usually affects wildlife by increasing competition, reducing habitat, or otherwise reducing the welfare of native species. | Invasive plants |
| | Invasive animals |
| | Pathogens |
| | Introduced genetic material |
| ***Changes in Ecological Processes*** - Alteration of ecological processes outside of the natural range of a species ability to adapt usually caused by large-scale habitat modifications such as water table reductions, etc. | Water over-allocation (e.g., de-watering streams) |
| | Septic system failures |
| | Riparian area deforestation |
| *Credit – we are grateful to the Arizona Game and Fish Department for providing this format from their CWCS that is parallel to our findings.* | |

Participants at the Science Forum identified the key habitats for the subset of species in each taxonomic grouping for which they had greatest concerns (see Tables 4 - 10). They then provided the following evaluations (threats and potential actions) of those habitats. Further insight was gained from the stakeholder meetings and these were added using *italic* text.

**Mollusks.** Assessment of key landcover types (Science Forum Results). Round 2 Stakeholder input in italics.

- Grass/Forbs Wetlands
  - Threat: Water quality (e.g., grazing impacts, agricultural chemicals)
    - Potential actions: Identify non-point source pollution and control / isolate impacts. Better monitoring and enforcement of point source pollution. Identify new pollutants and develop proactive standards. Management of grazing; fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
  - Threat: Conversion to agricultural or development
    - Potential actions: Land protection (easements / purchase; fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc) County-level land use management and protection.
  - Threat: Maintaining functionality of hydrology (e.g., deforestation, grazing management)
    - Potential actions: Grazing management. Logging management. Water diversion management.
- Lakes
  - Threat: Water quality
    - Potential actions: Identify non-point source pollution and control / isolate impacts. Better monitoring and enforcement of point source pollution. Identify new pollutants and develop proactive standards. Management of grazing. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc).
  - Threat: Water level fluctuations
    - Potential actions: Reservoir level management to promote natural flow patterns. Leasing / buying water rights. Increased efficiency of water use.
  - Threat: Land use surrounding lakes
    - Potential actions: Manage recreation use. County-level land use management. Lake-shore buffer zones. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
- Eastern Plains streams
  - Threat: Water quality
    - Potential actions: Identify non-point source pollution and control / isolate impacts. Better monitoring and enforcement of point source pollution. Identify new pollutants and develop proactive standards. Management of grazing; fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc).
  - Threat: Quantity of water flow (timing)
    - Potential actions: Maintaining natural instream flows. Leasing / buying water rights.
  - Threat: Riparian land use
    - Potential actions: Maintain buffer zones. Grazing management (to maintain water quality). Recreation management (to control sedimentation). Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
  - Threat: Invasive plant species
    - Potential actions: Regulate use of ornamental species. Control invasive exotic species. Restoration of native plant species.

**Invertebrates** (insects and arachnids combined). Assessment of key landcover types (Science Forum Results).

- Eastern Plains streams
- Transition streams (e.g., Little Thompson)
- West Slope streams (rivers, canyon streams, not high elevation, e.g., Colorado River) (Yampa and Dolores, not impacted)
- High Plains steppe lands (Eastern Plains) (all grass types, short-, mid-, and tall grass plains)
- Greasewood fans and flats

  Threats (combined for the land cover types listed above):
  - Threat: Water quality
  - Threat: Water quantity
  - *Threat: Unclear management authority (especially for insects and spiders)*

    Potential actions (combined for the threats listed above)
    - Maintain natural hydrological cycles
    - Maintain natural burn cycles
    - Restore grasslands
    - Conservation easements
    - Open space / GOCO / land trusts (acquisitions)
    - Maintain linkages and connectivity
    - Grazing management
    - Prevent fragmentation
    - Control or eliminate invasive plants and insects

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**Reptiles and Amphibians.** Assessment of key landcover types (Science Forum Results). Round 2 Stakeholder input in italics.

- Shortgrass prairie
  - Threats: Conversion, fragmentation, invasive exotic species, urbanization, and roadways.
    - Potential actions: Re-vegetation, conservation easements, fee title acquisition, landowner incentives, habitat conservation in wildlife corridors, *crossings*, control or eliminate invasive exotic species, education, mitigation, and burn prescriptions. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
- Open water (especially for Boreal toads and Northern leopard frogs)
  - Threats: Water quality, recreation, invasive exotic species (plants and animals), diversions, over utilization, livestock overuse, drought, and point and non-point source pollution.
    - Potential actions: Conservation easements, land owner incentives, water conservation (voluntary and regulatory), growth management, control or eliminate invasive exotic species, exclosures, education, and mitigation.
- Shrub dominated wetlands
  - Threats: Invasive exotic species (Tamarisk issues), water quality, drainage conversion, drought, fire suppression, livestock overuse, point source and non-point source pollution, fragmentation, and recreation.
    - Potential actions: Re-vegetation, control or eliminate invasive exotic species, conservation easements, land owner incentives, water conservation, growth management, exclosures, education, and mitigation. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
- Grass / forbs dominated wetlands
  - Threats: Invasive exotic species (Tamarisk issues), water quality, drainage conversion, drought, fire suppression, livestock overuse, point source and non-point source pollution, fragmentation, and recreation.
    - Potential actions: Re-vegetation, control or eliminate invasive exotic species, conservation easements, land owner incentives, water conservation, growth management, exclosures, education, and mitigation. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
- Sagebrush (sand sage and big sage land cover types)

    - Threats: Conversion, fragmentation, invasive exotic species, urbanization, roadways, and extraction.
        - Potential actions: Conservation easements, re-vegetation, control or eliminate invasive exotic species, fee title acquisition, landowner incentives, education, *habitat conservation in wildlife corridors, wildlife crossings*, and mitigation. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
- Eastern plains rivers
    - Threats: Water quality, recreation, invasive exotic species, diversion, overuse, livestock overuse, drought, point source and non-point source pollution, bank stabilization, channelization, silt load and sedimentation, and flood control.
        - Potential actions: Conservation easements, land owner incentives, water conservation, control or eliminate invasive exotic species, growth management, education, mitigation, exclosures, and minimum flow requirements. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
- Midgrass prairie
    - Threats: Conversion, fragmentation, invasive exotic species, urbanization, and roadways.
        - Potential actions: Burn prescriptions, re-vegetation, conservation easements, fee title acquisition, landowner incentives, habitat conservation in wildlife corridors, control or eliminate invasive exotic species, *wildlife crossings*.

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**Fish**. Assessment of key landcover types (Science Forum Results). Round 2 Stakeholder input in italics.

This Science Forum group defined riparian habitat types as a better way to focus fish conservation efforts.

- Eastern Plains rivers and streams
    - Threat: Maintaining flows (base flow quantity, ground water depletion)
        - Potential actions: Leasing / buying water rights. Managing reservoir water supplies and releases to promote natural flow patterns (BOR or other operators / owners as target group). Increased efficiency of water use (e.g., reducing loss in canals, check dams). Increased precision of ground water measurement.
    - Threat: Water quality (Platte, Arkansas) (ammonium, nitrogen)
        - Potential actions: Identify non-point source pollution and control / isolate these (both agricultural and urban). Better monitoring and enforcement of point source pollution. Identifying new pollutants and developing protective standards.
    - Threat: Riparian land use (overgrazing in riparian areas [mostly stream-associated habitat], agriculture [riparian flood plains conversion to agriculture])
        - Potential actions: Manage grazing. Incentive programs for maintaining riparian areas. Protective buffers for riparian corridors. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
    - Threat: Invasive plant species (e.g., Tamarisk, Russian olive)
        - Potential actions: Regulate use of ornamental species. Control of exotic species. Restoration of native plant species.
    - Threat: Invasive exotic species (e.g., mosquito fish, *bullfrogs, New Zealand mud snail*)
        - Potential actions: Regulate use and importation of non-native fish. Control of invasive exotic species. Restoration of native species.
    - Threat: Instream barriers
        - Potential actions: Remove or notch aesthetic barriers. Utilize natural stream morphology to replace the function of barriers. Provide fish passages.
    - Threat: Change from agriculture to municipal use (e.g., return flow changes)
        - Potential actions: Monitor impacts to the drainage.
    - *Threat: Loss of genetic connection between populations.*

        - Potential actions: Maintain genetic database information on isolated populations to monitor in-breeding status; restore independent movement around instream barriers; translocate between unavoidably isolated populations; provide secure passage across, over or under roadways acting as barriers.
    - *Threat: Selenium contamination in the Arkansas River.*
        - Potential actions: Identify and isolate selenium input sources within immediate drainage via barriers or redirect runoff away from low-flow stream channels or important standing water habitats; reduce irrigation water inputs into selenium-rich soils resulting in return flow of selenium-laden runoff to stream channels.
- Western rivers
    - Threat: Non-native fish predation and competition
        - Potential actions: Regulate use and importation of non-native fish. Control of invasive exotic species. Restoration of native species.
    - Threat: Altered flow patterns
        - Potential actions: Coordinated reservoir operations. *Increased water efficiency.* Leasing / buying water rights. Managing reservoir water supplies and releases to promote natural flow patterns (BOR or other operators / owners as target group). Increased efficiency of water use (e.g., reducing loss in canals, check dams). Increased precision of ground water measurement.
    - *Threat: Water quality*
        - *Potential actions: Identify non-point source pollution and control / isolate these (both agricultural and urban). Better monitoring and enforcement of point source pollution. Identifying new pollutants and developing protective standards.*
    - Threat: Reduced water quantity
        - Potential actions: Coordinated reservoir operations. Increased water efficiency.
    - Threat: Riparian land use
        - Potential actions: Removing / notching dikes to reconnect riparian areas to the river/stream. Leasing / buying riparian areas.
    - Threat: Invasive plant species (e.g., Tamarisk, Russian olive)
        - Potential actions: Regulate use of ornamental species. Control of invasive exotic species. Restoration of native plant species.
    - Threat: Instream barriers
        - Potential actions: Fish passage management. Notching / removing barriers.
    - Threat: Fish loss in irrigation canals
        - Potential actions: Screening irrigation intakes to avoid entrainment.
    - *Threat: Loss of genetic connection between populations.*
        - Potential actions: Maintain genetic database information on isolated populations to monitor in-breeding status; restore independent movement around instream barriers; translocate between unavoidably isolated populations; provide secure passage across, over or under roadways acting as barriers.

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**Birds.** Assessment of key landcover types (Science Forum Results). Round 2 Stakeholder input in italics.

- Eastern Plains rivers
    - Threat: Lack of water because of urban growth
        - Potential actions: Adding wildlife management into water control (dam control, water conservation). Return water flows for downstream use (urban return and wetland recharge). Instream flow water rights. Growth management (urban water conservation management).
    - Threat: Decreased understory, too much understory, lack of regeneration in various riparian areas;
        - Potential actions: Grazing management to benefit wildlife (off-river water sources, stream fencing, and rotation of grazing). Landowner outreach (incentive programs, education). Conservation easements to manage grazing.
    - Threat: Water controls, flow regimes, general water management

        - Potential actions: Adding wildlife management into water control (dam control, water conservation). Return water flows for downstream use (urban return and wetland recharge). Establish/acquire instream flow water rights. Growth management (urban water conservation management). Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
    - Threat: Invasive exotic species (e.g., Russian olive, Tamarisk)
        - Potential actions: Active management (cutting, killing, re-planting). Proper land management (e.g., grazing management); control or eliminate invasive exotic species.
    - Threat: Development along floodplains
        - Potential actions: Land acquisition (e.g., easements). Maintaining (e.g., incentives) for healthy land use (e.g., agriculture practices). Growth management / zoning.
    - Threat: Mineral extraction (gravel)
        - Potential actions: Land acquisition / easements. Maintaining healthy land (e.g., reclamation of land).

- Playas
    - Threat: Tilling
        - Potential actions: *Implementation of* Farm Bill (CP23A). Education. Incentive payments. Playa buffers. Easements.
    - Threat: Pitting (digging holes to drain soil)
        - Potential actions: Hydrologic restoration (e.g., sealing pits). Incentive programs. Education. Easements. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
    - Threat: How to locate 'real' playas
        - Potential actions: Encourage mapping / ground truthing inventories (e.g., RMBO efforts)
    - Threat: Soil erosion and filling-in of playas due to agriculture practices
        - Potential actions: Determine whether Farm Bill (CP23A) is working / implemented. Education. Incentive payments. Playa buffers. Easements.
    - *Threat: Draining*

- Shortgrass prairie
    - Threat: *Development* (conversion of agriculture lands or pastures, *fragmentation, etc.*)
    - Threat: Grazing practices leading to homogenous habitats
    - Threat: Fire (lack of)
    - Threat: Potential loss of federal programs (e.g., Farm Bill)
    - Threat: Loss of native herbivores (e.g., Prairie dogs)

        - Potential actions for all threats: Implementation of the Colorado Division of Wildlife's 2003 Grassland Plan (Colorado Division of Wildlife 2003) (http://wildlife.state.co.us/species_cons/Grasslands/conservationplan.asp#ConservationPlan) expanded to include wind farm development (where research and a policy are needed). *Land protection (easements / purchase. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)*
- Sagebrush
    - Threat: Grazing management (i.e., domestic stock and wildlife) / practices (e.g., chaining)
    - Threat: Invasive exotic species (e.g., cheat grass) and encroachment of pinyon/juniper woodlands
        - Potential actions: Control or eliminate invasive exotic species, implement land-use, forest practices to restore healthy habitat
    - Threat: Fragmentation / loss (energy, housing, infrastructure development without adequate habitat safeguards),
        - *Potential actions: Maintain connectivity and improve linkages between fragments. Reclamation and restoration standards (e.g., development, enforcement, and funding sources for these).* Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)

- Threat: Fire regime control
- *Threat: Diseases and insects that are exacerbated by drought*
- *Threat: Conversion (e.g., development and agriculture)*
  - *Potential actions: Incorporate management strategies outlined in the Gunnison Sage Grouse R.C.P. across all sagebrush habitats.*

  - Potential action for all threats: Integrate existing plans to benefit all sagebrush obligate species. *Incorporate management strategies outlined in the Gunnison Sage Grouse R.C.P. across all sagebrush habitats. Develop best management practices for public and private lands for all sagebrush habitats. Work with counties to implement weed management. Education and outreach. Incentives for weed management (Eastern counties).*

- Pinyon/Juniper
  - Threat: Loss / die off (e.g., leading to even age stands, imbalance of species composition)
    - Potential actions: Increase awareness of management agencies. Implement restoration strategies. Bird population monitoring (potential population declines).
  - Threat: Fragmentation/loss (energy, housing, infrastructure development without adequate habitat safeguards)
    - Potential actions: Land use planning. Easements. Growth management (e.g., zoning at county and local government level).
  - Threat: Conflicting land use and management on both private and public lands.
    - Potential actions: Land use planning. Easements. Growth management (e.g., zoning at county and local government level).
  - *Threat: Invasive exotic species*

- Grass / forbs dominated wetlands
  - Threat: Change in hydrology (urban demand, groundwater pumping for agricultural use)
    - Potential actions: Improve water management (urban water management). Conservation. Outreach and education.
  - Threat: Conversion of wetlands (conversion and draining)
    - Potential actions: Outreach / incentive programs *for restoration or enhancement* (e.g., state and federal programs such as the Farm Bill). Easement and fee title land acquisition.
  - Threat: Removal / change of 404 Rules (implementation)
    - Potential actions: Legislative / regulatory changes. State assumes responsibilities.

- West Slope rivers
    - Potential action for broad application: Complete the ongoing development of a habitat conservation plan for Southwest Willow Flycatcher in San Luis Valley
  - Threat: Lack of water
  - Potential actions: Adding wildlife management into water control (dam control, water conservation). Return water flows for downstream use (urban return and wetland recharge). Instream flow water rights. Growth management (urban water conservation management).
  - *Threat: Water quality*
    - *Potential actions: Identify non-point source pollution and control / isolate these (both agricultural and urban). Better monitoring and enforcement of point source pollution. Identifying new pollutants and developing protective standards.*
  - Threat: Grazing (decreased understory; lack of regeneration)
    - Potential actions: Management change (off-river water sources, stream fencing, and seasonal rotation of stock). Landowner outreach (incentive programs, education). Conservation easements to decrease grazing.
  - Threat: Water controls, flow regimes, general water management
    - Potential actions: Adding wildlife management into water control (dam control, water conservation). Return water flows for downstream use (urban return and

wetland recharge). Instream flow water rights. Growth management (urban water conservation management).
    - Threat: Invasive exotic species (e.g., Russian olive, Tamarisk)
        - Potential actions: Active management (cutting, killing, re-planting). Proper land management (e.g., domestic and wildlife grazing management).
    - Threat: Development along floodplains
        - Potential actions: Land acquisition (e.g., easements). Maintaining (e.g., incentives) healthy land use (e.g., agriculture practices). Growth management / zoning.
    - Threat: Mineral extraction (gravel)
        - Potential actions: Land acquisition / easements. Maintaining healthy land (e.g., reclamation of land).
    - Threat: Development of dams and diversions
        - Potential actions: Improve water conservation practices. Adding wildlife management into water control (dam control, water conservation). Return water flows for downstream use (urban return and wetland recharge). Instream flow water rights. Growth management (urban water conservation management).

- Mid-grass Prairie
    - Threat: Urbanization (conversion of agriculture lands or pastures)
    - Threat: Grazing practices (over grazing and under grazing leading to homogenous habitats)
    - Threat: Fire (lack of)
    - Threat: Potential loss of federal programs (e.g., Farm Bill)
    - Threat: Loss of native herbivores (e.g., Prairie dogs)
        - Potential actions for all threats: Implement the Colorado Division of Wildlife's 2003 Grassland Plan expanded to include wind farm development (where research and a policy are needed. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc). *Land protection (easements / purchase.*
    - *Threat: Invasive exotic species*
        - Potential actions: Control or eliminate invasive exotic species

- Aspen forest
    - Threat: Grazing by native and domestic animals (e.g., lack of regeneration)
        - Potential actions: Create / implement agency (e.g., USDA Forest Service) management plans. Manage native species (e.g., elk).
    - Threat: Fire regime change from suppression activities (e.g., lack of regeneration)
        - Potential actions: Public land fire management (e.g., mechanical treatment) and restoration. Research (particularly for restoration techniques on bird populations). Education and outreach to private land owners. *Prescribed burning.*
    - Threat: Development (oil and gas, housing, ski resort development without adequate habitat safeguards)
        - Potential actions: Growth management. Education and outreach (e.g., better integration with wildlife needs. Easements.
    - *Threat: Invasive exotic species*
        - Potential actions: Control or eliminate invasive exotic species

- Ponderosa pine
    - Threat: Development (e.g., housing) causing fragmentation
        - Potential actions: Growth management (e.g., working with county governments). Education and outreach (e.g., better integration with State Forest Service, wild-land urban interface fire protection activities). Easements. *Work with land managers on land-use planning.*

    - Threat: Fire regime change from suppression activities
        - Potential actions: Public land fire management (e.g., mechanical treatment) and restoration. Research (particularly for restoration techniques on bird

populations). Education and outreach to private land owners. *Prescribed burning.*

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**Mammals**. Assessment of Key Landcover Types (Science Forum Results)

- Shortgrass prairie
    - Threat: Habitat loss (development and agriculture conversion)
        - Potential actions: Design conservation programs (set goals, focus on important conservation areas, etc.). Conserve areas (through purchase, incentive programs, easements, conservation agreements, best management practices, etc.). Work with counties already involved in land-use planning. Encourage counties not already doing land-use planning to do so. Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
    - Threat: Fragmentation (roads, urbanization, declining patch size, etc.)
        - Potential actions: Identify and manage large blocks of habitat. Facilitate connectivity. Work with transportation departments to minimize damage from road development, e.g., habitat conservation in wildlife corridors, wildlife crossings. Influence zoning and development policy to protect habitat. Education and outreach.
    - Threat: Degradation (homogenization through grazing patterns, noxious weeds, etc.)
        - Potential actions: Involve all counties in weed management programs. Implement rotational grazing for heterogeneity of pasture habitat. Grass banking. *U.S. Department of Agriculture Grassland Reserve Program.*

- Pinyon / Juniper
    - Threat: Most threats to this habitat are considered local in extent. For example, on the East Slope residential development is causing significant habitat loss.

Potential actions: Design conservation programs (set goals, focus on important conservation areas, etc.). Conserve areas (through purchase, incentive programs, easements, conservation agreements, best management practices, etc.). Work with counties already involved in land-use planning. Encourage counties not already doing land-use planning to do so. Habitat conservation in wildlife corridors, wildlife crossings.

- Foothills / mountain grassland
    - Threat: Development (loss of acreage and fragmentation)

Potential actions: Identify and manage large blocks of habitat. Facilitate connectivity. Work with transportation departments to minimize damage from road development. Influence zoning and development policy to protect habitat. Education and outreach. Easements and fee title acquisitions to protect game species (e.g., ungulate winter range) that also provides protection for other species. Transportation planning to reduce fragmentation, e.g., habitat conservation in wildlife corridors, wildlife crossings.

        - . *Work with land managers on land-use planning.*
    - Threat: Grazing issues (e.g., elk and livestock)
        - Potential actions: Incorporate best management practices(different approaches for public and private lands). Development of a management strategy to effectively meet population goals for elk. Relocation or corralling facilities to focus on alternative vegetation.
    - Threat: Noxious weeds
        - Potential actions: Implement best management practices (different approaches for public and private lands). Work with counties to implement weed management. Education and outreach. Incentives for weed management (Eastern counties).

- Sagebrush
    - Threat: Degradation (e.g. too much or too little grazing, fire and weeds)

        - Potential actions for grazing: Incorporate best management practices(different approaches for public and private lands). Development of a management strategy to effectively meet population goals for elk. Relocation of corralling facilities to focus on alternative vegetation.
        - Potential actions for weeds: Implement best management practices (different approaches for public and private lands). Work with counties to implement weed management. Education and outreach. Incentives for weed management (Eastern counties).
    - Threat: Conversion (e.g., development and agriculture)
        - Potential actions: Incorporate management strategies outlined in the Gunnison Sage Grouse R.C.P. across all sagebrush habitats. *Develop translocation techniques for species where population isolation cannot be avoided naturally.* Fully use existing federal programs like the Farm Bill-related programs(EQUIP, WRP, CRP, CREP, etc)
    - Threat: Fragmentation (e.g., energy and utilities infrastructure, *ranchette development* without adequate habitat safeguards)
        - Potential actions: Development best management practices for public and private lands for all sagebrush habitats. Maintain connectivity and improve linkages between fragments. Reclamation and restoration standards (e.g., development, enforcement, and funding sources for these).
    - *Threat: Diseases and insects that are exacerbated by drought*

- Exposed rock (cliffs, caves, mines, etc.)
    - Threat: Mine closures
        - Potential actions: Evaluate mines. Use bat-friendly closures. Restrict access. Recruit volunteers to help implement evaluations. Outreach and education.
    - Threat: Recreational use of caves
        - Potential actions: Outreach and education (encouraging ethical use of caves). Seasonal restrictions. Ongoing inventory and evaluation of caves. Explore ways to develop more effective management of the resource (e.g., multi-agency audits of cave use and users).
    - Threat: Reopening old mines
        - Potential actions: Work with developers and agencies for mitigation (recognize high-bat production mines as off-site mitigation opportunities). Education of developers and the public to raise awareness. Advanced notification of mine re-openings to allow consultation for mitigation opportunities.

## H. Additional Research and Survey Efforts

Research and survey needs were identified throughout the CWCS development process, including the contributions of the panels of scientists as well as contributions from the public and other organizations (Table 13). The many "unknowns" as shown in the reports of Section E and Appendix B (e.g., 16% species of unknown status, 40% species of unknown trends) certainly indicate research and survey needs for the subject species or habitats. A more overarching need, repeatedly stressed during conversations among contributors to the CWCS, is an efficient, streamlined system for rapid data integration and sharing among all entities conducting species and habitat surveys. As demonstrated by the many and varied information sources and web links cited throughout the CWCS it is difficult to "know what we know and know what we don't know."

The State of Colorado continues its commitment to research and surveys as vital to the science-based management of the CWCS but this document refrains from

prematurely committing to project design elements. In addition to addressing the "unknowns" that appear in the tables and reports, the Science Forum participants also identified the following needs for future research and survey. As in Section G, further insight gained from the stakeholder meetings is added here using *italic* text.

| Table 13. Research and Survey Emphasis Areas for Colorado's CWCS | |
|---|---|
| **Emphasis Area** | **Examples of Needs** |
| Improve data, information, and analysis support systems | Comprehensive and consistent wildlife-related data, information, and analysis support systems from diverse sources such as the CDOW, other state agencies, tribes, colleges and universities, NGOs, private sector vendors, etc. along with ensuring effective management and sharing of information. |
| Determine status, distribution, and species needs | Dealing with basic distribution, population status, habitat requirements of Species of Greatest Conservation Need, |
| Research species biology | Characteristics that make particular species more invasive, other species, important keystone species or other species more sensitive to stressors such as long-term drought. |
| Research ecosystem conditions | Projections of future conditions related to land conversion, water usage, species re/introductions, dam removal, road building, invasive exotic species, etc. and how these impact wildlife and wildlife habitat; likely involving adaptive management principles for large-scale biological systems. |
| Research stressors/threats; especially focusing predictive capacity | Improve ability to predict threats to vulnerable species including such variables as areas of future human disturbance; migration pathway barriers; baseline vegetation changes, etc. |
| Develop conservation, research, and monitoring tools | *Evaluating* alternative tools with respect to efficiency and effectiveness for species, suites of species, and/or habitats. |
| *Credit – we are grateful to the Arizona Game and Fish Department for providing this format from their CWCS that is parallel to our findings.* | |

## I. Potential Conservation Actions for Colorado's CWCS

The Science Forum participants identified a wide array of potential conservation actions (Section G) in the context of taxonomic groupings and their associated habitats. The tone of the question posed at the Science Forum was to have the experts suggest ways to deal with the issues they thought present the greatest risk to the highest-ranking species and their habitats. The following potential conservation actions emerged as themes broadly applicable to the array of key habitats in Colorado. For this strategic plan it is premature to predict what specific conservation actions are best suited to meet the needs of a particular species, taxonomic grouping, or land cover type. That decision will be left until specific project or management interventions are being planned and done in the context of using various funding sources, partnership opportunities, responsiveness to new information, etc. In many cases, such as the dozens of operational-level recovery, conservation, or other action plans listed in Table 15, priorities have been established, frequently using similar science-and-stakeholder processes that were

used in the development of the CWCS. The following information is meant to provide general priorities for partners to use in making specific project proposals.

Table 14. Potential Conservation Actions for Colorado's CWCS

Implementation of specific actions will be chosen after consideration of the specific needs for a species of greatest conservation need. These potential actions are not presented in order of priority. Potential actions specific to species groups and habitat types are presented in the Section G. Further insight gained from the stakeholder meetings were added using *italic* text.

| **Kind of Strategy** | **Kind of Activity Most Frequently Mentioned** |
|---|---|
| Conserving wildlife habitat | Perform landscape analyses to identify habitats and critical wildlife areas, etc. that would be most efficient and effective at preserving wildlife values |
| | All entities (state, federal, tribal, local government, private-sector, NGO) should share common benchmark measures of success to better coordinate objectives and efforts, if not directly, then *via* a comprehensive, consistent information system supported by, and accessible to, all organizations. |
| | Acquire ecologically important lands, access agreements, conservation easements, and/or water rights. |
| | Promote the restoration and protection of aquifers, springs, streams, rivers, lakes, and riparian systems. Support regulations ensuring minimum instream flow and water rights for wildlife resources. Address drought issues as they relate to wildlife. |
| | Instill more proactive use of 'regime management' approaches (e.g., fire management) to maintain desired successional stages for target wildlife species; *Control invasive exotic species.* |
| Maintaining and re-establishing habitat and landscape connectivity | Removing or modifying barriers, protecting corridors *(and approaches)*, riparian areas, using wildlife-friendly roadway crossings, *improving planning for wildlife needs in transportation projects*, etc. |
| | Promote maintenance and restoration of habitat connectivity by removing unneeded fences and by using wildlife-friendly barriers in future projects. |
| | Develop standards for new road, utility, power line, *and wind farm* construction, modification of existing structures and corridors; *and recreation management* to reduce impacts to wildlife. |
| | Perform landscape analyses to identify wildlife corridors, and best management practices, etc. that would be most efficient and effective at preserving wildlife values. |
| Wildlife management | Promote implementation of existing recovery plans, habitat conservation plans, and other cooperative agreements. Develop consistent benchmark measures of success shared by all organizations. Develop plans to conserve priority species that are not sufficiently addressed under existing plans. *Examples are the U.S. Fish and Wildlife Service Landowner Incentive Program and Safe Harbor Agreements.* |
| | Manage to sustain or enhance sport fish and native fish populations. |

Table 14. Potential Conservation Actions for Colorado's CWCS

Implementation of specific actions will be chosen after consideration of the specific needs for a species of greatest conservation need. These potential actions are not presented in order of priority. Potential actions specific to species groups and habitat types are presented in the Section G. Further insight gained from the stakeholder meetings were added using *italic* text.

| **Kind of Strategy** | **Kind of Activity Most Frequently Mentioned** |
|---|---|
| | Develop programs for species that are not yet of high priority concern so they do not become a concern in the future. |
| | Maintain and construct new wildlife-friendly partnerships with private landowners such as ranchers and farmers. |
| Public education and law enforcement to benefit wildlife and wildlife habitat | Educate the public about the impacts of activities detrimental to sensitive wildlife species (e.g., release of exotic species, illegal fish stocking, *wildlife – vehicle collisions, "rescuing" wildlife "orphans")* |
| | Utilize education and enforcement to promote human behavior that does not encourage wildlife to become a nuisance (for example: feeding wildlife, securing waste containers, and storage of food). Increase awareness of effects of feeding and litter on wildlife. |
| | Increase public awareness of how water conservation and ensuring instream flow can benefit wildlife. |
| | Encourage the use of native plants and other low water-use plants in landscaping. |
| | Educate the public regarding identification of contaminants, release prevention, and impacts to wildlife and habitats. Promote alternatives that reduce release of contaminants. |
| | Increase public awareness of the potential effects of various types of recreation on wildlife resources. Encourage responsible outdoor recreation through education (for example "Be Bear Aware," "Stop Aquatic Hitchhikers", enforce existing laws, and encourage development of new legislation. |
| | Educate development industries (e.g., housing, mineral extraction, communication, power generation) about avoiding and/or mitigating wildlife impacts. |
| | Educate the public on the importance of community focal species (including predators, prey, wide-ranging species, keystone species, etc.) for ecosystem health. |
| Representing wildlife values in multiple-use planning and representing wildlife values in other processes | Provide recommendations to *and coordinate with* state, federal, and local government agencies that are creating new or revising land management plans. |
| | Promote adoption of sustainability standards or best management practices for forage management for livestock and wildlife. |
| | Promote conservation of sensitive areas and habitats for wildlife. |
| | Encourage development and implementation of standards and guidelines for commercial activities that convert important wildlife landscapes to alternative uses (e.g., mining, landfill operations). |

Table 14. Potential Conservation Actions for Colorado's CWCS

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| Kind of Strategy | Kind of Activity<br>Most Frequently Mentioned |
|---|---|
| | Encourage land management agencies to manage road and trail networks to ensure sustainable wildlife resources in balance with recreational opportunities, economic pursuits, and rural development. |
| | Encourage transportation and other infrastructure development organizations to ensure sustainable wildlife resources are incorporated in their planning and project designs *as well as promote the adoption of best management practices.* |
| | Coordinate with land managers, counties, municipalities and private sector partners to promote ecologically sensitive design of recreational facilities such as campgrounds, parks, golf courses, ski resorts, *urban and suburban development*, etc. |
| | Encourage the operation of dams, canals, and diversions for improving or maintaining wildlife resources. Promote wildlife values in building new, renovating existing, or removing old water retaining structures. |
| | Promote programs for eliminating or limiting the spread of invasive plants and animals, and the recovery or reintroduction of native populations. |
| | Limit the spread of invasive exotic plants and promote the restoration of native vegetation in disturbed areas. |
| | *Protect natural wetlands and* promote the use of engineered wetlands, discharge basins, and augmented riparian vegetation to pre-treat water prior to release into riparian systems. Promote the use of treated effluent to create wildlife habitat. |

## J. Proposed Monitoring Plans

As a strategic action, monitoring involves more than tracking the status and trends of wildlife populations and their habitats. Utmost in priority to achieving the goals of the CWCS is the ability to monitor progress toward benchmark measures of success and population security thresholds for species, species assemblages, and habitat/land cover types. This allows conservation organizations and others to adaptively manage their activities and make more efficient use of their resources as new information accumulates. Input received from our citizens, as well as advice from conservation organizations and agencies clearly reflects the need for a comprehensive system that allows information from past and future inventories, surveys, research, and management actions to be accumulated from all entities, consolidated at multiple scales, and easily and rapidly distributed and compared to benchmarks (sidebar). Various organizations in Colorado currently have many of the elements needed for such a system, but the unifying platform, whether virtual or traditional, is incomplete.

A recent governor's initiative in Colorado to consolidate data on protected lands in the state could provide a model for such a comprehensive system (Paulson 2005). The Colorado Ownership, Management, and Protection project (COMaP, http://www.nrel.colostate.edu/projects/comap/index.html ) is a joint effort of CDOW, Colorado State University, and The Nature Conservancy, and is a high priority project for Great Outdoors Colorado ("lottery") funding. The system is designed to acquire and consolidate a comprehensive inventory of protected lands statewide, whether those lands are protected by state or federal agencies, local governments, or private land trusts or conservation organizations (Theobald et al. 2005).

Key recommendations for CWCS monitoring, adapted from Illahee (2005) and contributions from panels of experts, conservation organizations and members of the public.

The basic elements of a monitoring program include the following:

1. Identify partners, other affected interests, and needed resources

2. Establish common and collective benchmark measures of success and monitoring tools (including predictive models) applicable at multiple scales

3. Identify available information sources and determine whether existing data structures and data capture systems are adequate to allow comprehensive "roll up" of information from multiple entities. If not, design a suitable structure.

4. Allocate responsibilities for system maintenance, monitoring, quality assurance among various partners (may include agencies, ngo's, private citizens or interests)

5. Evaluate the success of conservation actions against benchmarks periodically and make adjustments as necessary within an adaptive management framework.

6. Develop an efficient and effective communication system for reporting and disseminating information to decision-makers and other stakeholders, including the public.

At the level of species and habitat monitoring, and in keeping with the concepts behind the design of Comprehensive Wildlife Conservation Strategies, advice from the United States Fish and Wildlife Service, and the International Association of Fish and Wildlife Agencies, Colorado's monitoring will first employ existing surveys and inventories, including monitoring being done by conservation partners. Monitoring will also be used to determine when conservation actions have adequately solved conservation issues and when conservation success is not achieved leading to new plan actions. In a number of cases monitoring or research will need to be the first step when existing conditions are unknown (Tables 4 – 10).

Science Forum participants as well as contributors during the public comment period recommended that the following monitoring issues and approaches be considered for each taxonomic group.

**Amphibians and Reptiles Monitoring Concerns**

- Surveys
- Remote sensing
- Satellite imagery
- Disease monitoring
- Movement monitoring
- Breeding sites (survey sampling)
- DNA sampling
- Net sampling
- Herpetological web site (Citizen Survey)
- Predictive modeling
- Ground truthing
- Taxonomic affinities / reclassification

**Birds Monitoring Concerns**

- Population monitoring
    - Identify species to act as indicator species for specific habitat of interest (e.g., index of healthy habitat). These target species could be species of conservation concern, umbrella species, specialist species, etc.
    - Identify the question(s) that monitoring could answer.
    - Reference North American Bird Conservation Initiative
    - Integration of existing programs
    - Multi-agency / organization planning and coordination (long-term funding) – link to "Identify the question(s)," above
    - Identify population trends of the species of greatest conservation need by group (develop appropriate species monitoring techniques; develop of sampling / trend monitoring techniques)
- Habitat monitoring
    - Adequate delineation of existing habitats (i.e., baselines)
    - Project tracking (within and among projects; individual and multi-project tracking)
    - Identify priority areas (where and how much) for projects and targets
    - Monitor habitat loss and cause of loss (habitat degradation)
    - Include quantity and quality (class and condition); recognizing that "quality" depends on species of interest
- Project-level monitoring
    - Evaluate habitat quality for specific species
    - Basic research into habitat relationships
    - Evaluate effects of specific projects on bird populations
    - Adaptive management practice

**Fish and Mollusks Monitoring Concerns**

- Presence / absence (distribution) information. Use repeatable methods. Define / identify occupied habitat. Define / identify available habitat. Identify the number of populations.
- Population estimates for large-bodied species including trend and recruitment information.
- Length frequency distributions (i.e., develop demographic indices).
- Community-level monitoring (e.g., IBI).
- For small-bodied species presence / absence; relative abundance, and evidence of successful reproduction information.
- Randomize appropriately (e.g., stratify and represent by randomizing the range of habitat).
- Replication.
- Adequate frequency of monitoring.

- Provide measures of reliability.
- Estimate the habitat / population link.
- Monitor implementation of conservation actions.

**Invertebrates Monitoring Concerns**

None listed at Science Forum

- *Lack of clear management authority. (public comment).*

**Mammals Monitoring Concerns**

- Baseline information on biological status / population health on species and habitats.
- Use current land cover base to design systematic sampling to assess and rank conditions of habitat (e.g., a multi-agency effort).
- Conduct threats assessment (historical, current, and trend predictions).
- Create progress measurements for goal attainment (e.g., measurable components, policy, and feasibility).
- Set specific objectives, monitoring standards, coordination requirements, and consistency between agencies. Application methods and standards may vary by type of land ownership.
- Set up effectiveness monitoring.
- Identify and/or develop best monitoring methodologies fro targeted mammals (e.g., documentation of standards, training).
- For fragmentation issues measurements of patch size, frequency, distribution, and context (i.e., what is around the patches).
- Increase presence / absence surveys to monitor changes over time that are simple, easy to implement, and reflects community sampling.
- Increased coordination in acquisition and application of data to maximize effectiveness and efficiency of resources.
- Coordination and standards between states (i.e., create the ability to roll-up information in the future).

## K. Coordination of Conservation Actions with Relevant Partners

Two strategies will ensure continued coordination with relevant partners. First is to maintain the 'transparent' process used to develop this CWCS. Potential partners were notified by letter of the strategy development almost as soon as it began and invited to participate. Nearly 1,000 initial letters began the process of communication and coordination. Numerous potential partnerships are identified in the Science Forum dealing with individual habitats, issues, conservation actions and monitoring strategies and this list was expanded as a result of the stakeholder process. Other mechanisms used for communication and coordination and involving relevant partners in preparing this CWCS are listed in Section B. Communication can be characterized as diverse and widespread and will continue throughout the implementation of this CWCS. It is the State of Colorado's intent to maintain this transparent and participatory approach to coordinate with current partners and to recruit additional ones.

The second strategy is to integrate the priorities identified in this CWCS into the substantial wildlife management infrastructure that already exists in Colorado. This is to begin with integration of the efforts reflected in Table 15 with the CWCS priorities, the opportunities it presents for partnerships, and potential benefits of synergistic projects. In order to facilitate this integration the Division of Wildlife has initiated a central location on its web site to provide access to all conservation, recovery, or other action plans for Colorado's wildlife (http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/)

Table 15. A sample of existing species-specific and multi-species conservation, recovery, and other action plans and agreements for Colorado wildlife. These and other plans that are in electronic format may be accessed *via* the CDOW website, http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/

| Species | Species Plans and/or Agreements | Multi-Species Plans |
|---|---|---|
| Gunnison Sage-grouse | • Gunnison Sage-grouse Rangewide Steering Committee (2005);<br>• Conservation Plan/Agreement with Assurance;<br>• WAFWA MOU National Sage Grouse Habitat Conservation Strategy;<br>• Local work group plans (6) | • Rich et al. (2004) ;<br>• Intermountain West Joint Venture;<br>• Neely et al. (2001);<br>• Tuhy et al. (2002)<br>• Colorado Important Bird Areas Program; |
| Greater Sandhill Crane | • State Recovery Plan | • Colorado Important Bird Areas Program;<br>• Neely et al. (2001) |
| Greenback Cutthroat Trout | • U.S. Fish and Wildlife Service (1998b) | • Neely et al. (2001) |
| Greater Sage Grouse | • WAFWA MOU National Sage Grouse Habitat Conservation Strategy;<br>• Local working group plans (4) | • Rich et al. (2004);<br>• Intermountain West Joint Venture;<br>• Neely et al. (2001) |

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| Species | Species Plans and/or Agreements | Multi-Species Plans |
|---|---|---|
| Roundtail Chub | | • State Conservation Plan (3-Species Plan) (WY, CO, UT, NM, AZ, NV) |
| Colo. River Cutthroat Trout | • Multi-agency Tri-State CACS (CO, UT, WY) | • Neely et al. (2001) |
| Colorado Pikeminnow | • Fed Recovery Plan | • Neely et al. (2001) |
| Rio Grande Cutthroat Trout | • Multi-agency CO-NM CACS,<br>• Colorado Conservation Plan | • Neely et al. (2001) |
| River Otter | • CDOW (2003b) | |
| Black-footed Ferret | • U.S. Fish and Wildlife Service (1988);<br>• Wolf Creek and Coyote Basin Cooperative Mgmt. Plan;<br>• Little Snake Cooperative Management Plan | |
| Bonytail Chub | • Federal Recovery Plan | |
| Mountain Plover | | • Playa Lakes Joint Venture (*in prep.)*;<br>• Intermountain West Joint Venture;<br>• CDOW (2003a);<br>• The Nature Conservancy Central Shortgrass Prairie Ecoregional Assessment;<br>• Brown et al. (2001);<br>• Central Plains/Playa Lakes Shorebird Conservation Plan;<br>• Colorado Important Bird Areas Program;<br>• Neely et al. (2001) |
| Razorback Sucker | • U.S. Fish and Wildlife Service (1998c) | |
| Lesser Prairie-Chicken | • W. Governor's Association Interstate Working Group;<br>• State Recovery Plan;<br>• Lesser Prairie-chicken Conservation Initiative. | • Playa Lakes Joint Venture (*in prep.)*;<br>• The Nature Conservancy Central Shortgrass Prairie Ecoregional Assessment;<br>• Rich et al. (2004);<br>• N. Am. Grouse Mgt Plan (draft only) ;<br>• Colorado Important Bird Areas Program;<br>• Neely et al. (2001) |
| Bald Eagle | • Federal Recovery Plan | |
| Humpback Chub | • Federal Recovery Plan | |

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| Species | Species Plans and/or Agreements | Multi-Species Plans |
|---|---|---|
| Black-tailed Prairie Dog | • Multi-agency MOU;<br>• Multi-State Conservation Plan for BTPD in the United States | • CDOW (2003a);<br>• The Nature Conservancy Central Shortgrass Prairie Ecoregional Assessment;<br>• Neely et al. (2001) |
| American Peregrine Falcon | • Federal Recovery Plan (resulted in a monitoring plan for this de-listed species) | • Rich et al. (2004) |
| Common Shiner | • State Recovery Plan | • So. Platte Native Fish Conservation Plan;<br>• Neely et al. (2001) |
| Boreal toad | • The Boreal Toad Recovery Team and Technical Advisory Group (2001);<br>• Conservation Agreement w/Assurances | • Neely et al. (2001) |
| Burrowing Owl | • Klute et al. (2003) | • CDOW (2003);<br>• Rich et al. (2004);<br>• The Nature Conservancy Central Shortgrass Prairie Ecoregional Assessment;<br>• Playa Lakes Joint Venture (*in prep.)*;<br>• Intermountain West Joint Venture; |
| Plains Minnow | • State Recovery Plan | • South Platte Native Fish Conservation Plan;<br>• Arkansas River Native Fish Conservation Plan |
| Suckermouth Minnow | • State Recovery Plan | • South Platte Native Fish Conservation Plan;<br>• Arkansas River Native Fish Conservation Plan;<br>• Neely et al. (2001) |
| Northern Redbelly Dace | • State Recovery Plan | • South Platte Native Fish Conservation Plan |
| Columbian Sharp-tailed Grouse | • Multi-agency Conservation Plan and Agreement | • Hoffman (2001);<br>• Neely et al. (2001) |
| Swift Fox | • Kahn et al. (1997) | • CDOW (2003);<br>• The Nature Conservancy Central Shortgrass Prairie Ecoregional Assessment;<br>• Neely et al. (2001) |
| Gunnison's Prairie Dog | | • Neely et al. (2001) |
| Brassy Minnow | • State Recovery Plan | • South Platte Native Fish Conservation Plan;<br>• Neely et al. (2001) |
| Whooping Crane | • Federal Recovery Plan | • Kushlan et al. (2002) |

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| Species | Species Plans and/or Agreements | Multi-Species Plans |
|---|---|---|
| Kit Fox | | • Boyle and Reeder (2005) |
| SW Willow Flycatcher | • Federal Recovery Plan | • Inter-mountain West Joint Venture;<br>• Tuhy et al. (2002);<br>• Neely et al. (2001) |
| Rio Grande Sucker | • State Recovery Plan | • Neely et al. (2001) |
| Rio Grande Chub | • State Recovery Plan | • Neely et al. (2001) |
| Long-billed Curlew | | • Playa Lakes Joint Venture (*in prep.)*;<br>• Brown et al (2001);<br>• Central Plains/Playa Lakes Shorebird Conservation Plan;<br>• The Nature Conservancy Central Shortgrass Prairie Ecoregional Assessment |
| Ferruginous Hawk | | • CDOW (2003);<br>• Rich et al. (2004);<br>• The Nature Conservancy Central Shortgrass Prairie Ecoregional Assessment;<br>• Playa Lakes Joint Venture (*in prep.)*;;<br>• Intermountain West Joint Venture; |
| Plains Sharp-tailed Grouse | • State Recovery Plan | • Rich et al. (2004) |
| Arkansas Darter | • State Recovery Plan | • Neely et al. (2001) |
| Lake Chub | | |
| White-tailed Prairie Dog | • Seglund et al. (*in prep.*) | • Neely et al. (2001) |
| Southern Redbelly Dace | • State Recovery Plan | • Arkansas River Native Fish Conservation Plan |
| Piping Plover | • Federal Recovery Plan | • Brown et al. (2001);<br>• Central Plains/Playa Lakes Shorebird Conservation Plan;<br>• State of Colorado Piping Plover and Interior Least Tern Recovery Plan (1994) ;<br>• Colorado Important Bird Areas Program |
| Western Snowy Plover | | • Brown et al (2001);<br>• Central Plains/Playa Lakes Regional Shorebird Conservation Plan;<br>• Colorado Important Bird Areas Program |

Table 15. A sample of existing species-specific and multi-species conservation, recovery, and other action plans and agreements for Colorado wildlife. These and other plans that are in electronic format may be accessed *via* the CDOW website, http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/

| Species | Species Plans and/or Agreements | Multi-Species Plans |
|---|---|---|
| Mexican Spotted Owl | • Federal Recovery Plan | • Rich et al. (2004);<br>• Colorado Important Bird Areas Program;<br>• Neely et al. (2001) |
| Lynx | • Multi-agency Conservation Plan and Agreement | • Neely et al. (2001);<br>• CDOW (2002) |
| Preble's Meadow Jumping Mouse | • U.S. Fish and Wildlife Service (2003) | • Neely et al. (2001) |
| Least Tern | • Federal Recovery Plan | • Playa Lakes Joint Venture (*in prep.)*;<br>• Kushlan et al. (2002);<br>• State of Colorado Piping Plover and Interior Least Tern Recovery Plan (1994) ;<br>• Colorado Important Bird Areas Program |
| Wolf | • Federal Recovery Plan;<br>• Colorado wolf management working group (2004). | • Neely et al. (2001) |

## L. Incorporating New Information into the CWCS

As new information becomes available it will be incorporated into the CWCS. Colorado frequently employs adaptive management approaches using management interventions as experiments and monitors the effects of management treatments to adjust future plans. Colorado Division of Wildlife species conservation plans provide quantified management objectives and security benchmarks that are reflected in its "Work Package" planning system (Fig.3). These work packages will continue to be developed for CWCS-eligible projects so progress against those objectives can be measured both within the specific plans and the CWCS. Due to the costliness of measuring the outcomes of some management interventions, not all will be measured with the same rigor. Nevertheless, the CWCS will require periodic review and revision and Colorado will routinely continue to accumulate information on performance using such variables as status and trends of species of greatest conservation need and trends in habitat condition along with assessment of specific project outcomes.

**Work Package**
0841 Least Tern Recovery

**Work Package Description:**
The purpose of this work package is to maintain viable, self-sustaining populations of least tern. Colorado management objectives and recovery benchmarks are to upgrade from Endangered to Threatened when > 25 breeding pairs @ > 0.7 young fledged/breeding pr is sustained for > 5 consecutive yrs.
Delist from Threatened when an avg. of > 50 breeding pairs @ > 0.7 young fledged/breeding pr. is sustained for > 5 consecutive years over 2 separate and distinct breeding areas with > 3 breeding prs. @ 0.7 young fledged/breeding pair.
Activities include monitoring nesting population and productivity, nest relocation, and habitat enhancement at John Martin, Adobe Creek, Verhoeff, and Great Plains reservoirs in southeastern Colorado.

**Out Come Measurement**
Number of breeding pairs @ 0.7 young fledged
Number of separate and distinct breeding areas w/ > 3 breeding pairs @ > 0.7 young fledged
Species secure, not on state or federal T&E list

Figure 3. Example of Colorado Division of Wildlife Work Package, demonstrating management objectives and security benchmarks

## M. Review and Updates to the CWCS

In the near term, CWCS review and incorporation of new information will be performed in traditional fashion using similar procedures to this initial effort, at an interval of not less than 5 years, and no more than 10. This timeframe will allow the effects of the Strategy and the operational or action plans and activities that flow from it to be adequately expressed and evaluated before extensive modification. As described elsewhere, a future vision of adopting a more aggressive adaptive management strategy, with the CWCS residing on a database platform (vs. a fixed text document), allowing ongoing updates to reflect changes in species and habitat status, conservation accomplishments as they occur (i.e., a "living" strategy). This will facilitate ongoing communication and coordination among conservation partners and the incorporation of information they gain through their normal operations. Thus, updates and review of the CWCS would be a continuous, rather than a punctuated process. Oversight and maintenance of such a systems approach would be accomplished *via* pooled resources of collaborating entities, including an oversight committee of those collaborators. Given current fiscal, logistical, and technological constraints, contributors to the CWCS who recommended this approach typically acknowledged it as a longer-term vision rather than necessarily an initiative to be undertaken in the immediate future.

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## Appendix A

## Application of the Criteria Used To Select the Species of Greatest Conservation Need

The specific criteria used to include or exclude species in the list of species of greatest conservation need are:

| | M*eeting any of the Following* |
|---|---|
| Inclusion Criteria | Listed as federal candidate (C), threatened (T) or endangered (E) species under the ESA.<br>Classified as state endangered E), threatened (T) , or species of special concern (SC).<br>Global ranking scores of G1, G2 or G3 by the Colorado Natural Heritage Program[1].<br>Identified as conservation priorities through a range-wide status assessment or assessment of large taxonomic divisions.<br>Assigned state ranking scores of S1 or S2 AND a global ranking score of G4 by the Colorado Natural Heritage Program[2]. |
| Exclusion Criteria | *Species meeting the inclusion criteria were eliminated from the Species of Greatest Conservation Need listing if they met any of the following:*<br>Occurs peripherally in Colorado but is common elsewhere AND for which management actions in Colorado are likely to have no population-level effect.<br>Very common but were placed on lists due to economic considerations (e.g., Mallard). |

[1] G1 is critically imperiled globally because of rarity (5 or fewer occurrences in the world; or very few remaining individuals), or because some factor of its biology makes it especially vulnerable to extinction. G2 is imperiled globally because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range. G3 is vulnerable throughout its range or found locally in a restricted range (21 to 100 occurrences). From: Colorado Natural Heritage Program, http://www.cnhp.colostate.edu.

[2] S1 is critically imperiled in state because of rarity (5 or fewer occurrences in the state; or very few remaining individuals), or because some factor of its biology makes it especially vulnerable to extinction. S2 is imperiled instate because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range. G4 is apparently secure in state, though it might be quite rare in parts of its range, especially at the periphery. From: Colorado Natural Heritage Program, http://www.cnhp.colostate.edu.

Table A1 - Mollusks - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| *Acroloxus coloradensis* | Rocky Mountain Capshell | | SC | G1G2 | S1 | |
| *Anodontoides ferussacianus* | Cylindrical papershell | | SC | G5 | S2 | |
| *Ferrissia fragilis* | | | | G5 | S2 | |
| *Ferrissia walkeri* | | | | G4G5 | S3 | |
| *Physa cupreonitens* | Hot Springs Physa | | | G2 | S2 | |
| *Physa utahensis* | Banded Physa | | | G2 | S1 | |
| *Promenetus exacuous* | | | | G5 | S2 | |
| *Promenetus umbillicatellus* | | | | G4 | S3 | |
| *Uniomerus tetralasmus* | Pondhorn | | | G4 | S1 | |

| Table A2 - Insects - Species of greatest conservation concern (Science Forum Results). | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Criteria for inclusion or exclusion.** | | | | | |
| | | **Fed T/E/C** | **State T/E/SC** | **CNHP G1, G2 or G3** | **S1 or S2 AND G4** | **Rangewide assessment** |
| **Stoneflies (Plecoptera)** | | | | | | |
| *Capnia arapahoe* | Arapahoe Snowfly | | | | | 1/ |
| *Capnia nelsoni* | Nelson's snowfly | | | | | 1/ |
| *Mesocapnia frisoni* | Plains Snowfly | | | | | 1/ |
| **Mayflies (Ephemeroptera)** | | | | | | |
| *Ametropus albrighti* | Mayfly, spp. | | | | | 1/ |
| **Dragonflies and Damselflies (Odonata)** | | | | | | |
| *Argia alberta* | Paiute Dancer | | | G4 | S1S2 | |
| *Gomphus intricatus* | Brimstone Clubtail | | | G4 | S2 | |
| *Libellula nodisticta*[1/] | Hoary Skimmer | | | G4 | S1 | |
| *Somatochlora ensigera* | Lemon-faced Emerald | | | G4 | S1 | |
| *Sympetrum madidum* | Red-veined Meadowfly | | | G4 | S1 | |
| *Tetragoneuria petechialis* | Stripe-winged Baskettail | | | G4 | S2 | |
| **Beetles (Coleoptera)** | | | | | | |
| *Amblyderus werneri* | Great Sand Dunes Anthicid Beetle | | | G1? | S1 | |
| *Cicindela theatina* | San Luis Dunes Tiger Beetle | | | G1 | S1 | |
| **Butterflies and Moths (Lepidoptera)** | | | | | | |
| *Atrytone arogos* | Arogos Skipper | | | G3G4 | S2 | |
| *Euphyes bimacula* | Two-spotted Skipper | | | G4 | S2 | |
| *Hesperia leonardus Montana* [++] | Pawnee Montane Skipper | T | | G4T1 | S1 | |
| *Hesperia ottoe* | Ottoe Skipper | | | G3G4 | S2 | |
| *Polites rhesus* | Rhesus Skipper | | | G4 | S2S3 | |
| *Pyrgus xanthus* | Xanthus Skipper | | | G3G4 | S3 | |
| *Erynnis martialis* | Mottled Duskywing | | | G3G4 | S2S3 | |
| **Gossamer-winged Butterflies** | | | | | | |
| *Callophrys comstocki* | Comstock's Hairstreak | | | G2G3 | S1 | |
| *Callophrys mcfarlandi* | Sandia Hairstreak | | | G4 | S1 | |
| *Callophrys mossii schryveri* | Moss's Elfin | | | G3G4T3 | S2S3 | |
| *Celastrina humulus* | Hops Feeding Azure | | | G2G3 | S2 | |
| *Euphilotes rita* | Colorado Blue | | | G3G4T2T3 | S2 | |

Table A2 - Insects - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| *coloradensis* | | | | | | |
| *Euphilotes rita emmeli* | Desert Buckwheat Blue | | | G3G4T2 | S1 | |
| *Euphilotes spaldingi* | Spalding's Blue | | | G3G4 | S2S3 | |
| *Eurystrymon favonius ontario* | Northern Hairstreak | | | G4T4 | S1 | |
| *Incisalia fotis* | Early Elfin | | | G3G4 | S2S3 | |
| **Brush-footed Butterflies** | | | | | | |
| *Boloria improba acrochema* +++ | Uncompahgre fritillary | E | | | | |
| *Speyeria idalia* | Regal fritillary | | | G3 | S1 | |
| *Speyeria nokomis nokomis* | Great Basin Silverspot Butterfly | | | G3T1 | S1 | |
| **Satyrids** | | | | | | |
| *Agapema homogena* | Rocky Mountain Agapema | | | G4 | S2 | |
| *Anisota oslari* | Oslar's Oakworm Moth | | | G2G4 | S1 | |
| *Coloradia luski* | Lusk's Pinemoth | | | G4 | S1? | |
| *Hemileuca neumoegeni* | A Buckmoth | | | G4 | S1 | |
| **Sphinx Moths** | | | | | | |
| *Euproserpinus wiesti* | Wiest's Sphinx Moth | | | G3G4 | S2 | |
| *Proserpinus flavofasciata* | Yellow-banded Day Sphinx | | | G4 | S1 | |
| *Sagenosoma elsa* | A Sphinx Moth | | | G4 | S1? | |

1/ Added in the Science forum (Source: Dr. Boris Kondratieff, Colorado State University.

++ U.S. Fish and Wildlife Service. 1998. Pawnee montane skipper butterfly (*Hesperia leonardus Montana)* recovery plan. Denver, CO 16 pp.

+++ Fish and Wildlife Service. 1994. Uncompahgre fritillary butterfly recovery plan. Denver, CO. 20pp.

Table A3 - Arachnids - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| *Hypochilus bonneti* | A lampshade spider | | | | | 1/ |

1/ Added as a result of review by the scientists participating in the Questionnaire and Science Forum.

| Table A4 - Reptiles - Species of greatest conservation concern (Science Forum Results). | | | | | | |
|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Criteria for inclusion or exclusion.** | | | | |
| | | **Fed T/E/C** | **State T/E/SC** | **CNHP G1, G2 or G3** | **S1 or S2 AND G4** | **Rangewide assessment** |
| **Turtles** | | | | | | |
| *Kinosternon flavescens* | Yellow mud turtle | | SC | Not Tracked | Not Tracked | |
| **Lizards** | | | | | | |
| *Gambelia wislizenii* | Longnose leopard lizard | | SC | Not Tracked | Not Tracked | |
| *Phrynosoma cornutum* | Texas horned lizard | | SC | Not Tracked | Not Tracked | |
| *Phrynosoma modestum* | Roundtail horned lizard | | SC | Not Tracked | Not Tracked | |
| *Cnemidophorus neotesselatus* | Triploid checkered whiptail | | SC | Not Tracked | Not Tracked | |
| **Snakes** | | | | | | |
| *Leptotyphlops dulcis* | Texas blind snake | | SC | Not Tracked | Not Tracked | |
| *Hypsiglena torquata* | Night snake | | SC | Not Tracked | Not Tracked | |
| *Lampropeltis getula* | Common kingsnake | | SC | Not Tracked | Not Tracked | |
| *Rhinocheilus lecontei* | Long-nosed snake | | | | | 1/ |
| *Tantilla horbartsmithi* | Southwestern black-headed snake | | | | | 1/ |
| *Thamnophis cyrtopsi* | Blacknecked garter snake | | | | | 1/ |
| *Thamnophis sirtalis* | Common garter snake | | SC | Not Tracked | Not Tracked | |
| *Crotalus viridis concolor* | Midget faded rattlesnake | | SC | Not Tracked | Not Tracked | |
| *Sistrurus catenatus* | Massasauga | | SC | Not Tracked | Not Tracked | |

Classification scheme from: Hammerson, G. 2000. Amphibians and reptiles of Colorado. 2nd ed. University Press of Colorado, Boulder, CO.

1/ Added as a result of review by the scientists participating in the Questionnaire and Science Forum.

Table A5 - Amphibians - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| **Toads** | | | | | | |
| *Scaphiopus couchii* | Couch's Spadefoot | | SC | G5 | S1 | |
| *Bufo boreas boreas* | Boreal Toad (Southern Rocky Mountain Population) | | E | G4T1Q | S1 | |
| *Bufo debilis* | Green toad | | | | | 1/ |
| **Frogs** | | | | | | |
| *Acris crepitans* | Northern cricket frog | | SC | Not Tracked | Not Tracked | |
| *Hyla arenicolor* | Canyon tree frog | | | | | 1/ |
| *Gastrophryne olivacea* | Great Plains Narrowmouth Toad | | SC | G5 | S1 | |
| *Rana blairi* | Plains Leopard Frog | | SC | G5 | S3 | |
| *Rana pipiens* | Northern Leopard Frog | | SC | G5 | S3 | |
| *Rana sylvatica* | Wood Frog | | SC | G5 | S3 | |

Classification scheme from: Hammerson, G. 2000. Amphibians and reptiles of Colorado. 2nd ed. University Press of Colorado, Boulder, CO.

1/ Added as a result of review by the scientists participating in the Questionnaire and Science Forum.

Table A6 - Fish - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| **Sunfishes** | | | | | | |
| *Lepomis humilis* | Orangespotted sunfish | | | | | 1/ |
| **Catfishes** | | | | | | |
| *Noturus flavus* | Stonecat | | SC | Not Tracked | Not Tracked | |
| **Perch-like Fishes** | | | | | | |
| *Etheostoma cragini* | Arkansas Darter | | T | G3 | S2 | |
| *Etheostoma exile* | Iowa darter | | SC | Not Tracked | Not Tracked | |
| *Etheostoma spectabile* | Plains orangethroat darter | | SC | Not Tracked | Not Tracked | |
| **Suckers** | | | | | | |
| *Catostomas discobolus* | Bluehead Sucker | | | | | X |
| *Catostomas latipinnis* | Flannelmouth Sucker | | | | | X |
| *Catostomus playtrhynchus* | Mountain sucker | | SC | Not Tracked | Not Tracked | |
| *Catostomus plebeius* | Rio Grande Sucker | | E | G3G4 | S1 | |
| *Xyrauchen texanus* | Razorback Sucker | E | E | G1 | S1 | X |
| **Minnows** | | | | | | |
| *Gila elegans* | Bonytail | E | E | | | X |
| *Ptychocheilus lucius* | Colorado Pikeminnow | E | T | G1 | S1 | X |
| *Hybognathus hankinsoni* | Brassy minnow | | T | Not Tracked | Not Tracked | |
| *Luxilus cornutus* | Common shiner | | T | Not Tracked | Not Tracked | |
| *Platygobio gracilus* | Flathead chub | | | Not Tracked | Not Tracked | 1/ |
| *Gila cypha* | Humpback Chub | E | T | G1 | S1 | X |
| *Couesius plumbeus* | Lake Chub | | E | Not Tracked | Not Tracked | |
| *Hybognathus placitus* | Plains minnow | | E | Not Tracked | Not Tracked | NatureServe G4 |
| *Phoxinus eos* | Northern Redbelly Dace | | E | G5 | S1 | |
| *Gila pandora* | Rio Grande Chub | | SC | G3 | S1? | |
| *Gila robusta* | Roundtail Chub | | SC | G3 | S2 | |
| *Phoxinus erythrogaster* | Southern Redbelly Dace | | E | G5 | S1 | |
| *Phenacobius mirabilis* | Suckermouth minnow | | E | Not Tracked | Not Tracked | |

Table A6 - Fish - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| **Trouts** | | | | | | |
| *Oncorhynchus clarki pleuriticus* | Colorado River Cutthroat Trout | | SC | G4T3 | S3 | X |
| *Oncorhynchus clarki stomias* | Greenback Cutthroat Trout | T | T | G4T2T3 | S2 | X |
| *Oncorhynchus clarki virginalis* | Rio Grande Cutthroat Trout | | SC | G4T3 | S3 | X |

1/ Added as a result of review by the scientists participating in the Questionnaire and Science Forum.

Table A7 - Birds - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| **Grebes** | | | | | | |
| *Podiceps nigricollis* | Eared Grebe | | | | | 1/ |
| *Aechmophorus occidentalis* | Western Grebe | | | | | 1/ |
| **Pelicans** | | | | | | |
| *Pelecanus erythrorhynchos* | American White Pelican | | | G3 | S1B | X |
| **Herons** | | | | | | |
| *Botaurus lentiginosus* | American Bittern | | | Not Tracked | Not Tracked | X |
| *Egretta thula* | Snowy Egret | | | G5 | S2B | X |
| *Plegadis chihi* | White-faced Ibis | | | G5 | S2B | X |
| **Swans, Geese, and Ducks** | | | | | | |
| *Aythya affinis* | Lesser Scaup | | | Not Tracked | Not Tracked | X |
| *Anas acuta* | Northern Pintail | | | Not Tracked | Not Tracked | X |
| *Bucephala islandica* | Barrow's Goldeneye | | | | | 1/ |
| **Kites, Eagles, and Hawks** | | | | | | |
| *Pandion haliaetus* | Osprey | | | Not Tracked | Not Tracked | X |
| *Haliaeetus leucocephalus* | Bald Eagle | X | T | G4 | S1B,S3N | |
| *Circus cyaneus* | Northern Harrier | | | Not Tracked | Not Tracked | X |
| *Accipiter gentilis* | Northern Goshawk | | | G5 | S3B | X |
| *Buteo swainsoni* | Swainson's Hawk | | | Not Tracked | Not Tracked | X |
| *Buteo regalis* | Ferruginous Hawk | | SC | G4 | S3B,S4N | |
| *Aquila chrysaetos* | Golden Eagle | | | Not Tracked | Not Tracked | X |
| **Falcons** | | | | | | |
| *Falco peregrinus anatum* | American Peregrine Falcon | | SC | G4T3 | S2B | |
| *Falco mexicanus* | Prairie Falcon | | | Not Tracked | Not Tracked | X NatureServe G5 |
| **Partridges, Grouse, Turkeys, and Quail** | | | | | | |
| *Centrocercus urophasianus* | Greater Sage-Grouse | | SC | Not Tracked | Not Tracked | NatureServe G4 |
| *Centrocercus minimus* | Gunnison Sage Grouse | | SC | G1 | S1 | |
| *Lagopus leucurus* | White-tailed Ptarmigan | | | | | 1/ |

Table A7 - Birds - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| *Tympanuchus cupido* | Greater Prairie Chicken | | | Not Tracked | Not Tracked | X |
| *Dendragapus obscurus* | Blue Grouse | | | Not Tracked | Not Tracked | X |
| *Typanuchus phasianellus columbianus* | Columbian Sharp-tailed Grouse | | SC | G4T3 | S2 | |
| *Tympanuchus phasianellus jamesii* | Plains Sharp-tailed Grouse | | E | G4T4 | S1 | |
| *Tympanuchus pallidicinctus* | Lesser Prairie-chicken | | T | G3 | S2 | |
| *Callipepla squamata* | Scaled Quail | | | Not Tracked | Not Tracked | X |
| **Rails, Gallinules, and Coots** | | | | | | |
| *Laterallus jamaicensis* | Black Rail | | | | | 1/ |
| **Cranes** | | | | | | |
| *Grus canadensis tabida* | Greater Sandhill Crane | | SC | G5T4 | S2B, S4N | |
| *Grus americana* | Whooping Crane | E | E | Not Tracked | Not Tracked | |
| **Plovers** | | | | | | |
| *Charadrius alexandrinus nivosus* | Western Snowy Plover | | SC | G4T3 | S1B | |
| *Charadrius melodus* | Piping Plover | T | T | G3 | S1B | |
| *Charadrius montanus* | Mountain Plover | | SC | G2 | S2B | |
| **Sandpipers and Phalaropes** | | | | | | |
| *Bartramia longicauda* | Upland Sandpiper | | | Not Tracked | Not Tracked | X |
| *Numenius americanus* | Long-billed Curlew | | SC | G5 | S2B | X |
| *Limosa fedoa* | Marbled Godwit | | | | | X |
| *Phalaropus tricolor* | Wilson's Phalarope | | | Not Tracked | Not Tracked | X |
| **Jaegers, Gulls, and Terns** | | | | | | |
| *Sterna forsteri* | Forster's Tern | | | | | 1/ |
| *Sterna antillarum* | Least Tern | E | E | G4 | S1B | |
| **Pigeons and Doves** | | | | | | |
| *Patagioenas fasciata* | Band-tailed Pigeon | | | Not Tracked | Not Tracked | X |
| **Cuckoos, Roadrunners, and Anis** | | | | | | |

Table A7 - Birds - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| *Coccyzus americanus* | Western Yellow-billed Cuckoo | | SC | Not Tracked | Not Tracked | |
| **Owls** | | | | | | |
| *Athene cunicularia hypugaea* | Western Burrowing Owl | | T | Not Tracked | Not Tracked | X |
| *Otus flammeolus* | Flammulated Owl | | | Not Tracked | Not Tracked | X |
| *Strix occidentalis lucida* | Mexican Spotted Owl | T | T | G3T3 | S1B,SUN | |
| *Asio flammeus* | Short-eared Owl | | | G5 | S2B | X |
| *Aegolius funereus* | Boreal Owl | | | | | 1/ |
| **Swifts** | | | | | | |
| *Cypseloides niger* | Black Swift | | | G4 | S3B | X |
| *Aeronautes saxatalis* | White-throated Swift | | | Not Tracked | Not Tracked | X |
| **Hummingbirds** | | | | | | |
| *Archilochus alexandri* | Black-chinned Hummingbird | | | Not Tracked | Not Tracked | X |
| *Selasphorus platycercus* | Broad-tailed Hummingbird | | | Not Tracked | Not Tracked | X |
| *Selasphorus rufus* | Rufous Hummingbird | | | Not Tracked | Not Tracked | X |
| **Woodpeckers** | | | | | | |
| *Melanerpes lewis* | Lewis's Woodpecker | | | Not Tracked | Not Tracked | X |
| *Sphyrapicus thyroideus* | Williamson's Sapsucker | | | Not Tracked | Not Tracked | X |
| *Sphyrapicus nuchalis* | Red-naped Sapsucker | | | Not Tracked | Not Tracked | X |
| *Picoides dorsalis* | American Three-toed Woodpecker | | | | | 1/ |
| **Flycatchers** | | | | | | |
| *Contopus cooperi* | Olive-sided Flycatcher | | | Not Tracked | Not Tracked | X |
| *Empidonax trailli extimus* | Southwestern Willow Flycatcher | E | E | Not Tracked | Not Tracked | |
| *Empidonax wrightii* | Gray Flycatcher | | | Not Tracked | Not Tracked | X |
| *Empidonax oberholseri* | Dusky Flycatcher | | | Not Tracked | Not Tracked | X |
| *Empidonax occidentalis* | Cordilleran Flycatcher | | | Not Tracked | Not Tracked | X |
| **Shrikes** | | | | | | |

Table A7 - Birds - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| *Lanius ludovicianus* | Loggerhead Shrike | | | | | 1/ |
| **Vireos** | | | | | | |
| *Vireo vicinior* | Gray Vireo | | | G4 | S2B | X |
| **Jays, Magpies, and Crows** | | | | | | |
| *Gymnorhinus cyanocephalus* | Pinyon Jay | | | Not Tracked | Not Tracked | X |
| **Swallows** | | | | | | |
| *Progne subis hesperia* | Western Purple Martin | | | | | 1/ |
| **Chickadees and Titmice** | | | | | | |
| *Baeolophus ridgwayi* | Juniper Titmouse | | | Not Tracked | Not Tracked | X |
| **Nutchatches** | | | | | | |
| *Sitta pygmaea* | Pygmy Nuthatch | | | Not Tracked | Not Tracked | X |
| **Dippers** | | | | | | |
| *Cinclus mexicanus* | American Dipper | | | Not Tracked | Not Tracked | X |
| **Kinglets, Gnatcatchers, and Thrushes** | | | | | | |
| *Catharus fuscecens* | Veery | | | | | 1/ |
| *Toxostoma curvirostre* | Curve-billed Thrasher | | | | | X |
| **Wood-Warblers** | | | | | | |
| *Vermivora virginiae* | Virginia's Warbler | | | Not Tracked | Not Tracked | X |
| *Dendroica nigrescens* | Black-throated Gray Warbler | | | Not Tracked | Not Tracked | X |
| *Dendroica graciae* | Grace's Warbler | | | G5 | S3B | X |
| **New World Sparrows** | | | | | | |
| *Aimophila cassinii* | Cassin's Sparrow | | | Not Tracked | Not Tracked | X |
| *Spizella breweri* | Brewer's Sparrow | | | Not Tracked | Not Tracked | X |
| *Amphispiza belli* | Sage Sparrow | | | G5 | S3B | X |
| *Calamospiza melanocorys* | Lark Bunting | | | Not Tracked | Not Tracked | X |
| *Pooecetes gramineus* | Vesper Sparrow | | | | | 1/ |
| *Zonotrichia querula* | Harris' Sparrow | | | | | X |
| *Calcarius mccownii* | McCown's Longspur | | | G5 | S2B | X |
| *Calcarius ornatus* | Chestnut-collared Longspur | | | G5 | S1B | X |
| **Grosbeaks and Buntings** | | | | | | |

Table A7 - Birds - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | **Fed T/E/C** | **State T/E/SC** | **CNHP G1, G2 or G3** | **S1 or S2 AND G4** | **Rangewide assessment** |
| *Passerina amoena* | Lazuli Bunting | | | Not Tracked | Not Tracked | X |
| **Blackbirds and Orioles** | | | | | | |
| *Dolichonyx oryzivorus* | Bobolink | | | G5 | S3B | X |
| **Finches** | | | | | | |
| *Leucosticte atrata* | Black Rosy-Finch | | | Not Tracked | Not Tracked | X |
| *Leucosticte australis* | Brown-capped Rosy-Finch | | | G4 | S3B, S4N | X |
| *Coccothraustes vespertinus* | Evening Grosbeak | | | | | 1/ |
| *Carpodacus cassinii* | Cassin's Finch | | | Not Tracked | Not Tracked | X |
| *Loxia curvirostra* | Red Crossbill | | | | | X |

1/ Added as a result of review by the scientists participating in the Questionnaire and Science Forum.

Table A8 - Mammals - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T/E/C | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| **Shrews** | | | | | | |
| *Sorex nanus* | Dwarf Shrew | | | G4 | S2 | |
| *Sorex preblei* | Preble's Shrew | | | G4 | S1 | |
| **Bats** | | | | | | |
| *Euderma maculatum* | Spotted Bat | | | G4 | S2 | |
| *Idionycteris phyllotis* | Allen's big-eared bat | C | | G3/G4 NMHP | S2 | |
| *Myotis occultus* | Arizona myotis | | | G5/T3/T4 | S3 | X |
| *Myotis thysanodes* | Fringed myotis | C | | G4/G5 | S3 | X |
| *Plecotus (Choynorhinus) townsendii pallescens* | Townsend's Big-eared Bat Subsp | | SC | G4T4 | S2 | |
| **Rabbits and Hares** | | | | | | |
| *Lepus townsendii* | White-tailed Jackrabbit | | | Not Tracked | Not Tracked | X |
| **Squirrels** | | | | | | |
| *Cynomys gunnisoni* | Gunnison prairie dog | | | | | 1/ |
| *Cynomys leucurus* | White-tailed prairie dog | | | | | 1/ |
| *Cynomys ludovicianus* | Black-tailed prairie dog | | SC | G3 | Not Tracked | NatureServe G3 |
| **Pocket Gophers** | | | | | | |
| *Thomomys bottae rubidus* | Botta's Pocket Gopher (rubidus ssp) | | SC | G5T1 | S1 | |
| *Thomomys talpoides macrotis* | Northern pocket gopher (macrotis ssp) | | SC | G5T1 | S1 | |
| *Perognathus fasciatus* | Olive-backed pocket mouse | | | | | 1/ |
| **Jumping Mice** | | | | | | |
| *Zapus hudsonius* | Meadow Jumping Mouse (both subspecies) | T | T | G5T2 | S1 | |
| **Dogs and Allies** | | | | | | |
| *Canis lupus* | Gray Wolf - two subspecies (Northern and Mexican) | E | E | Not Tracked | Not Tracked | |
| *Vulpes macrotis* | Kit Fox | | E | G4 | S1 | |
| *Vulpes velox* | Swift Fox | | SC | G3 | S3 | |

Table A8 - Mammals - Species of greatest conservation concern (Science Forum Results).

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | **Fed T/E/C** | **State T/E/SC** | **CNHP G1, G2 or G3** | **S1 or S2 AND G4** | **Rangewide assessment** |
| **Bears** | | | | | | |
| *Ursus arctos* | Grizzly bear | T | T3/T4X | G4 | Not Tracked | |
| **Weasels and Allies** | | | | | | |
| *Conepatus leuconotus* | Common Hog-nosed Skunk | | | G4 | S1 | |
| *Gulo gulo* | Wolverine | | E | G4 | S1 | |
| *Lontra canadensis* | River Otter | | T | Not Tracked | Not Tracked | |
| *Mustela nigripes* | Black-footed Ferret | E | E | G1 | S1 | |
| **Cattle and Allies** | | | | | | |
| *Bison bison* | Bison | | | G1 or G2 (pending) | | |
| *Ovis canadensis* | Bighorn sheet | | | | | 2/ |
| **Cats** | | | | | | |
| *Lynx canadensis* | Lynx | T | E | G5 | S1 | |

1/ Added as a result of review by the scientists participating in the Questionnaire and Science Forum.
2/ Added by CDOW to ensure consideration in federal land management planning and decisions.

Table A9 – Additional species recommended for addition to the list of species of greatest conservation concern during review of the draft plan (all recommended because they appear on other lists of species of concern, management indicator species, etc). They did not meet the inclusion criteria, and are not included in the 2005 CWCS.

| Scientific Name | Common Name | Criteria for inclusion or exclusion. | | | | |
|---|---|---|---|---|---|---|
| | | Fed T or E | State T/E/SC | CNHP G1, G2 or G3 | S1 or S2 AND G4 | Rangewide assessment |
| **Insects** | | | | | | |
| *Somatochlora hudsonica* [1/] | Hudsonian emerald | | | | | U.S. For. Svc. Region 2 Sensitive |
| **Reptiles** | | | | | | |
| *Lampropeltis triangulum taylori* [2/] | milk snake | | | | | CO Bur. Land Mgt. Sensitive |
| *Sceloporus magister* [2/] | spiny lizard | | | | | CO Bur. Land Mgt. Sensitive |
| **Amphibians** | | | | | | |
| *Spea intermontana* [2/] | Great Basin spadefoot | | | | | CO Bur. Land Mgt. Sensitive |
| **Fish** | | | | | | |
| *Fundulus sciadicus* [2/] | Plains topminnow | | | | | CO Bur. Land Mgt. Sensitive |
| *Hybopsis gracilis* [2/] | Flathead chub | | | | | CO Bur. Land Mgt. Sensitive |
| *Nocomis biguttatus* [1/] | hornyhead chub | | | | | CO Bur. Land Mgt. Sensitive |
| *Notropis blennius* [2/] | river shiner | | | | | CO Bur. Land Mgt. Sensitive |
| **Birds** | | | | | | |
| *Ammodramus savannarum* [1/] | grasshopper sparrow | | | | | U.S. For. Svc. Region 2 Sensitive |
| *Chlidonias niger* [1/] [2/] | black tern | | | | | U.S. For. Svc. Region 2 Sensitive |
| *Cygnus buccinator* [1/] | trumpeter swan | | | | | U.S. For. Svc. Region 2 Sensitive |
| *Histrionicus histrionicus* [1/] | harlequin duck | | | | | U.S. For. Svc. Region 2 Sensitive |
| **Mammals** | | | | | | |
| *Martes Americana* [1/] | American marten | | | | | U.S. For. Svc. Region 2 Sensitive |
| *Myotis yumanensis* [2/] | Yuma myotis | | | | | CO Bur. Land Mgt. Sensitive |
| *Nyctinomops macrotis* [2/] | free-tailed bat | | | | | CO Bur. Land Mgt. Sensitive |
| *Sorex hoyi* [1/] | pygmy shrew | | | | | U.S. For. Svc. Region 2 Sensitive |

[1/] USDA Forest Service Region 2 – Sensitive
[2/] Colorado Bureau of Land Management - Sensitive

# Appendix B

## Relative Condition of Key Habitats in Colorado

Table B1 - Mollusks - Relative Condition of Key Habitats in Colorado (Science Forum Results).

| Habitat Category | Land Cover Type | | Habitat Condition Status<br>What is it now? | | | | Habitat Condition Trend<br>Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Urban and Croplands | Urban | | | | | | | | | |
| | Dryland Crops | | | | | | | | | |
| | Irrigated Crops | | | | | | | | | |
| Riparian / Wetlands | Open Water | | | X | | | | X | | |
| | Shrub-dominated Wetlands | | | X | | | X | | | |
| | Grass/Forb Dominated Wetlands | | | | | X | X | | | |
| | Eastern Plains Rivers | | X | | | | X | | | |
| | Eastern Plains Streams | | X | | | | X | | | |
| | Transition Streams | | X | | | | X | | | |
| | Mountain Streams | | | X | | | | X | | |
| | West Slope Rivers | | | X | | | X | | | |
| | West Slope Streams | | | X | | | X | | | |
| | Playas | | | | | | | | | |
| Grasslands | Tallgrass Prairie | | | | | | | | | |
| | Midgrass Prairie | | | | | | | | | |
| | Shortgrass Prairie | | | | | | | | | |
| | Foothill / Mountain Grassland | | | | | | | | | |
| | Sand Dune Complex (Grassland) | | | | | | | | | |
| Shrublands | Upland Shrub | | | | | | | | | |
| | Deciduous Oak | | | | | | | | | |
| | Sagebrush | | | | | | | | | |
| | Desert Shrub | | | | | | | | | |
| | Saltbrush Fans & Flats | | | | | | | | | |
| | Greasewood Fans & Flats | | | | | | | | | |
| | Sand Dune Complex (Shrubland) | | | | | | | | | |
| Forestlands | Aspen Forest | | | | | | | | | |
| | Spruce-Fir | | | | | | | | | |
| | Douglas Fir | | | | | | | | | |

Table B1 - Mollusks - Relative Condition of Key Habitats in Colorado (Science Forum Results).

| Habitat Category | Land Cover Type | | Habitat Condition Status<br>What is it now? | | | | Habitat Condition Trend<br>Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| | Lodgepole Pine | | | | | | | | | |
| | Limber Pine | | | | | | | | | |
| | Ponderosa Pine | | | | | | | | | |
| | White Fir | | | | | | | | | |
| | Pinyon-Juniper | | | | | | | | | |
| | Rocky Mountain Bristlecone Pine | | | | | | | | | |
| | Mixed Conifer | | | | | | | | | |
| | Mixed Forest | | | | | | | | | |
| Tundra | Shrub Tundra | | | | | | | | | |
| | Meadow Tundra | | | | | | | | | |
| Unvegetated | Sandy Areas | | | | | | | | | |
| | Exposed Rock | | | | | | | | | |
| Lakes | Added at Science Forum | | | X | | | | X | | |

Table B2 - Insects - Relative Condition of Key Habitats in Colorado (Science Forum Results).

| Habitat Category | Land Cover Type | | Habitat Condition Status<br>What is it now? | | | | Habitat Condition Trend<br>Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Urban and Croplands | Urban | | | | | X | | | X | |
| | Dryland Crops | | | | | X | | | | X |
| | Irrigated Crops | | | | | X | | | | X |
| Riparian / Wetlands | Open Water | | | X | | | | X | | |
| | Shrub-dominated Wetlands | | | X | | | X | | | |
| | Grass/Forb Dominated Wetlands | | | X | | | X | | | |
| | Eastern Plains Rivers | | X | | | | X | | | |
| | Eastern Plains Streams | | X | | | | X | | | |
| | Transition Streams | | | X | | | X | | | |
| | Mountain Streams | | | X | | | | X | | |
| | West Slope Rivers | | | X | | | X | | | |
| | West Slope Streams | | | X | | | X | | | |
| | Playas | | | | | X | X | | | |
| Grasslands | Tallgrass Prairie | | X | | | | X | | | |
| | Midgrass Prairie | | | | | X | | | | X |
| | Shortgrass Prairie | | | X | | | X | | | |
| | Foothill / Mountain Grassland | | | X | | | X | | | |
| | Sand Dune Complex (Grassland) | | | | | X | | | | X |
| Shrublands | Upland Shrub | | | | | X | | | | X |
| | Deciduous Oak | | | X | | | | X | | |
| | Sagebrush | | X | | | | | X | | |
| | Desert Shrub | | | X | | | | | | X |
| | Saltbrush Fans & Flats | | | X | | | | X | | |
| | Greasewood Fans & Flats | | X | | | | | X | | |
| | Sand Dune Complex (Shrubland) | | | | | X | | | | X |
| Forestlands | Aspen Forest | | | X | | | | | | X |
| | Spruce-Fir | | | | | X | | X | | |

Table B2 - Insects - Relative Condition of Key Habitats in Colorado (Science Forum Results).

| Habitat Category | Land Cover Type | | Habitat Condition Status — What is it now? | | | | Habitat Condition Trend — Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| | Douglas Fir | | | X | | | | X | | |
| | Lodgepole Pine | | | | | X | | | | X |
| | Limber Pine | | | | | X | | | | X |
| | Ponderosa Pine | | | X | | | | X | | |
| | White Fir | | | | | X | | | | X |
| | Pinyon-Juniper | | X | | | | X | | | |
| | Rocky Mountain Bristlecone Pine | | | | | X | | | | X |
| | Mixed Conifer | | | | | X | | X | | |
| | Mixed Forest | | | | | X | | | | X |
| Tundra | Shrub Tundra | | | | | X | | | | X |
| | Meadow Tundra | | | | | X | | | | X |
| Unvegetated | Sandy Areas | | | | | X | | | | X |
| | Exposed Rock | | | | | X | | | | X |

* This group at the Science Forum ranked habitat types instead of just voting for them

Table B3 - Amphibians and Reptiles - Relative Condition of Key Habitats in Colorado (Science Forum Results).

| Habitat Category | Land Cover Type | Vote | Habitat Condition Status — What is it now? | | | | Habitat Condition Trend — Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Urban and Croplands | Urban | | | | | | | | | |
| | Dryland Crops | | | | | | | | | |
| | Irrigated Crops | * | | | | | | | | |
| Riparian / Wetlands | Open Water | * | | X | | | X | | | |
| | Shrub-dominated Wetlands | * | | X | | | X | | | |
| | Grass/Forb Dominated Wetlands | * | | X | | | X | | | |
| | Eastern Plains Rivers | * | X | | | | X | | | |
| | Eastern Plains Streams | * | | X | | | X | | | |
| | Transition Streams | * | | X | | | X | | | |
| | Mountain Streams | * | | X | | | | X | | |
| | West Slope Rivers | * | | | | X | | | | X |
| | West Slope Streams | * | | | | X | | | | X |
| | Playas | * | | X | | | | X | | |
| Grasslands | Tallgrass Prairie | | | | | | | | | |
| | Midgrass Prairie | * | X | | | | X | | | |
| | Shortgrass Prairie | * | | X | | | X | | | |
| | Foothill / Mountain Grassland | | | | | | | | | |
| | Sand Dune Complex (Grassland) | | | | | | | | | |
| Shrublands | Upland Shrub | | | | | | | | | |
| | Deciduous Oak | | | | | | | | | |
| | Sagebrush | * | X | | | | X | | | |
| | Desert Shrub | * | | X | | | | | | X |
| | Saltbrush Fans & Flats | * | | X | | | | X | | |
| | Greasewood Fans & Flats | * | | | | X | | | | X |
| | Sand Dune Complex (Shrubland) | | | | | | | | | |

Table B3 - Amphibians and Reptiles - Relative Condition of Key Habitats in Colorado (Science Forum Results).

| Habitat Category | Land Cover Type | Vote | Habitat Condition Status — What is it now? | | | | Habitat Condition Trend — Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Forestlands | Aspen Forest | * | | X | | | X | | | |
| | Spruce-Fir | * | | | | X | | | | X |
| | Douglas Fir | | | | | | | | | |
| | Lodgepole Pine | * | | | | X | | | | X |
| | Limber Pine | | | | | | | | | |
| | Ponderosa Pine | | | | | | | | | |
| | White Fir | | | | | | | | | |
| | Pinyon-Juniper | | | | | | | | | |
| | Rocky Mountain Bristlecone Pine | | | | | | | | | |
| | Mixed Conifer | * | | | | X | | | | X |
| | Mixed Forest | | | | | | | | | |
| Tundra | Shrub Tundra | | | | | | | | | |
| | Meadow Tundra | | | | | | | | | |
| Unvegetated | Sandy Areas | * | | X | | | | X | | |
| | Exposed Rock | | | | | | | | | |

* This group at the Science Forum highlighted the most important land cover types and did not record actual votes.

Table B4 - Fish - Relative Condition of Key Habitats in Colorado (Science Forum Results).

The "vote" column represents the outcome of multi-voting by the experts at the Science Forum (in this case using the number of items on their list divided by three). Multi-voting is a way for groups to express their collective judgment about the habitats that are most important for the species of greatest conservation concern in this species group. Members of the species workgroup, after listing all the habitats of importance, were given multiple votes (number of species divided by three) and asked to allocate their votes as a personal assessment of importance. The sum of all votes was then used to capture the collective assessment of the group. After this voting was complete, an opportunity for discussion of the results was provided. The larger the number the larger the importance.

| Habitat Category | Land Cover Type | Vote | Habitat Condition Status<br>What is it now? | | | | Habitat Condition Trend<br>Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Urban and Croplands | Urban | | | | | | | | | |
| | Dryland Crops | | | | | | | | | |
| | Irrigated Crops | | | | | | | | | |
| Riparian / Wetlands | Open Water | | | X | | | | X | | |
| | Shrub-dominated Wetlands | | | X | | | X | | | |
| | Grass/Forb Dominated Wetlands | | | | | X | X | | | |
| | Eastern Plains Rivers | 1 | X | | | | X | | | |
| | Eastern Plains Streams | 1 | X | | | | X | | | |
| | Transition Streams | | | X | | | X | | | |
| | Mountain Streams | | | X | | | | X | | |
| | West Slope Rivers | | | X | | | X | | | |
| | West Slope Streams | 1 | | X | | | X | | | |
| | Playas | | | | | | | | | |
| Grasslands | Tallgrass Prairie | | | | | | | | | |
| | Midgrass Prairie | | | | | | | | | |
| | Shortgrass Prairie | | | | | | | | | |
| | Foothill / Mountain Grassland | | | | | | | | | |
| | Sand Dune Complex (Grassland) | | | | | | | | | |
| Shrublands | Upland Shrub | | | | | | | | | |
| | Deciduous Oak | | | | | | | | | |
| | Sagebrush | | | | | | | | | |
| | Desert Shrub | | | | | | | | | |
| | Saltbrush Fans & Flats | | | | | | | | | |
| | Greasewood Fans & Flats | | | | | | | | | |
| | Sand Dune Complex (Shrubland) | | | | | | | | | |

Table B4 - Fish - Relative Condition of Key Habitats in Colorado (Science Forum Results).

The "vote" column represents the outcome of multi-voting by the experts at the Science Forum (in this case using the number of items on their list divided by three). Multi-voting is a way for groups to express their collective judgment about the habitats that are most important for the species of greatest conservation concern in this species group. Members of the species workgroup, after listing all the habitats of importance, were given multiple votes (number of species divided by three) and asked to allocate their votes as a personal assessment of importance. The sum of all votes was then used to capture the collective assessment of the group. After this voting was complete, an opportunity for discussion of the results was provided. The larger the number the larger the importance.

| Habitat Category | Land Cover Type | Vote | Habitat Condition Status<br>What is it now? | | | | Habitat Condition Trend<br>Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Forestlands | Aspen Forest | | | | | | | | | |
| | Spruce-Fir | | | | | | | | | |
| | Douglas Fir | | | | | | | | | |
| | Lodgepole Pine | | | | | | | | | |
| | Limber Pine | | | | | | | | | |
| | Ponderosa Pine | | | | | | | | | |
| | White Fir | | | | | | | | | |
| | Pinyon-Juniper | | | | | | | | | |
| | Rocky Mountain Bristlecone Pine | | | | | | | | | |
| | Mixed Conifer | | | | | | | | | |
| | Mixed Forest | | | | | | | | | |
| Tundra | Shrub Tundra | | | | | | | | | |
| | Meadow Tundra | | | | | | | | | |
| Unvegetated | Sandy Areas | | | | | | | | | |
| | Exposed Rock | | | | | | | | | |
| Lakes | Added at Science Forum | | | X | | | | X | | |

Table B5 - Birds - Relative Condition of Key Habitats in Colorado (Science Forum Results).

The "vote" column represents the outcome of multi-voting by the experts at the Science Forum (in this case using the number of items on their list divided by three). Multi-voting is a way for groups to express their collective judgment about the habitats that are most important for the species of greatest conservation concern in this species group. Members of the species workgroup, after listing all the habitats of importance, were given multiple votes (number of species divided by three) and asked to allocate their votes as a personal assessment of importance. The sum of all votes was then used to capture the collective assessment of the group. After this voting was complete, an opportunity for discussion of the results was provided. The larger the number the larger the importance.

| Habitat Category | Land Cover Type | Vote | Habitat Condition Status — What is it now? | | | | Habitat Condition Trend — Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Urban and Croplands | Urban | | | X | | | | | X | |
| | Dryland Crops | | | X | | | | X | | |
| | Irrigated Crops | | | X | | | | X | | |
| Riparian / Wetlands | Open Water | | | X | | | | X | | |
| | Shrub-dominated Wetlands | 2 | | | | X | X | | | |
| | Grass/Forb Dominated Wetlands | 5 | | X | | | X | | | |
| | Eastern Plains Rivers | 6 | X | | | | X | | | |
| | Eastern Plains Streams | 4 | X | | | | X | | | |
| | Transition Streams | 1 | X | | | | X | | | |
| | Mountain Streams | | | X | | | | X | | |
| | West Slope Rivers | 5 | X | | | | X | | | |
| | West Slope Streams | 4 | X | | | | X | | | |
| | Playas | 6 | X | | | | X | | | |
| Grasslands | Tallgrass Prairie | | X | | | | X | | | |
| | Midgrass Prairie | 5 | X | | | | X | | | |
| | Shortgrass Prairie | 6 | | X | | | X | | | |
| | Foothill / Mountain Grassland | 3 | | X | | | X | | | |
| | Sand Dune Complex (Grassland) | | | X | | | | | | X |
| Shrublands | Upland Shrub | | | X | | | X | | | |
| | Deciduous Oak | | | X | | | | X | | |
| | Sagebrush | 6 | X | | | | X | | | |
| | Desert Shrub | | | X | | | X | | | |
| | Saltbrush Fans & Flats | | | X | | | X | | | |
| | Greasewood Fans & Flats | | | X | | | X | | | |
| | Sand Dune Complex (Shrubland) | | | | | X | | | | X |

Table B5 - Birds - Relative Condition of Key Habitats in Colorado (Science Forum Results).

The "vote" column represents the outcome of multi-voting by the experts at the Science Forum (in this case using the number of items on their list divided by three). Multi-voting is a way for groups to express their collective judgment about the habitats that are most important for the species of greatest conservation concern in this species group. Members of the species workgroup, after listing all the habitats of importance, were given multiple votes (number of species divided by three) and asked to allocate their votes as a personal assessment of importance. The sum of all votes was then used to capture the collective assessment of the group. After this voting was complete, an opportunity for discussion of the results was provided. The larger the number the larger the importance.

| Habitat Category | Land Cover Type | Vote | Habitat Condition Status<br>What is it now? | | | | Habitat Condition Trend<br>Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Forestlands | Aspen Forest | 5 | | X | | | X | | | |
| | Spruce-Fir | | | X | | | | X | | |
| | Douglas Fir | 4 | | X | | | X | | | |
| | Lodgepole Pine | | | | X | | | X | | |
| | Limber Pine | | | X | | | | X | | |
| | Ponderosa Pine | 5 | X | | | | X | | | |
| | White Fir | | | X | | | | | X | |
| | Pinyon-Juniper | 6 | X | | | | X | | | |
| | Rocky Mountain Bristlecone Pine | | | X | | | | X | | |
| | Mixed Conifer | 2 | | X | | | | X | | |
| | Mixed Forest | | | | | X | | | | X |
| Tundra | Shrub Tundra | | | X | | | | X | | |
| | Meadow Tundra | | | X | | | | X | | |
| Unvegetated | Sandy Areas | | | | | X | | | | X |
| | Exposed Rock | | | | X | | | X | | |

Table B6 - Mammals - Relative Condition of Key Habitats in Colorado (Science Forum Results).

The "vote" column represents the outcome of multi-voting by the experts at the Science Forum (in this case using the number of items on their list divided by three). Multi-voting is a way for groups to express their collective judgment about the habitats that are most important for the species of greatest conservation concern in this species group. Members of the species workgroup, after listing all the habitats of importance, were given multiple votes (number of species divided by three) and asked to allocate their votes as a personal assessment of importance. The sum of all votes was then used to capture the collective assessment of the group. After this voting was complete, an opportunity for discussion of the results was provided. The larger the number the larger the importance.

| Habitat Category | Land Cover Type | Vote | Habitat Condition Status<br>What is it now? | | | | Habitat Condition Trend<br>Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Urban and Croplands | Urban | | X | | | | | | X | |
| | Dryland Crops | | | | | X | | X | | |
| | Irrigated Crops | | | | | X | X | | | |
| Riparian / Wetlands | Open Water | | | X | | | | X | | |
| | Shrub-dominated Wetlands | 2 | | X | | | X | | | |
| | Grass/Forb Dominated Wetlands | | | X | | | X | | | |
| | Eastern Plains Rivers | | X | | | | X | | | |
| | Eastern Plains Streams | 1 | X | | | | X | | | |
| | Transition Streams | 1 | | X | | | | X | | |
| | Mountain Streams | 3 | | X | | | | X | | |
| | West Slope Rivers | 2 | | X | | | X | | | |
| | West Slope Streams | 2 | | X | | | | X | | |
| | Playas | | | | | X | X | | | |
| Grasslands | Tallgrass Prairie | | | X | | | X | | | |
| | Midgrass Prairie | 3 | | X | | | X | | | |
| | Shortgrass Prairie | 6 | | X | | | X | | | |
| | Foothill / Mountain Grassland | 3 | | X | | | X | | | |
| | Sand Dune Complex (Grassland) | | X | | | | X | | | |
| Shrublands | Upland Shrub | 1 | | X | | | X | | | |
| | Deciduous Oak | 1 | | X | | | X | | | |
| | Sagebrush | 3 | | X | | | X | | | |
| | Desert Shrub | 1 | | X | | | | X | | |
| | Saltbrush Fans & Flats | | | X | | | | X | | |
| | Greasewood Fans & Flats | | | X | | | | X | | |
| | Sand Dune Complex (Shrubland) | 2 | | X | | | X | | | |

Table B6 - Mammals - Relative Condition of Key Habitats in Colorado (Science Forum Results).

The "vote" column represents the outcome of multi-voting by the experts at the Science Forum (in this case using the number of items on their list divided by three). Multi-voting is a way for groups to express their collective judgment about the habitats that are most important for the species of greatest conservation concern in this species group. Members of the species workgroup, after listing all the habitats of importance, were given multiple votes (number of species divided by three) and asked to allocate their votes as a personal assessment of importance. The sum of all votes was then used to capture the collective assessment of the group. After this voting was complete, an opportunity for discussion of the results was provided. The larger the number the larger the importance.

| Habitat Category | Land Cover Type | Vote | Habitat Condition Status<br>What is it now? | | | | Habitat Condition Trend<br>Is it changing? | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Poor | Good | Excellent | Unknown | Declining | Stable | Increasing | Unknown |
| Forestlands | Aspen Forest | 1 | | X | | | | X | | |
| | Spruce-Fir | 1 | | X | | | X | | | |
| | Douglas Fir | 1 | | X | | | | X | | |
| | Lodgepole Pine | | | X | | | | X | | |
| | Limber Pine | | | | X | | | X | | |
| | Ponderosa Pine | 3 | X | | | | X | | | |
| | White Fir | | | X | | | | X | | |
| | Pinyon-Juniper | 5 | | X | | | | X | | |
| | Rocky Mountain Bristlecone Pine | | | X | | | | X | | |
| | Mixed Conifer | 3 | | X | | | | X | | |
| | Mixed Forest | | | | | X | | | | X |
| Tundra | Shrub Tundra | | | X | | | | X | | |
| | Meadow Tundra | | | X | | | | | X | |
| Unvegetated | Sandy Areas | | | | X | | | X | | |
| | Exposed Rock | | | X | | | | X | | |

## Appendix C

## Species Land Cover Type Associations

In the opinion of the experts in the technical questionnaire and Science Forum, the list of land cover types used here was helpful but not universally applicable. For example, for fish the participants at the Science Forum felt a more detailed stratification delineating different kinds of “open water” habitats would be helpful, specifically adding lakes as a land cover type, and there were some verbal expressions of interest in more detailed stratifications of grass lands. Consequently there is a need to maintain flexibility for re-stratifying habitat in the future to meet the unique needs of the species under consideration.

The tables that follow are a synthesis of expert opinions about the land cover types where species of conservation need are found.

Table C1, Part A - Mollusks - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| | *Acroloxus coloradensis** | Rocky Mountain Capshell | | | | | | | | | | | | | |
| | *Anodontoides ferussacianus** | Cylindrical papershell | | | | X | | | | | | | | | |
| | *Ferrissia fragilis* | | | | | | | X | | X | | | X | | |
| | *Ferrissia walkeri* | | | | | | | X | | X | | | X | | |
| | *Physa cupreonitens*** | Hot Springs Physa | | | | X | | | | | | | | | |
| | *Physa utahensis* | Banded Physa | | | | | | | | | ? | | | | |
| | *Promenetus exacuous* | | | | | | | | | | | | | | |
| | *Promenetus umbillicatellus* | | | | | | | | | | | | | | |
| | *Uniomerus tetralasmus** | Pondhorn | | | | | | | | | | | | | |
| * A new habitat type of "Lakes" was identified for this species. | | | | | | | | | | | | | | | |
| ** A new habitat type of "Hot Springs" was identified for this species. | | | | | | | | | | | | | | | |

Table C1, Part B - Mollusks - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Decidu-ous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| | *Acroloxus coloradensis** | Rocky Mountain Capshell | | | | | | | | | | | | |
| | *Anodontoides ferussacianus** | Cylindrical papershell | | | | | | | | | | | | |
| | *Ferrissia fragilis* | | | | | | | | | | | | | |
| | *Ferrissia walkeri* | | | | | | | | | | | | | |
| | *Physa cupreonitens*** | Hot Springs Physa | | | | | | | | | | | | |
| | *Physa utahensis* | Banded Physa | | | | | | | | | | | | |
| | *Promenetus exacuous* | | | | | | | | | | | | | |
| | *Promenetus umbillicatellus* | | | | | | | | | | | | | |
| | *Uniomerus tetralasmus** | Pondhorn | | | | | | | | | | | | |
| * A new habitat type of "Lakes" was identified for this species. | | | | | | | | | | | | | | |
| ** A new habitat type of "Hot Springs" was identified for this species. | | | | | | | | | | | | | | |

Table C1, Part C - Mollusks - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| | *Acroloxus coloradensis** | Rocky Mountain Capshell | | | | | | | | | | | | | | | |
| | *Anodontoides ferussacianus** | Cylindrical papershell | | | | | | | | | | | | | | | |
| | *Ferrissia fragilis* | | | | | | | | | | | | | | | | |
| | *Ferrissia walkeri* | | | | | | | | | | | | | | | | |
| | *Physa cupreonitens*** | Hot Springs Physa | | | | | | | | | | | | | | | |
| | *Physa utahensis* | Banded Physa | | | | | | | | | | | | | | | |
| | *Promenetus exacuous* | | | | | | | | | | | | | | | | |
| | *Promenetus umbillicatellus* | | | | | | | | | | | | | | | | |
| | *Uniomerus tetralasmus** | Pondhorn | | | | | | | | | | | | | | | |

* A new habitat type of "Lakes" was identified for this species.

** A new habitat type of "Hot Springs" was identified for this species.

Table C2, Part A -Insects - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| **Stoneflies (Plecoptera)** | | | | | | | | | | | | | | |
| *Capnia arapahoe* | Arapahoe snowfly | | | | | | | | | | | | | |
| *Capnia nelsoni* | Nelson's snowfly | | | | | | | | | | | | | |
| *Mesocapnia frisoni* | Plains snowfly | | | | | | | | | | | | | |
| **Mayflies (Ephemeroptera)** | | | | | | | | | | | | | | |
| *Ametropus albrighti* | Mayfly, spp. | | | | | | | | | | | | | |
| **Dragonflies and Damselflies (Odonata)** | | | | | | | | | | | | | | |
| *Argia alberta* | Paiute Dancer | | | | | | | | | | | | | |
| *Gomphus intricatus* | Brimstone Clubtail | | | | | | | | | | | | | |
| *Libellula nodisticta* | Hoary Skimmer | | | | | | | | | | | | | |
| *Somatochlora ensigera* | Lemon-faced Emerald | | | | | | | | | | | | | |
| *Sympetrum madidum* | Red-veined Meadowfly | | | | | | | | | | | | | |
| *Tetragoneuria petechialis* | Stripe-winged Baskettail | | | | | | | | | | | | | |
| **Beetles (Coleoptera)** | | | | | | | | | | | | | | |
| *Amblyderus werneri* | Great Sand Dunes Anthicid Beetle | | | | | | | | | | | | | |
| *Cicindela theatina* | San Luis Dunes Tiger Beetle | | | | | | | | | | | | | |
| **Butterflies and Moths (Lepidoptera)** | | | | | | | | | | | | | | |
| *Atrytone arogos* | Arogos Skipper | | | | | | | | | | | | | |
| *Euphyes bimacula* | Two-spotted Skipper | | | | | | X | | | | | | | |
| *Hesperia leonardus montana* | Pawnee Montane Skipper | | | | | | | | | | | | | |
| *Hesperia ottoe* | Ottoe Skipper | | | | | | | | | | | | | |
| *Polites rhesus* | Rhesus Skipper | | | | | | | | | | | | | |
| *Pyrgus xanthus* | Xanthus Skipper | | | | | | | | | | | | X | |
| *Erynnis martialis* | Mottled Duskywing | | | | | | | | | | | | | |
| **Gossamer-winged Butterflies** | | | | | | | | | | | | | | |
| *Callophrys comstocki* | Comstock's Hairstreak | | | | | | | | | | | | | |
| *Callophrys mcfarlandi* | Sandia Hairstreak | | | | | | | | | | | | | |
| *Callophrys mossii schryveri* | Moss's Elfin | | | | | | | | | | | | | |

Table C2, Part A -Insects - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| *Celastrina humulus* | Hops Feeding Azure | | | | | | | | | X | | | | |
| *Euphilotes rita coloradensis* | Colorado Blue | | | | | | | | | | | | | |
| *Euphilotes rita emmeli* | Desert Buckwheat Blue | | | | | | | | | | | | | |
| *Euphilotes spaldingi* | Spalding's Blue | | | | | | | | | | | | | |
| *Eurystrymon favonius ontario* | Northern Hairstreak | | | | | | | | X | | | | | |
| *Incisalia fotis* | Early Elfin | | | | | | | | | | | | | |
| **Brush-footed Butterflies** | | | | | | | | | | | | | | |
| *Boloria improba acrochems* | Uncompahgre fritillary | | | | | | | | | | | | | |
| *Speyeria idalia* | Regal fritillary | | | | | | X | | | | | | | |
| *Speyeria nokomis nokomis* | Great Basin Silverspot Butterfly | | | | | X | X | | | | | | | |
| **Satyrids** | | | | | | | | | | | | | | |
| *Agapema homogena* | Rocky Mountain Agapema | | | | | | | | | | | | | |
| *Anisota oslari* | Oslar's Oakworm Moth | | | | | | | | | | | | | |
| *Coloradia luski* | Lusk's Pinemoth | | | | | | | | | | | | | |
| *Hemileuca neumoegeni* | A Buckmoth | | | | | | | | | | | | | |
| **Sphinx Moths** | | | | | | | | | | | | | | |
| *Euproserpinus wiesti* | Wiest's Sphinx Moth | | | | | | | | | | | | | |
| *Proserpinus flavofasciata* | Yellow-banded Day Sphinx | | | | | | | | | | | | | |
| *Sagenosoma elsa* | A Sphinx Moth | | | | | | | | | | | | | |

Table C2, Part B -Insects - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Decidu-ous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| **Stoneflies (Plecoptera)** | | | | | | | | | | | | | |
| *Capnia arapahoe* | Arapahoe snowfly | | | | | | | | | | | | |
| *Capnia nelsoni* | Nelson's snowfly | | | | | | | | | | | | |
| *Mesocapnia frisoni* | Plains snowfly | | | | | | | | | | | | |
| **Mayflies (Ephemeroptera)** | | | | | | | | | | | | | |
| *Ametropus albrighti* | Mayfly, spp. | | | | | | | | | | | | |
| **Dragonflies and Damselflies (Odonata)** | | | | | | | | | | | | | |
| *Argia alberta* | Paiute Dancer | | | | | | | | | | | | |
| *Gomphus intricatus* | Brimstone Clubtail | | | | | | | | | | | | |
| *Libellula nodisticta* | Hoary Skimmer | | | | | | | | | | | | |
| *Somatochlora ensigera* | Lemon-faced Emerald | | | | | | | | | | | | |
| *Sympetrum madidum* | Red-veined Meadowfly | | | | | | | | | | | | |
| *Tetragoneuria petechialis* | Stripe-winged Baskettail | | | | | | | | | | | | |
| **Beetles (Coleoptera)** | | | | | | | | | | | | | |
| *Amblyderus werneri* | Great Sand Dunes Anthicid Beetle | | | | | | | | | | | | |
| *Cicindela theatina* | San Luis Dunes Tiger Beetle | | | | | | | | | | | | |
| **Butterflies and Moths (Lepidoptera)** | | | | | | | | | | | | | |
| *Atrytone arogos* | Arogos Skipper | | | | | | | | | | | | |
| *Euphyes bimacula* | Two-spotted Skipper | | | | | | | | | | | | |
| *Hesperia leonardus montana* | Pawnee Montane Skipper | | | | | | | | | | | | |
| *Hesperia ottoe* | Ottoe Skipper | X | X | | | | | | | | | | |
| *Polites rhesus* | Rhesus Skipper | | | X | X | | | | | | | | |
| *Pyrgus xanthus* | Xanthus Skipper | | | | | | | | | | | | |
| *Erynnis martialis* | Mottled Duskywing | | | | | | X | | | | | | |
| **Gossamer-winged Butterflies** | | | | | | | | | | | | | |
| *Callophrys comstocki* | Comstock's Hairstreak | | X | | | | | | | X | | | |
| *Callophrys mcfarlandi* | Sandia Hairstreak | | | X | | | | | | | | | |
| *Callophrys mossii schryveri* | Moss's Elfin | | | | | | X | | | | | | |

Table C2, Part B -Insects - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Decidu-ous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| *Celastrina humulus* | Hops Feeding Azure | | | | | | | | | | | | |
| *Euphilotes rita coloradensis* | Colorado Blue | | | X | | | | | | | | | |
| *Euphilotes rita emmeli* | Desert Buckwheat Blue | | | | | | | | | X | | | |
| *Euphilotes spaldingi* | Spalding's Blue | | | | | | | | X | | | | |
| *Eurystrymon favonius ontario* | Northern Hairstreak | | | X | | | | | | | | | |
| *Incisalia fotis* | Early Elfin | | | | | | | | | X | | | |
| **Brush-footed Butterflies** | | | | | | | | | | | | | |
| *Boloria improba acrochems* | Uncompahgre fritillary | | | | | | | | | | | | |
| *Speyeria idalia* | Regal fritillary | | | | | | | | | | | | |
| *Speyeria nokomis nokomis* | Great Basin Silverspot Butterfly | | | | | | | | | | | | |
| **Satyrids** | | | | | | | | | | | | | |
| *Agapema homogena* | Rocky Mountain Agapema | | | | | | | | | | | | |
| *Anisota oslari* | Oslar's Oakworm Moth | | | | | | | | | | | | |
| *Coloradia luski* | Lusk's Pinemoth | | | | | | | | | | | | |
| *Hemileuca neumoegeni* | A Buckmoth | | | | | | | | | | | | |
| **Sphinx Moths** | | | | | | | | | | | | | |
| *Euproserpinus wiesti* | Wiest's Sphinx Moth | | | | | X | | | | | | | |
| *Proserpinus flavofasciata* | Yellow-banded Day Sphinx | | | | | | | | | | | | |
| *Sagenosoma elsa* | A Sphinx Moth | | | | | | | | | | | | |

Table C2, Part C -Insects - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| **Stoneflies (Plecoptera)** | | | | | | | | | | | | | | | | |
| *Capnia arapahoe* | Arapahoe snowfly | | | | | | | | | | | | | | | |
| *Capnia nelsoni* | Nelson's snowfly | | | | | | | | | | | | | | | |
| *Mesocapnia frisoni* | Plains snowfly | | | | | | | | | | | | | | | |
| **Mayflies (Ephemeroptera)** | | | | | | | | | | | | | | | | |
| *Ametropus albrighti* | Mayfly, spp. | | | | | | | | | | | | | | | |
| **Dragonflies and Damselflies (Odonata)** | | | | | | | | | | | | | | | | |
| *Argia alberta* | Paiute Dancer | | | | | | | | | | | | | | | |
| *Gomphus intricatus* | Brimstone Clubtail | | | | | | | | | | | | | | | |
| *Libellula nodisticta* | Hoary Skimmer | | | | | | | | | | | | | | | |
| *Somatochlora ensigera* | Lemon-faced Emerald | | | | | | | | | | | | | | | |
| *Sympetrum madidum* | Red-veined Meadowfly | | | | | | | | | | | | | | | |
| *Tetragoneuria petechialis* | Stripe-winged Baskettail | | | | | | | | | | | | | | | |
| **Beetles (Coleoptera)** | | | | | | | | | | | | | | | | |
| *Amblyderus werneri* | Great Sand Dunes Anthicid Beetle | | | | | | | | | | | | | | | |
| *Cicindela theatina* | San Luis Dunes Tiger Beetle | | | | | | | | | | | | | | | |
| **Butterflies and Moths (Lepidoptera)** | | | | | | | | | | | | | | | | |
| *Atrytone arogos* | Arogos Skipper | | | | | | | | | | | | | | | |
| *Euphyes bimacula* | Two-spotted Skipper | | | | | | | | | | | | | | | |
| *Hesperia leonardus montana* | Pawnee Montane Skipper | | | | | | X | | | | | | | | | |
| *Hesperia ottoe* | Ottoe Skipper | | | | | | | | | | | | | | | |
| *Polites rhesus* | Rhesus Skipper | | | | | | | | | | | | | | | |
| *Pyrgus xanthus* | Xanthus Skipper | | | | | | X | | | | | | | | | |
| *Erynnis martialis* | Mottled Duskywing | | | | | | | | | | | | | | | |
| **Gossamer-winged Butterflies** | | | | | | | | | | | | | | | | |
| *Callophrys comstocki* | Comstock's Hairstreak | | | | | | | | | | | | | | | |
| *Callophrys mcfarlandi* | Sandia Hairstreak | | | | | | | | | | | | | | | |

Table C2, Part C -Insects - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| *Callophrys mossii schryveri* | Moss's Elfin | | | | | | | | | | | | | | | |
| *Celastrina humulus* | Hops Feeding Azure | | | | | | | | | | | | | | | |
| *Euphilotes rita coloradensis* | Colorado Blue | | | | | | | | | | | | | | | |
| *Euphilotes rita emmeli* | Desert Buckwheat Blue | | | | | | | | | | | | | | | |
| *Euphilotes spaldingi* | Spalding's Blue | | | | | | | | X | | | | | | | |
| *Eurystrymon favonius ontario* | Northern Hairstreak | | | | | | | | | | | | | | | |
| *Incisalia fotis* | Early Elfin | | | | | | | | X | | | | | | | |
| **Brush-footed Butterflies** | | | | | | | | | | | | | | | | |
| *Boloria improba acrochems* | Uncompahgre fritillary | | | | | | | | | | | | | | | |
| *Speyeria idalia* | Regal fritillary | | | | | | | | | | | | | | | |
| *Speyeria nokomis nokomis* | Great Basin Silverspot Butterfly | | | | | | | | | | | | | | | |
| **Brush-footed Butterflies** | | | | | | | | | | | | | | | | |
| *Agapema homogena* | Rocky Mountain Agapema | | | | | | | | | | | | | | | |
| *Anisota oslari* | Oslar's Oakworm Moth | | | | | | | | | | | | | | | |
| *Coloradia luski* | Lusk's Pinemoth | | | | | | | | | | | | | | | |
| *Hemileuca neumoegeni* | A Buckmoth | | | | | | | | | | | | | | | |
| **Sphinx Moths** | | | | | | | | | | | | | | | | |
| *Euproserpinus wiesti* | Wiest's Sphinx Moth | | | | | | | | | | | | | | | |
| *Proserpinus flavofasciata* | Yellow-banded Day Sphinx | | | | | | | | | | | | | | | |
| *Sagenosoma elsa* | A Sphinx Moth | | | | | | | | | | | | | | | |

Table C3, Part A - **Arachnids -** Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| | *Hypochilus bonneti* | A lampshade spider | | | | | | | | | | | | | |

Table C3, Part B - **Arachnids -** Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sagebrush** | **Desert Shrub** | **Saltbrush Fans & Flats** | **Greasewood Fans & Flats** | **Sand Dune Complex (Shrubland)** |
| | *Hypochilus bonneti* | A lampshade spider | | | | | | | | | | | | |

Table C3, Part C - **Arachnids -** Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| | *Hypochilus bonneti* | A lampshade spider | | | | | | | | | | | | | | | |

Table C4, Part A - Reptiles - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| **Turtles** | | | | | | | | | | | | | | |
| *Kinosternon flavescens* | Yellow mud turtle | | | | X | X | X | X | X | | | | | |
| **Lizards** | | | | | | | | | | | | | | |
| *Gambelia wislizenii* | Longnose leopard lizard | | | | | | | | | | | | | |
| *Phrynosoma cornutum* | Texas horned lizard | | | | | | | | | | | | | |
| *Phrynosoma modestum* | Roundtail horned lizard | | | | | | | | | | | | | |
| *Cnemidophorus neotesselatus* | Triploid checkered whiptail | | | | | | | | | | | | | X |
| **Snakes** | | | | | | | | | | | | | | |
| *Leptotyphlops dulcis* | Texas blind snake | | | | | | | | X | | | | | |
| *Hypsiglena torquata* | Night snake | | | | | | | | X | | | | | |
| *Lampropeltis getula* | Common kingsnake | | | | | | | X | X | | | | X | X |
| *Rhinocheilus lecontei* | Long-nosed snake | | | | | | | | | | | | | |
| *Tantilla horbartsmIthi* | Southwestern black-headed snake | | | | | | | | | | | | | |
| *Thamnophis cyrtopsis* | Blacknecked garter snake | | | | | | | X | X | | | X | X | |
| *Thamnophis sirtalis* | Common garter snake | | | | | X | X | X | X | | | | | |
| *Crotalus viridis concolor* | Midget faded rattlesnake | | | | | | | | | | | | | |
| *Sistrurus catenatus* | Massasauga | | | | | | | | | | | | | |

Table C4, Part B - Reptiles - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| **Turtles** | | | | | | | | | | | | | |
| *Kinosternon flavescens* | Yellow mud turtle | | | | | | | | | | | | |
| **Lizards** | | | | | | | | | | | | | |
| *Gambelia wislizenii* | Longnose leopard lizard | | | | | | | | X | X | X | X | |
| *Phrynosoma cornutum* | Texas horned lizard | | X | X | | | | | | | | | |
| *Phrynosoma modestum* | Roundtail horned lizard | | | X | | | | | | | | | |
| *Cnemidophorus neotesselatus* | Triploid checkered whiptail | | | X | | | | | X | | | X | |
| **Snakes** | | | | | | | | | | | | | |
| *Leptotyphlops dulcis* | Texas blind snake | | | X | | | | | | | | | |
| *Hypsiglena torquata* | Night snake | | | X | | | | | X | X | | X | |
| *Lampropeltis getula* | Common kingsnake | | X | X | | | | | | X | | | |
| *Rhinocheilus lecontei* | Long-nosed snake | | | X | | | | | X | | | | |
| *Tantilla horbartsmlthi* | Southwestern black-headed snake | | | | | | | | X | X | X | X | |
| *Thamnophis cyrtopsis* | Blacknecked garter snake | | | | | | | | | | | | |
| *Thamnophis sirtalis* | Common garter snake | | | | | | | | | | | | |
| *Crotalus viridis concolor* | Midget faded rattlesnake | | | | | | | | X | X | X | X | |
| *Sistrurus catenatus* | Massasauga | | X | X | | | | | X | | | | |

Table C4, Part C - Reptiles - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| **Turtles** | | | | | | | | | | | | | | | | |
| *Kinosternon flavescens* | Yellow mud turtle | | | | | | | | | | | | | | | |
| **Lizards** | | | | | | | | | | | | | | | | |
| *Gambelia wislizenii* | Longnose leopard lizard | | | | | | | | X | | | | | | | |
| *Phrynosoma cornutum* | Texas horned lizard | | | | | | | | | | | | | | | |
| *Phrynosoma modestum* | Roundtail horned lizard | | | | | | | | X | | | | | | | |
| *Cnemidophorus neotesselatus* | Triploid checkered whiptail | | | | | | | | | | | | | | X | |
| **Snakes** | | | | | | | | | | | | | | | | |
| *Leptotyphlops dulcis* | Texas blind snake | | | | | | | | | | | | | | | |
| *Hypsiglena torquata* | Night snake | | | | | | | | X | | | | | | | |
| *Lampropeltis getula* | Common kingsnake | | | | | | | | | | | | | | | |
| *Rhinocheilus lecontei* | Long-nosed snake | | | | | | | | | | | | | | | |
| *Tantilla horbartsmlthi* | Southwestern black-headed snake | | | | | | | | X | | | | | | | |
| *Thamnophis cyrtopsis* | Blacknecked garter snake | | | | | | | | | | | | | | | |
| *Thamnophis sirtalis* | Common garter snake | | | | | | | | | | | | | | | |
| *Crotalus viridis concolor* | Midget faded rattlesnake | | | | | | | | | | | | | | | X |
| *Sistrurus catenatus* | Massasauga | | | | | | | | | | | | | | | |

Table C5, Part A - Amphibians - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| **Toads** | | | | | | | | | | | | | | |
| *Scaphiopus couchii* | Couch's Spadefoot | | | | | | X | | | | | | | |
| *Bufo boreas pop. 1* | Boreal Toad (Southern Rocky Mountain Population) | | | | X | X | X | | | | X | | | |
| *Bufo debilis1/* | Green toad | | | | | | | | X | | | | | |
| **Frogs** | | | | | | | | | | | | | | |
| *Acris crepitans* | Northern cricket frog | | | | | | X | X | X | | | | | |
| *Hyla arenicolor1/* | Canyon tree frog | | | | | | | | X | | | X | X | |
| *Gastrophryne olivacea* | Great Plains Narrowmouth Toad | | | | X | | X | | X | | | | | |
| *Rana blairi* | Plains Leopard Frog | | | | X | X | X | X | X | | | | | |
| *Rana pipiens* | Northern Leopard Frog | | | | X | X | X | X | X | X | X | X | X | |
| *Rana sylvatica* | Wood Frog | | | | X | X | X | | | | X | | | |

1/ These species added at the Science Forum using common names. The scientific names were added via an Internet search, therefore, species verification may be necessary; see: http://www.enature.com/fieldguide; accessed 6/14/05/.

Table C5, Part B - Amphibians - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| **Toads** | | | | | | | | | | | | | |
| *Scaphiopus couchii* | Couch's Spadefoot | | | X | | | | | | | | | |
| *Bufo boreas pop. 1* | Boreal Toad (Southern Rocky Mountain Population) | | | | | | | | | | | | |
| *Bufo debilis1/* | Green toad | | | | | | | | | | | | |
| **Frogs** | | | | | | | | | | | | | |
| *Acris crepitans* | Northern cricket frog | | | | | | | | | | | | |
| *Hyla arenicolor1/* | Canyon tree frog | | | | | | | | | | | | |
| *Gastrophryne olivacea* | Great Plains Narrowmouth Toad | | | | | | | | | | | | |
| *Rana blairi* | Plains Leopard Frog | | | | | | | | | | | | |
| *Rana pipiens* | Northern Leopard Frog | | | | | | | | | | | | |
| *Rana sylvatica* | Wood Frog | | | | | | | | | | | | |

1/ These species added at the Science Forum using common names. The scientific names were added via an Internet search, therefore, species verification may be necessary; see: http://www.enature.com/fieldguide; accessed 6/14/05/.

Table C5, Part C - Amphibians - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| **Toads** | | | | | | | | | | | | | | | | |
| *Acris crepitans* | Northern cricket frog | | | | | | | | | | | | | | | |
| *Bufo boreas pop. 1* | Boreal Toad (Southern Rocky Mountain Population) | X | X | | X | | | | | | X | | | | | |
| *Bufo debilis1/* | Green toad | | | | | | | | | | | | | | | |
| *Gastrophryne olivacea* | Great Plains Narrowmouth Toad | | | | | | | | | | | | | | | |
| **Frogs** | | | | | | | | | | | | | | | | |
| *Hyla arenicolor1/* | Canyon tree frog | | | | | | | | | | | | | | | |
| *Rana blairi* | Plains Leopard Frog | | | | | | | | | | | | | | | |
| *Rana pipiens* | Northern Leopard Frog | | | | | | | | | | X | | | | | |
| *Rana sylvatica* | Wood Frog | X | X | | X | | | | | | X | | | | | |
| *Scaphiopus couchii* | Couch's Spadefoot | | | | | | | | | | | | | | | |

1/ These species added at the Science Forum using common names. The scientific names were added via an Internet search, therefore, species verification may be necessary; see: http://www.enature.com/fieldguide; accessed 6/14/05/.

Table C6, Part A - Fish - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| **Sunfishes** | | | | | | | | | | | | | | |
| *Lepomis humilis* | Orangespotted sunfish | | | | X * | | | X | X | X | | | | |
| Catfishes | | | | | | | | | | | | | | |
| *Noturus flavus* | Stonecat | | | | X | | | X | X | X | | | | |
| *Etheostoma cragini* | Arkansas Darter | | | | X | | | X | X | X | | | | |
| *Etheostoma exile* | Iowa darter | | | | X | | | X | X | X | | | | |
| *Etheostoma spectabile* | Plains orangethroat darter | | | | X | | | X | X | X | | | | |
| **Suckers** | | | | | | | | | | | | | | |
| *Catostomus discobolus* | Bluehead sucker | | | | | | | | | | | X | X | |
| *Catostomus latipinnis* | Flannelmouth sucker | | | | X * | | | | | | | X | X | |
| *Catostomus playtrhynchus* | Mountain sucker | | | | X | | | | | | X | | X | |
| *Catostomus plebeius* | Rio Grande Sucker | | | | X | | | | | | X | | | |
| *Xyrauchen texanus* | Razorback Sucker | | | | X | | | | | | | X | | |
| **Minnows** | | | | | | | | | | | | | | |
| *Gila elegans* | Bonytail | | | | | | | | | | | X | | |
| *Ptychocheilus lucius* | Colorado Pikeminnow | | | | X | | | | | | | X | | |
| *Hybognathus hankinsoni* | Brassy minnow | | | | X | | | X | X | X | | | | |
| *Luxilus cornutus* | Common shiner | | | | X | | | | | X | | | | |
| *Platygobio gracilus* | Flathead chub | | | | X | | | X | X | X | | | | |
| *Gila cypha* | Humpback Chub | | | | X | | | | | | | X | | |
| *Couesius plumbeus* | Lake Chub | | | | X * | | | | | | | | | |
| *Hybognathus placitus* | Plains minnow | | | | X | | | X | X | | | | | |
| *Phoxinus eos* | Northern Redbelly Dace | | | | X * | | | | | X | | | | |
| *Gila pandora* | Rio Grande Chub | | | | X * | | | | | X | X | | | |
| *Gila robusta* | Roundtail Chub | | | | X | | | | | | | X | X | |

Table C6, Part A - Fish - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| *Phoxinus erythrogaster* | Southern Redbelly Dace | | | | X * | | | | X | X | | | | |
| *Phenacobius mirabilis* | Suckermouth minnow | | | | X | | | X | X | X | | | | |
| **Trouts** | | | | | | | | | | | | | | |
| *Oncorhynchus clarki pleuriticus* | Colorado River Cutthroat Trout | | | | X * | | | | | | X | | X | |
| *Oncorhynchus clarki stomias* | Greenback Cutthroat Trout | | | | X * | | | | | | X | | | |
| *Oncorhynchus clarki virginalis* | Rio Grande Cutthroat Trout | | | | X * | | | | | | X | | | |
| * Lake habitat | | | | | | | | | | | | | | |

Table C6, Part B - Fish - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| **Sunfishes** | | | | | | | | | | | | | |
| *Lepomis humilis* | Orangespotted sunfish | | | | | | | | | | | | |
| Catfishes | | | | | | | | | | | | | |
| *Noturus flavus* | Stonecat | | | | | | | | | | | | |
| *Etheostoma cragini* | Arkansas Darter | | | | | | | | | | | | |
| *Etheostoma exile* | Iowa darter | | | | | | | | | | | | |
| *Etheostoma spectabile* | Plains orangethroat darter | | | | | | | | | | | | |
| **Suckers** | | | | | | | | | | | | | |
| *Catostomus discobolus* | Bluehead sucker | | | | | | | | | | | | |
| *Catostomus latipinnis* | Flannelmouth sucker | | | | | | | | | | | | |
| *Catostomus playtrhynchus* | Mountain sucker | | | | | | | | | | | | |
| *Catostomus plebeius* | Rio Grande Sucker | | | | | | | | | | | | |
| *Xyrauchen texanus* | Razorback Sucker | | | | | | | | | | | | |
| **Minnows** | | | | | | | | | | | | | |
| *Gila elegans* | Bonytail | | | | | | | | | | | | |
| *Ptychocheilus lucius* | Colorado Pikeminnow | | | | | | | | | | | | |
| *Hybognathus hankinsoni* | Brassy minnow | | | | | | | | | | | | |
| *Luxilus cornutus* | Common shiner | | | | | | | | | | | | |
| *Platygobio gracilus* | Flathead chub | | | | | | | | | | | | |
| *Gila cypha* | Humpback Chub | | | | | | | | | | | | |
| *Couesius plumbeus* | Lake Chub | | | | | | | | | | | | |
| *Hybognathus placitus* | Plains minnow | | | | | | | | | | | | |
| *Phoxinus eos* | Northern Redbelly Dace | | | | | | | | | | | | |
| *Gila pandora* | Rio Grande Chub | | | | | | | | | | | | |
| *Gila robusta* | Roundtail Chub | | | | | | | | | | | | |

Table C6, Part B - Fish - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| *Phoxinus erythrogaster* | Southern Redbelly Dace | | | | | | | | | | | | |
| *Phenacobius mirabilis* | Suckermouth minnow | | | | | | | | | | | | |
| *Oncorhynchus clarki pleuriticus* | Colorado River Cutthroat Trout | | | | | | | | | | | | |
| **Trouts** | | | | | | | | | | | | | |
| *Oncorhynchus clarki stomias* | Greenback Cutthroat Trout | | | | | | | | | | | | |
| *Oncorhynchus clarki virginalis* | Rio Grande Cutthroat Trout | | | | | | | | | | | | |
| * Lake habitat | | | | | | | | | | | | | |

Table C6, Part C - Fish - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| **Sunfishes** | | | | | | | | | | | | | | | | |
| *Lepomis humilis* | Orangespotted sunfish | | | | | | | | | | | | | | | |
| Catfishes | | | | | | | | | | | | | | | | |
| *Noturus flavus* | Stonecat | | | | | | | | | | | | | | | |
| *Etheostoma cragini* | Arkansas Darter | | | | | | | | | | | | | | | |
| *Etheostoma exile* | Iowa darter | | | | | | | | | | | | | | | |
| *Etheostoma spectabile* | Plains orangethroat darter | | | | | | | | | | | | | | | |
| **Suckers** | | | | | | | | | | | | | | | | |
| *Catostomus discobolus* | Bluehead sucker | | | | | | | | | | | | | | | |
| *Catostomus latipinnis* | Flannelmouth sucker | | | | | | | | | | | | | | | |
| *Catostomus playtrhynchus* | Mountain sucker | | | | | | | | | | | | | | | |
| *Catostomus plebeius* | Rio Grande Sucker | | | | | | | | | | | | | | | |
| *Xyrauchen texanus* | Razorback Sucker | | | | | | | | | | | | | | | |
| **Minnows** | | | | | | | | | | | | | | | | |
| *Gila elegans* | Bonytail | | | | | | | | | | | | | | | |
| *Ptychocheilus lucius* | Colorado Pikeminnow | | | | | | | | | | | | | | | |
| *Hybognathus hankinsoni* | Brassy minnow | | | | | | | | | | | | | | | |
| *Luxilus cornutus* | Common shiner | | | | | | | | | | | | | | | |
| *Platygobio gracilus* | Flathead chub | | | | | | | | | | | | | | | |
| *Gila cypha* | Humpback Chub | | | | | | | | | | | | | | | |
| *Couesius plumbeus* | Lake Chub | | | | | | | | | | | | | | | |
| *Hybognathus placitus* | Plains minnow | | | | | | | | | | | | | | | |
| *Phoxinus eos* | Northern Redbelly Dace | | | | | | | | | | | | | | | |
| *Gila pandora* | Rio Grande Chub | | | | | | | | | | | | | | | |
| *Gila robusta* | Roundtail Chub | | | | | | | | | | | | | | | |

Table C6, Part C - Fish - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| *Phoxinus erythrogaster* | Southern Redbelly Dace | | | | | | | | | | | | | | | |
| *Phenacobius mirabilis* | Suckermouth minnow | | | | | | | | | | | | | | | |
| **Trouts** | | | | | | | | | | | | | | | | |
| *Oncorhynchus clarki pleuriticus* | Colorado River Cutthroat Trout | | | | | | | | | | | | | | | |
| *Oncorhynchus clarki stomias* | Greenback Cutthroat Trout | | | | | | | | | | | | | | | |
| *Oncorhynchus clarki virginalis* | Rio Grande Cutthroat Trout | | | | | | | | | | | | | | | |
| * Lake habitat | | | | | | | | | | | | | | | | |

Table C7, Part A - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| **Grebes** | | | | | | | | | | | | | | |
| *Podiceps nigricollis* | Eared Grebe | | | | X | | X | | | | | | | X |
| *Aechmophorus occidentalis* | Western Grebe | | | | | | | | | | | | | |
| **Pelicans** | | | | | | | | | | | | | | |
| *Pelecanus erythrorhynchos* | American White Pelican | | | | X | | | X | | | | X | | X |
| **Herons** | | | | | | | | | | | | | | |
| *Botaurus lentiginosus* | American Bittern | | | | | | X | | | | | | | |
| *Egretta thula* | Snowy Egret | | | | X | X | X | X | X | X | | X | X | X |
| *Plegadis chihi* | White-faced Ibis | | | X | X | X | X | X | | | | X | | X |
| **Swans, geese, and Ducks** | | | | | | | | | | | | | | |
| *Anas acuta* | Northern Pintail | | | | X | | X | X | X | | | X | X | X |
| *Aythya affinis* | Lesser Scaup | | | | X | X | X | X | | | | X | | X |
| *Bucephala islandica* | Barrow's Goldeneye | | | | X | | X | | | | X | X | X | |
| **Kites, Eagles, and Hawks** | | | | | | | | | | | | | | |
| *Pandion haliaetus* | Osprey | | | | X | | | X | | | X | X | | |
| *Haliaeetus leucocephalus* | Bald Eagle | | X | X | X | X | X | X | X | X | X | X | X | X |
| *Circus cyaneus* | Northern Harrier | | X | X | | | X | X | X | X | | X | X | X |
| *Accipiter gentilis* | Northern Goshawk | | | | | | | | | | | | | |
| *Buteo swainsoni* | Swainson's Hawk | X | X | X | | | | X | X | | | X | X | X |
| *Buteo regalis* | Ferruginous Hawk | | X | X | | | | | | | | | | |
| *Aquila chrysaetos* | Golden Eagle | | X | X | X | X | X | X | X | X | X | X | X | X |
| **Falcons** | | | | | | | | | | | | | | |
| *Falco peregrinus anatum* | American Peregrine Falcon | X | | | X | X | X | X | X | X | X | X | X | X |
| *Falco mexicanus* | Prairie Falcon | | X | X | X | X | X | X | X | X | X | X | X | X |
| **Partridges, Grouse, Turkeys, and Quail** | | | | | | | | | | | | | | |
| *Centrocercus urophasianus* | Greater Sage-Grouse | | X | X | | X | X | | | | | | X | |
| *Centrocercus minimus* | Gunnison Sage Grouse | | | X | | X | X | | | | | | X | |

Table C7, Part A - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| *Lagopus leucurus* | White-tailed Ptarmigan | | | | | | | | | | | | | |
| *Tympanuchus cupido* | Greater Prairie Chicken | | X | X | | | | | | | | | | |
| *Dendragapus obscurus* | Blue Grouse | | | | | | | | | | | | | |
| *Tympanuchus phasianellus columbianus* | Columbian Sharp-tailed Grouse | | | X | | | | | | | | | | |
| *Tympanuchus phasianellus jamesii* | Plains Sharp-tailed Grouse | | | | | | | | | | | | | |
| *Tympanuchus pallidicinctus* | Lesser Prairie-chicken | | X | X | | | | | | | | | | |
| *Callipepla squamata* | Scaled Quail | X | X | X | | | | | | | | | | X |
| **Rails, Gallinules, and Coots** | | | | | | | | | | | | | | |
| *Laterallus jamaicensis* | Black Rail | | | | | | X | X | | | | | | |
| **Cranes** | | | | | | | | | | | | | | |
| *Grus canadensis tabida* | Greater Sandhill Crane | | X | X | X | X | X | | | | X | X | | |
| *Grus americana* | Whooping Crane | | X | X | | | X | | | | | | | |
| **Plovers** | | | | | | | | | | | | | | |
| *Charadrius alexandrinus nivosus* | Western Snowy Plover | | | | | | | | | | | | | X |
| *Charadrius melodus* | Piping Plover | | | | X | | X | X | | | | | | X |
| *Charadrius montanus* | Mountain Plover | | X | X | | | | | | | | | | |
| **Sandpipers and Phalaropes** | | | | | | | | | | | | | | |
| *Bartramia longicauda* | Upland Sandpiper | | X | X | | | | | | | | | | |
| *Numenius americanus* | Long-billed Curlew | | X | X | X | | X | X | X | | | | | X |
| *Limosa fedoa* | Marbled Godwit | | | | X | | | X | | | | | | X |
| *Phalaropus tricolor* | Wilson's Phalarope | | | | X | X | X | | | | | | | X |
| **Jaegers, Gulls, and Terns** | | | | | | | | | | | | | | |
| *Sterna forsteri* | Forster's Tern | | | | X | X | X | X | | | | | | X |
| *Sterna antillarum* | Least Tern | | | | X | | | X | | | | | | X |
| **Pigeons and Doves** | | | | | | | | | | | | | | |
| *Patagioenas fasciata* | Band-tailed Pigeon | X | | X | | | | | | | | | | |
| **Cuckoos, Roadrunners, and Anis** | | | | | | | | | | | | | | |
| *Coccyzus americanus* | Western Yellow-billed Cuckoo | | | | | | | | | | | | | |

Table C7, Part A - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | | | | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | | **Dryland Crops** | | **Irrigated Crops** | | | | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| **Owls** | | | | | | | | | | | | | | | | | | | |
| *Athene cunicularia hypugaea* | Western Burrowing Owl | X | X | X | | | | | | | | | | | X | | | | |
| *Otus flammeolus* | Flammulated Owl | | | | | | | | | | | | | | | | | | |
| *Strix occidentalis lucida* | Mexican Spotted Owl | | | | | | | | | X | X | | | | | | | | |
| *Asio flammeus* | Short-eared Owl | | | | | | X | | | | | | | | | | | | |
| *Aegolius funereus* | Boreal Owl | | | | | | | | | | | | | | | | | | |
| **Swifts** | | | | | | | | | | | | | | | | | | | |
| *Cypseloides niger* | Black Swift | | | | | | | | | | X | X | X | | | | | | |
| *Aeronautes saxatalis* | White-throated Swift | | | | | | | | | | | | | | | | | | |
| **Hummingbirds** | | | | | | | | | | | | | | | | | | | |
| *Archilochus alexandri* | Black-chinned Hummingbird | X | | | | X | X | | | | | X | X | | | | | | |
| *Selasphorus platycercus* | Broad-tailed Hummingbird | X | | | | | | | | | X | | | | | | | | |
| *Selasphorus rufus* | Rufous Hummingbird | X | | | | | | | | | | | | | | | | | |
| **Woodpeckers** | | | | | | | | | | | | | | | | | | | |
| *Melanerpes lewis* | Lewis's Woodpecker | X | | X | | | | X | X | X | | X | X | | | | | | |
| *Sphyrapicus thyroideus* | Williamson's Sapsucker | | | | | | | | | | | | | | | | | | |
| *Sphyrapicus nuchalis* | Red-naped Sapsucker | | | | | X | | | | X | X | | X | | | | | | |
| *Picoides dorsalis* | American Three-toed Woodpecker | | | | | | | | | | | | | | | | | | |
| **Flycatchers** | | | | | | | | | | | | | | | | | | | |
| *Contopus cooperi* | Olive-sided Flycatcher | | | | | | | | | | | | | | | | | | |
| *Empidonax traillii extimus* | Southwestern Willow Flycatcher | | | | | X | | | | | | X | X | | | | | | |
| *Empidonax wrightii* | Gray Flycatcher | | | | | | | | | | | | | | | | | | |
| *Empidonax oberholseri* | Dusky Flycatcher | | | | | X | | | | | | | | | | | | | |
| *Empidonax* | Cordilleran | | | | | | | | | X | X | X | X | | | | | | |

Table C7, Part A - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | | | Urban and Croplands | | | | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | | **Urban** | | **Dryland Crops** | | **Irrigated Crops** | | | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| *occidentalis* | Flycatcher | | | | | | | | | | | | | | | | | | |
| **Shrikes** | | | | | | | | | | | | | | | | | | | |
| *Lanius ludovicianus* | Loggerhead Shrike | | X | X | | | | | | | | | | | | | | | |
| **Vireos** | | | | | | | | | | | | | | | | | | | |
| *Vireo vicinior* | Gray Vireo | | | | | | | | | | | | | | | | | | |
| **Jays, Magpies, and Crows** | | | | | | | | | | | | | | | | | | | |
| *Gymnorhinus cyanocephalus* | Pinyon Jay | X | | | | | | | | | | | | | | | | | |
| **Swallows** | | | | | | | | | | | | | | | | | | | |
| *Progne subis hesperia* | Western Purple Martin | | | | | | | | | X | X | | | | | | | | |
| **Chickadees and Titmice** | | | | | | | | | | | | | | | | | | | |
| *Baeolophus ridgwayi* | Juniper Titmouse | | | | | | | | | | | | | | | | | | |
| **Nuthatches** | | | | | | | | | | | | | | | | | | | |
| *Sitta pygmaea* | Pygmy Nuthatch | X | | | | | | | | | | | | | | | | | |
| **Dippers** | | | | | | | | | | | | | | | | | | | |
| *Cinclus mexicanus* | American Dipper | | | | | | | | | X | X | X | X | | | | | | |
| **Kinglets, Gnatcatchers, and Thrushes** | | | | | | | | | | | | | | | | | | | |
| *Catharus fuscecens* | Veery | | | | | X | | | | | X | | | | | | | | |
| *Toxostoma curvirostre* | Curve-billed Thrasher | | X | X | | | | | | | | | | | | | | | |
| **Wood-Warblers** | | | | | | | | | | | | | | | | | | | |
| *Vermivora virginiae* | Virginia's Warbler | | | | | | | | | X | | | | | | | | | |
| *Dendroica nigrescens* | Black-throated Gray Warbler | | | | | | | | | | | | | | | | | | |
| *Dendroica graciae* | Grace's Warbler | | | | | | | | | | | | | | | | | | |
| **New World Sparrows** | | | | | | | | | | | | | | | | | | | |
| *Aimophila cassinii* | Cassin's Sparrow | | X | X | | | | | | | | | | | | | | | |
| *Spizella breweri* | Brewer's Sparrow | | X | X | | | | | | | | | | | | | | | |
| *Amphispiza belli* | Sage Sparrow | | | | | | | | | | | | | | | | | | |
| *Calamospiza* | Lark Bunting | | X | X | | | | | | | | | | | X | | | | |

Table C7, Part A - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| *melanocorys* | | | | | | | | | | | | | | |
| *Pooecetes gramineus* | Vesper Sparrow | | | | | | | | | | | | | |
| *Zonotrichia querula* | Harris' Sparrow | X | X | X | | | | | | | | | | |
| *Calcarius mccownii* | McCown's Longspur | X | | | | | | | | X | | | | |
| *Calcarius ornatus* | Chestnut-collared Longspur | X | | | | | | | | | | | | |
| **Grosbeaks and Buntings** | | | | | | | | | | | | | | |
| *Passerina amoena* | Lazuli Bunting | | X | X | X | X | X | | | | | | | |
| **Blackbirds and Orioles** | | | | | | | | | | | | | | |
| *Dolichonyx oryzivorus* | Bobolink | X | | | | | | | | | | | | |
| **Finches** | | | | | | | | | | | | | | |
| *Leucosticte atrata* | Black Rosy-Finch | | | | | | | | | | | | | |
| *Leucosticte australis* | Brown-capped Rosy-Finch | | | | | | | | | | | | | |
| *Coccothraustes vespertinus* | Evening Grosbeak | | | | | | | | | | | | | |
| *Carpodacus cassinii* | Cassin's Finch | | | | | | | | | | | | | |
| *Loxia curvirostra* | Red Crossbill | | | | | | | | | | | | | |

Table C7, Part B - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| **Grebes** | | | | | | | | | | | | | |
| *Podiceps nigricollis* | Eared Grebe | | | | | | | | | | | | |
| *Aechmophorus occidentalis* | Western Grebe | | | | | | | | | | | | |
| **Pelicans** | | | | | | | | | | | | | |
| *Pelecanus erythrorhynchos* | American White Pelican | | | | | | | | | | | | |
| **Herons** | | | | | | | | | | | | | |
| *Botaurus lentiginosus* | American Bittern | | | | | | | | | | | | |
| *Egretta thula* | Snowy Egret | | | | | | | | | | | | |
| *Plegadis chihi* | White-faced Ibis | | | | | | | | | | | | |
| **Swans, Geese, and Ducks** | | | | | | | | | | | | | |
| *Anas acuta* | Northern Pintail | | | | | | | | | | | | |
| *Aythya affinis* | Lesser Scaup | | | | | | | | | | | | |
| *Bucephala islandica* | Barrow's Goldeneye | | | | | | | | | | | | |
| **Kites, Eagles, and Hawks** | | | | | | | | | | | | | |
| *Pandion haliaetus* | Osprey | | | | | | | | | | | | |
| *Haliaeetus leucocephalus* | Bald Eagle | X | X | X | X | | | | | | | | |
| *Circus cyaneus* | Northern Harrier | X | X | X | X | X | | | X | X | X | X | X |
| *Accipiter gentilis* | Northern Goshawk | | | | | | | | | | | | |
| *Buteo swainsoni* | Swainson’s Hawk | X | X | X | X | X | X | X | X | X | X | | X |
| *Buteo regalis* | Ferruginous Hawk | X | X | X | X | X | X | | X | X | X | X | X |
| *Aquila chrysaetos* | Golden Eagle | X | X | X | X | X | X | X | X | X | X | X | X |
| **Falcons** | | | | | | | | | | | | | |
| *Falco peregrinus anatum* | American Peregrine Falcon | | | | | | | | | | | | |
| *Falco mexicanus* | Prairie Falcon | X | X | X | X | X | | | X | X | X | X | X |
| **Partridges, Grouse, and Quail** | | | | | | | | | | | | | |
| *Centrocercus urophasianus* | Greater Sage-Grouse | | | | | | | | X | | | | |
| *Centrocercus minimus* | Gunnison Sage Grouse | | | | | | | | X | | | | |
| *Lagopus leucurus* | White-tailed Ptarmigan | | | | | | | | | | | | |

Table C7, Part B - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| *Tympanuchus cupido* | Greater Prairie Chicken | X | X | X | | X | | | | | | | |
| *Dendragapus obscurus* | Blue Grouse | | | | X | | X | X | | | | | |
| *Tympanuchus phasianellus columbianus* | Columbian Sharp-tailed Grouse | | | | X | | X | X | X | | | | |
| *Tympanuchus phasianellus jamesii* | Plains Sharp-tailed Grouse | X | X | X | X | X | | X | | | | | |
| *Tympanuchus pallidicinctus* | Lesser Prairie-chicken | X | X | X | | X | | | | | | | |
| *Callipepla squamata* | Scaled Quail | | X | X | | X | | | X | X | | X | X |
| **Rails, Gallinules, and Coots** | | | | | | | | | | | | | |
| *Laterallus jamaicensis* | Black Rail | | | | | | | | | | | | |
| **Cranes** | | | | | | | | | | | | | |
| *Grus canadensis tabida* | Greater Sandhill Crane | | | | X | | | | | | | | |
| *Grus americana* | Whooping Crane | | | | | | | | | | | | |
| **Plovers** | | | | | | | | | | | | | |
| *Charadrius alexandrinus nivosus* | Western Snowy Plover | | | | | | | | | | | | |
| *Charadrius melodus* | Piping Plover | | | | | | | | | | | | |
| *Charadrius montanus* | Mountain Plover | | X | X | X | | | | | X | X | | |
| **Sandpipers and Phalaropes** | | | | | | | | | | | | | |
| *Bartramia longicauda* | Upland Sandpiper | X | X | | | X | | | | | | | |
| *Numenius americanus* | Long-billed Curlew | | X | X | | X | | | | | | | |
| *Limosa fedoa* | Marbled Godwit | | | | | | | | | | | | |
| *Phalaropus tricolor* | Wilson’s Phalarope | | | | | | | | | | | | |
| **Jaegers, Gulls, and Terns** | | | | | | | | | | | | | |
| *Sterna forsteri* | Forster's Tern | | | | | | | | | | | | |
| *Sterna antillarum* | Least Tern | | | | | | | | | | | | |
| **Pigeons and Doves** | | | | | | | | | | | | | |
| *Patagioenas fasciata* | Band-tailed Pigeon | | | | | | X | X | | | | | |
| **Cuckoos, Roadrunners, and Anis** | | | | | | | | | | | | | |
| *Coccyzus americanus* | Western Yellow-billed Cuckoo | | | | | | | | | | | | |
| **Owls** | | | | | | | | | | | | | |

Table C7, Part B - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| *Athene cunicularia hypugaea* | Western Burrowing Owl | X | X | X | | | | | X | X | X | | |
| *Otus flammeolus* | Flammulated Owl | | | | | | | | | | | | |
| *Strix occidentalis lucida* | Mexican Spotted Owl | | | | | | | | | | | | |
| *Asio flammeus* | Short-eared Owl | | X | X | X | X | X | | X | | | | |
| *Aegolius funereus* | Boreal Owl | | | | | | | | | | | | |
| **Swifts** | | | | | | | | | | | | | |
| *Cypseloides niger* | Black Swift | | | | | | | | | | | | |
| *Aeronautes saxatalis* | White-throated Swift | | | | | | | | | | | | |
| **Hummingbird** | | | | | | | | | | | | | |
| *Archilochus alexandri* | Black-chinned Hummingbird | | | | | | | | | | | | |
| *Selasphorus platycercus* | Broad-tailed Hummingbird | | | | X | | X | X | X | | | | |
| *Selasphorus rufus* | Rufous Hummingbird | | | | X | | X | X | | | | | |
| **Woodpeckers** | | | | | | | | | | | | | |
| *Melanerpes lewis* | Lewis's Woodpecker | | | | | | | | | | | | |
| *Sphyrapicus thyroideus* | Williamson's Sapsucker | | | | | | | | | | | | |
| *Sphyrapicus nuchalis* | Red-naped Sapsucker | | | | | | | | | | | | |
| *Picoides dorsalis* | American Three-toed Woodpecker | | | | | | | | | | | | |
| **Flycatchers** | | | | | | | | | | | | | |
| *Contopus cooperi* | Olive-sided Flycatcher | | | | | | | | | | | | |
| *Empidonax trailli extimus* | Southwestern Willow Flycatcher | | | | | | | | | | | | |
| *Empidonax wrightii* | Gray Flycatcher | | | | | | | | X | | | | |
| *Empidonax oberholseri* | Dusky Flycatcher | | | | | | X | X | | | | | |
| *Empidonax occidentalis* | Cordilleran Flycatcher | | | | | | | | | | | | |
| **Shrikes** | | | | | | | | | | | | | |
| *Lanius ludovicianus* | Loggerhead Shrike | X | X | X | X | X | | | X | X | X | X | |
| **Vireos** | | | | | | | | | | | | | |
| *Vireo vicinior* | Gray Vireo | | | | | | | | | | | | |
| **Jays, Magpies, and Crows** | | | | | | | | | | | | | |

Table C7, Part B - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| *Gymnorhinus cyanocephalus* | Pinyon Jay | | | | | | | | | | | | |
| **Swallows** | | | | | | | | | | | | | |
| *Progne subis hesperia* | Western Purple Martin | | | | | | | | | | | | |
| ***Chickadees and Titmice*** | | | | | | | | | | | | | |
| *Baeolophus ridgwayi* | *Juniper Titmouse* | | | | | | | | | | | | |
| **Nuthatches** | | | | | | | | | | | | | |
| *Sitta pygmaea* | Pygmy Nuthatch | | | | | | | | | | | | |
| **Dippers** | | | | | | | | | | | | | |
| *Cinclus mexicanus* | American Dipper | | | | | | | | | | | | |
| **Kinglets, Gnatcatchers, and Thrushes** | | | | | | | | | | | | | |
| *Catharus fuscecens* | Veery | | | | | | | | | | | | |
| *Toxostoma curvirostre* | Curve-billed Thrasher | | | X | | | | | | X | | | X |
| **Wood-Warblers** | | | | | | | | | | | | | |
| *Vermivora virginiae* | Virginia's Warbler | | | | | | X | X | | | | | |
| *Dendroica nigrescens* | Black-throated Gray Warbler | | | | | | | | | | | | |
| *Dendroica graciae* | Grace's Warbler | | | | | | | | | | | | |
| **New World Sparrows** | | | | | | | | | | | | | |
| *Aimophila cassinii* | Cassin's Sparrow | | X | X | | X | | | | | | | X |
| *Spizella breweri* | Brewer's Sparrow | | | | | X | | | X | X | X | X | |
| *Amphispiza belli* | Sage Sparrow | | | | | | | | X | | | X | |
| *Calamospiza melanocorys* | Lark Bunting | X | X | X | X | | | | X | X | | | |
| *Pooecetes gramineus* | Vesper Sparrow | X | X | | X | X | | | X | X | | X | |
| *Zonotrichia querula* | Harris' Sparrow | | | | | | | | | | | | |
| *Calcarius mccownii* | McCown's Longspur | X | X | X | | | | | | | | | |
| *Calcarius ornatus* | Chestnut-collared Longspur | X | X | X | | | | | | | | | |
| **Grosbeaks and Buntings** | | | | | | | | | | | | | |
| *Passerina amoena* | Lazuli Bunting | | | | | | X | X | | | | | |
| **Blackbirds and Orioles** | | | | | | | | | | | | | |
| *Dolichonyx oryzivorus* | Bobolink | X | X | | X | | | | | | | | |

Table C7, Part B - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| **Finches** | | | | | | | | | | | | | |
| *Leucosticte atrata* | Black Rosy-Finch | | | | | | | | X | | | | |
| *Leucosticte australis* | Brown-capped Rosy-Finch | | | | | | | | X | | | | |
| *Coccothraustes vespertinus* | Evening Grosbeak | | | | | | | | | | | | |
| *Carpodacus cassinii* | Cassin's Finch | | | | | | | | | | | | |
| *Loxia curvirostra* | Red Crossbill | | | | | | | | | | | | |

Table C7, Part C - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| **Grebes** | | | | | | | | | | | | | | | | |
| *Podiceps nigricollis* | Eared Grebe | | | | | | | | | | | | | | | |
| *Aechmophorus occidentalis* | Western Grebe | | | | | | | | | | | | | | | |
| **Pelicans** | | | | | | | | | | | | | | | | |
| *Pelecanus erythrorhynchos* | American White Pelican | | | | | | | | | | | | | | X | |
| **Herons** | | | | | | | | | | | | | | | | |
| *Botaurus lentiginosus* | American Bittern | | | | | | | | | | | | | | | |
| *Egretta thula* | Snowy Egret | | | | | | | | | | | | | | | |
| *Plegadis chihi* | White-faced Ibis | | | | | | | | | | | | | | | |
| **Swans, Geese, and Ducks** | | | | | | | | | | | | | | | | |
| *Anas acuta* | Northern Pintail | | | | | | | | | | | | | | | |
| *Aythya affinis* | Lesser Scaup | | | | | | | | | | | | | | | |
| *Bucephala islandica* | Barrow's Goldeneye | | | | | | | | | | | | | | | |
| **Kites, Eagles, and Hawks** | | | | | | | | | | | | | | | | |
| *Pandion haliaetus* | Osprey | | | | | | | | | | | | | | | |
| *Haliaeetus leucocephalus* | Bald Eagle | | | | | | | | | | | | | | | |
| *Circus cyaneus* | Northern Harrier | | | | | | | | | | | | | | | |
| *Accipiter gentilis* | Northern Goshawk | X | | X | X | | X | | X | | X | X | | | | |
| *Buteo swainsoni* | Swainson's Hawk | | | | | | | | | | | | | | | |
| *Buteo regalis* | Ferruginous Hawk | | | | | | | | X | | | | | | | X |
| *Aquila chrysaetos* | Golden Eagle | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| **Falcons** | | | | | | | | | | | | | | | | |
| *Falco peregrinus anatum* | American Peregrine Falcon | | | | | | X | | X | | | | | | | X |
| *Falco mexicanus* | Prairie Falcon | | | | | | | | X | | | | X | X | X | X |
| **Partridges, Grouse, Turkeys, and Quail** | | | | | | | | | | | | | | | | |
| *Centrocercus urophasianus* | Greater Sage-Grouse | | | | | | | | | | | | | | | |
| *Centrocercus minimus* | Gunnison Sage Grouse | | | | | | | | | | | | | | | |
| *Lagopus leucurus* | White-tailed | | | | | | | | | | | | X | X | | |

Table C7, Part C - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| | Ptarmigan | | | | | | | | | | | | | | | |
| *Tympanuchus cupido* | Greater Prairie Chicken | | | | | | | | | | | | | | | |
| *Dendragapus obscurus* | Blue Grouse | X | X | X | X | X | X | X | | X | X | X | | | | |
| *Tympanuchus phasianellus columbianus* | Columbian Sharp-tailed Grouse | | | | | | | | | | | | | | | |
| *Tympanuchus phasianellus jamesii* | Plains Sharp-tailed Grouse | | | | | | | | | | | | | | | |
| *Tympanuchus pallidicinctus* | Lesser Prairie-chicken | | | | | | | | | | | | | | | |
| *Callipepla squamata* | Scaled Quail | | | | | | | | X | | | | | | | |
| **Rails, Gallinules, and Coots** | | | | | | | | | | | | | | | | |
| *Laterallus jamaicensis* | Black Rail | | | | | | | | | | | | | | | |
| **Cranes** | | | | | | | | | | | | | | | | |
| *Grus canadensis tabida* | Greater Sandhill Crane | | | | | | | | | | | | | | | |
| *Grus americana* | Whooping Crane | | | | | | | | | | | | | | | |
| **Plovers** | | | | | | | | | | | | | | | | |
| *Charadrius alexandrinus nivosus* | Western Snowy Plover | | | | | | | | | | | | | | X | |
| *Charadrius melodus* | Piping Plover | | | | | | | | | | | | | | X | |
| *Charadrius montanus* | Mountain Plover | | | | | | | | | | | | | | | |
| **Sandpipers and Phalaropes** | | | | | | | | | | | | | | | | |
| *Bartramia longicauda* | Upland Sandpiper | | | | | | | | | | | | | | | |
| *Numenius americanus* | Long-billed Curlew | | | | | | | | | | | | | | | |
| *Limosa fedoa* | Marbled Godwit | | | | | | | | | | | | | | | |
| *Phalaropus tricolor* | Wilson's Phalarope | | | | | | | | | | | | | | | |
| **Jaegers, Gulls, and Terns** | | | | | | | | | | | | | | | | |
| *Sterna forsteri* | Forster's Tern | | | | | | | | | | | | | | | |
| *Sterna antillarum* | Least Tern | | | | | | | | | | | | | | X | |
| **Pigeons and Doves** | | | | | | | | | | | | | | | | |
| *Patagioenas fasciata* | Band-tailed Pigeon | X | X | X | X | X | X | X | X | | X | X | | | | |
| **Cuckoos, Roadrunners, and Anis** | | | | | | | | | | | | | | | | |

Table C7, Part C - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| *Coccyzus americanus* | Western Yellow-billed Cuckoo | | | | | | | | | | | | | | | |
| **Owls** | | | | | | | | | | | | | | | | |
| *Athene cunicularia hypugaea* | Western Burrowing Owl | | | | | | | | | | | | | | | |
| *Otus flammeolus* | Flammulated Owl | X | X | X | | X | X | X | | | X | X | | | | |
| *Strix occidentalis lucida* | Mexican Spotted Owl | | | X | | | X | | X | | X | | | | | X |
| *Asio flammeus* | Short-eared Owl | | | | | | | | | | | | | | | |
| *Aegolius funereus* | Boreal Owl | | X | | X | | | | | X | | | | | | |
| *Cypseloides niger* | Black Swift | | | | | | | | | | | | | | | X |
| *Aeronautes saxatalis* | White-throated Swift | | | | | | | | | | | | | | | X |
| **Hummingbirds** | | | | | | | | | | | | | | | | |
| *Archilochus alexandri* | Black-chinned Hummingbird | | | | | | | | X | | | | | | | |
| *Selasphorus platycercus* | Broad-tailed Hummingbird | X | X | X | X | X | X | X | X | X | X | X | | | | |
| *Selasphorus rufus* | Rufous Hummingbird | | | | | | | | | | | | X | X | | |
| **Woodpeckers** | | | | | | | | | | | | | | | | |
| *Melanerpes lewis* | Lewis's Woodpecker | | | | | | X | | X | | | | | | | |
| *Sphyrapicus thyroideus* | Williamson's Sapsucker | X | X | X | X | X | X | X | | | X | X | | | | |
| *Sphyrapicus nuchalis* | Red-naped Sapsucker | X | X | X | X | X | X | X | | X | X | X | | | | |
| *Picoides dorsalis* | American Three-toed Woodpecker | X | X | X | X | X | X | X | | X | X | | | | | |
| **Flycatchers** | | | | | | | | | | | | | | | | |
| *Contopus cooperi* | Olive-sided Flycatcher | X | X | X | X | X | X | X | X | X | X | X | | | | |
| *Empidonax trailli extimus* | Southwestern Willow Flycatcher | | | | | | | | | | | | | | | |
| *Empidonax wrightii* | Gray Flycatcher | | | | | | | | X | | | | | | | |
| *Empidonax oberholseri* | Dusky Flycatcher | X | X | X | X | X | X | X | X | X | X | X | X | | | |
| *Empidonax occidentalis* | Cordilleran Flycatcher | X | X | X | X | X | X | X | | X | X | X | | | | X |
| **Shrikes** | | | | | | | | | | | | | | | | |
| *Lanius ludovicianus* | Loggerhead Shrike | | | | | | | | | | | | | | | |
| **Vireos** | | | | | | | | | | | | | | | | |

Table C7, Part C - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| *Vireo vicinior* | Gray Vireo | | | | | | | | X | | | | | | | |
| **Jays, Magpies, and Crows** | | | | | | | | | | | | | | | | |
| *Gymnorhinus cyanocephalus* | Pinyon Jay | | | | | X | X | | X | | | | | | | |
| **Swallows** | | | | | | | | | | | | | | | | |
| *Progne subis hesperia* | Western Purple Martin | X | | | | | | | | | | | | | | |
| **Chickadees and Titmice** | | | | | | | | | | | | | | | | |
| *Baeolophus ridgwayi* | Juniper Titmouse | | | | | | | | X | | | | | | | |
| **Nuthatches** | | | | | | | | | | | | | | | | |
| *Sitta pygmaea* | Pygmy Nuthatch | | | | | | X | | | | | | | | | |
| **Dippers** | | | | | | | | | | | | | | | | |
| *Cinclus mexicanus* | American Dipper | | | | | | | | | | | | | | | |
| **Kinglets, Gnatcatchers, and Thrushes** | | | | | | | | | | | | | | | | |
| *Catharus fuscecens* | Veery | | | | | | | | | | | | | | | |
| *Toxostoma curvirostre* | Curve-billed Thrasher | | | | | | | | | | | | | | | |
| **Wood-Warblers** | | | | | | | | | | | | | | | | |
| *Vermivora virginiae* | Virginia's Warbler | X | | | | X | X | | X | | | X | | | | |
| *Dendroica nigrescens* | Black-throated Gray Warbler | | | | | | | | X | | | | | | | |
| *Dendroica graciae* | Grace's Warbler | | | | | | X | | | | | | | | | |
| **New World Sparrows** | | | | | | | | | | | | | | | | |
| *Aimophila cassinii* | Cassin's Sparrow | | | | | | | | | | | | | | | |
| *Spizella breweri* | Brewer's Sparrow | | | | | | | | | | | | | | | |
| *Amphispiza belli* | Sage Sparrow | | | | | | | | | | | | | | | |
| *Calamospiza melanocorys* | Lark Bunting | | | | | | | | | | | | | | | |
| *Pooecetes gramineus* | Vesper Sparrow | | | | | | | | | | | | | | | |
| *Zonotrichia querula* | Harris' Sparrow | | | | | | | | | | | | | | | |
| *Calcarius mccownii* | McCown's Longspur | | | | | | | | | | | | | | | |
| *Calcarius ornatus* | Chestnut-collared Longspur | | | | | | | | | | | | | | | |
| **Grosbeaks and Buntings** | | | | | | | | | | | | | | | | |

Table C7, Part C - Birds - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| *Passerina amoena* | Lazuli Bunting | X | | | | | | | | | | | | | | |
| **Blackbirds and Orioles** | | | | | | | | | | | | | | | | |
| *Dolichonyx oryzivorus* | Bobolink | | | | | | | | | | | | | | | |
| **Finches** | | | | | | | | | | | | | | | | |
| *Leucosticte atrata* | Black Rosy-Finch | | | | | | | | | | | | X | X | | X |
| *Leucosticte australis* | Brown-capped Rosy-Finch | | | | | | | | | | | | X | X | | X |
| *Coccothraustes vespertinus* | Evening Grosbeak | X | X | X | X | X | X | X | | X | X | X | | | | |
| *Carpodacus cassinii* | Cassin's Finch | X | X | X | X | X | X | X | X | X | X | X | | | | |
| *Loxia curvirostra* | Red Crossbill | | X | X | X | X | X | X | | | X | | | | | |

Table C8, Part A - Mammals - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| **Shrews** | | | | | | | | | | | | | | |
| *Sorex nanus* | Dwarf Shrew | | | | | | | | | | X | | | |
| *Sorex preblei* | Preble's Shrew | | | | | | | | | | | | | |
| **Bats** | | | | | | | | | | | | | | |
| *Euderma maculatum* | Spotted Bat | | | | | | | | | | | X | X | |
| *Idionycteris phyllotis* | Allen's big-eared bat | | | | | | | | | | | X | X | |
| *Myotis occultus* | Arizona myotis | X | | | | | | X | X | X | X | X | X | |
| *Myotis thysanodes* | Fringed myotis | | | | | | | | | X | X | X | X | |
| *Plecotus (Choynorhinus) townsendii pallescens* | Townsend's Big-eared Bat Subsp | | | | | | | | | X | X | X | X | |
| **Rabbits and Hares** | | | | | | | | | | | | | | |
| *Lepus townsendii* | White-tailed Jackrabbit | | | | | | | | | | | | | |
| **Squirrels** | | | | | | | | | | | | | | |
| *Cynomys gunnisoni* | Gunnison prairie dog | | | | | | | | | | | | | |
| *Cynomys leucurus* | White-tailed prairie dog | | | | | | | | | | | | | |
| *Cynomys ludovicianus* | Black-tailed prairie dog | X | | | | | | | | | | | | |
| **Pocket Gophers** | | | | | | | | | | | | | | |
| *Thomomys bottae rubidus* | Botta's Pocket Gopher (rubidus ssp) | | | | | | | | | | | | | |
| *Thomomys talpoides macrotis* | Northern pocket gopher (macrotis ssp) | | | | | | | | | | | | | |
| *Perognathus fasciatus* | Olive-backed pocket mouse | | | | | | | | | | | | | |
| **Jumping Mice** | | | | | | | | | | | | | | |
| *Zapus hudsonius preblei* | Meadow Jumping Mouse (both subspecies) | | | | | X | | X | X | X | X | | | |
| **Dogs and Allies** | | | | | | | | | | | | | | |
| *Canis lupus* | Gray Wolf - two subspecies (Northern and Mexican) | | | | | | | | | | | | | |
| *Vulpes macrotis* | Kit Fox | | | | | | | | | | | | | |

Table C8, Part A - Mammals - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Urban and Croplands | | | Riparian/Wetlands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Urban** | **Dryland Crops** | **Irrigated Crops** | **Open Water** | **Shrub-dominated Wetlands** | **Grass/Forb Dominated Wetlands** | **Eastern Plains Rivers** | **Eastern Plains Streams** | **Transition Streams** | **Mountain Streams** | **West Slope Rivers** | **West Slope Streams** | **Playas** |
| *Vulpes velox* | Swift Fox | | X | | | | | | | | | | | |
| **Bears** | | | | | | | | | | | | | | |
| *Ursus arctos* | Grizzly bear | | | | | | | | | | X | | | |
| **Weasels and Allies** | | | | | | | | | | | | | | |
| *Conepatus leuconotus* | Common Hog-nosed Skunk | | | | | | | | | | | | | |
| *Gulo gulo* | Wolverine | | | | | | | | | | | | | |
| *Lontra canadensis* | River Otter | | | | X | X | X | X | X | X | X | X | X | |
| *Mustela nigripes* | Black-footed Ferret | | | | | | | | | | | | | |
| **Cattle and Allies** | | | | | | | | | | | | | | |
| *Bison bison* | Bison | | | | | | | | | | | | | |
| **Cats** | | | | | | | | | | | | | | |
| *Lynx canadensis* | Lynx | | | | | | | | | | | | | |

Table C8, Part B - Mammals - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Deciduous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| **Shrews** | | | | | | | | | | | | | |
| *Sorex nanus* | Dwarf Shrew | | | | | | | | | | | | |
| *Sorex preblei* | Preble's Shrew | | | | X | | | X | X | | | | |
| **Bats** | | | | | | | | | | | | | |
| *Euderma maculatum* | Spotted Bat | | | | | | X | | | X | | | |
| *Idionycteris phyllotis* | Allen's big-eared bat | | | | | | | X | X | | | | |
| *Myotis occultus* | Arizona myotis | | | | X | | X | X | X | X | | | |
| *Myotis thysanodes* | Fringed myotis | | | | X | | X | X | X | X | | | |
| *Plecotus (Choynorhinus) townsendii pallescens* | Townsend's Big-eared Bat Subsp | | | | X | | X | X | X | X | | | |
| **Rabbits and Hares** | | | | | | | | | | | | | |
| *Lepus townsendii* | White-tailed Jackrabbit | X | X | X | X | X | X | X | X | X | X | X | X |
| **Squirrels** | | | | | | | | | | | | | |
| *Cynomys gunnisoni* | Gunnison prairie dog | | | | X | | | X | X | X | | X | |
| *Cynomys leucurus* | White-tailed prairie dog | | | | | | | | X | X | | | |
| *Cynomys ludovicianus* | Black-tailed prairie dog | | X | X | | | | | | | | | X |
| **Pocket Gophers** | | | | | | | | | | | | | |
| *Thomomys bottae rubidus* | Botta's Pocket Gopher (rubidus ssp) | | | | X | | | | | | | | |
| *Thomomys talpoides macrotis* | Northern pocket gopher (macrotis ssp) | | X | X | X | | | | | | | | |
| *Perognathus fasciatus* | Olive-backed pocket mouse | | X | X | X | | | | | | | | |
| **Jumping Mice** | | | | | | | | | | | | | |
| *Zapus hudsonius preblei* | Meadow Jumping Mouse (both subspecies) | | | | | | | | | | | | |
| **Dogs and Allies** | | | | | | | | | | | | | |
| *Canis lupus* | Gray Wolf - two subspecies (Northern and Mexican) | | | | X | | X | X | X | | | | |
| *Vulpes macrotis* | Kit Fox | | | | | | | | X | X | X | X | |

Table C8, Part B - Mammals - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Grasslands | | | | | Shrublands | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Tallgrass Prairie** | **Midgrass Prairie** | **Shortgrass Prairie** | **Foothill / Mountain Grassland** | **Sand Dune Complex (Grassland)** | **Upland Shrub** | **Decidu-ous Oak** | **Sage-brush** | **Desert Shrub** | **Saltbrush Fans &and Flats** | **Greasewood Fans and Flats** | **Sand Dune Complex (Shrubland)** |
| *Vulpes velox* | Swift Fox | | X | X | | | | | | | | | |
| **Bears** | | | | | | | | | | | | | |
| *Ursus arctos* | Grizzly bear | | | | X | | X | X | | | | | |
| **Weasels and Allies** | | | | | | | | | | | | | |
| *Conepatus leuconotus* | Common Hog-nosed Skunk | | | | X | | X | X | | X | X | X | X |
| *Gulo gulo* | Wolverine | | | | | | | | | | | | |
| *Lontra canadensis* | River Otter | | | | | | | | | | | | |
| *Mustela nigripes* | Black-footed Ferret | | X | X | X | | | | X | X | | | |
| **Cattle and Allies** | | | | | | | | | | | | | |
| *Bison bison* | Bison | | | | | | | | | | | | |
| **Cats** | | | | | | | | | | | | | |
| *Lynx canadensis* | Lynx | | | | | | | | | | | | |

Table C8, Part C - Mammals - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| **Shrews** | | | | | | | | | | | | | | | | |
| *Sorex nanus* | Dwarf Shrew | X | X | X | X | X | X | X | X | | X | X | | | | |
| *Sorex preblei* | Preble's Shrew | | | | | | | | | | | | | | | |
| **Bats** | | | | | | | | | | | | | | | | |
| *Euderma maculatum* | Spotted Bat | X | | X | | | X | | X | | X | X | | | | X |
| *Idionycteris phyllotis* | Allen's big-eared bat | | | | | | X | | X | | X | | | | | X |
| *Myotis occultus* | Arizona myotis | X | X | | | | X | | X | | X | X | | | | |
| *Myotis thysanodes* | Fringed myotis | X | X | X | X | | X | | X | | X | X | | | | X |
| *Plecotus (Choynorhinus) townsendii pallescens* | Townsend's Big-eared Bat Subsp | X | X | X | | | X | | X | | X | X | | | | |
| **Rabbits and Hares** | | | | | | | | | | | | | | | | |
| *Lepus townsendii* | White-tailed Jackrabbit | | | | | | | | | | | | | | | |
| **Squirrels** | | | | | | | | | | | | | | | | |
| *Cynomys gunnisoni* | Gunnison prairie dog | | | | | | | | | | | | | | | |
| *Cynomys leucurus* | White-tailed prairie dog | | | | | | | | | | | | | | | |
| *Cynomys ludovicianus* | Black-tailed prairie dog | | | | | | | | | | | | | | | |
| **Pocket Gophers** | | | | | | | | | | | | | | | | |
| *Thomomys bottae rubidus* | Botta's Pocket Gopher (rubidus ssp) | | | | | | | | X | | | | | | | |
| *Thomomys talpoides macrotis* | Northern pocket gopher (macrotis ssp) | | | | | | | | | | | | | | | |
| *Perognathus fasciatus* | Olive-backed pocket mouse | | | | | | | | | | | | | | | |
| **Jumping Mice** | | | | | | | | | | | | | | | | |
| *Zapus hudsonius preblei* | Meadow Jumping Mouse (both subspecies) | | | | | | | | | | | | | | | |
| **Dogs and Allies** | | | | | | | | | | | | | | | | |
| *Canis lupus* | Gray Wolf - two subspecies (Northern and Mexican) | X | X | X | X | X | X | X | X | X | X | X | X | X | | |

Table C8, Part C - Mammals - Habitat associations of species of greatest conservation concern (Science Forum Results).

| | | Forestlands | | | | | | | | | | | Tundra | | Unvegetated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Aspen Forest** | **Spruce-Fir** | **Douglas Fir** | **Lodgepole Pine** | **Limber Pine** | **Ponderosa Pine** | **White Fir** | **Pinyon-Juniper** | **Rocky Mountain Bristlecone Pine** | **Mixed Conifer** | **Mixed Forest** | **Shrub Tundra** | **Meadow Tundra** | **Sandy Areas** | **Exposed Rock** |
| *Vulpes macrotis* | Kit Fox | | | | | | | | | | | | | | | |
| *Vulpes velox* | Swift Fox | | | | | | | | | | | | | | | |
| **Bears** | | | | | | | | | | | | | | | | |
| *Ursus arctos* | Grizzly bear | X | X | X | X | X | X | X | | X | X | X | X | X | | |
| **Weasels and Allies** | | | | | | | | | | | | | | | | |
| *Conepatus leuconotus* | Common Hog-nosed Skunk | | | | | | | | X | | | | | | | |
| *Gulo gulo* | Wolverine | X | X | | X | X | | X | | X | X | X | X | X | | X |
| *Lontra canadensis* | River Otter | | | | | | | | | | | | | | | |
| *Mustela nigripes* | Black-footed Ferret | | | | | | | | | | | | | | | |
| **Cattle and Allies** | | | | | | | | | | | | | | | | |
| *Bison bison* | Bison | | | | | | | | | | | | | | | |
| **Cats** | | | | | | | | | | | | | | | | |
| *Lynx canadensis* | Lynx | | X | X | X | | | X | | | X | | | | | |