

Wildlife, Development, & Climate Change

March 2019



Jeff Ver Steeg, Acting Director, CPW



Presentation Topics

- The State of Wildlife in Colorado
- The Impact of Climate Change on Wildlife
- The Impact of Development/Encroachment on Wildlife
- Examples of What Communities Are Doing To Address these Impacts

The State of Wildlife in Colorado

- Home to > 960 species of mammals, birds, fish, reptiles, amphibians, mollusks, & crustaceans
- Also many hundreds (perhaps thousands) of plant & invertebrate animal species that fall outside of CPW's authority
- We are blessed with a great variety of habitat types (created in part by topography)
- Some of largest elk & pronghorn herds in the US
- Moose population continues to expand in size and distribution



Challenges

- Colorado's human population expected to increase dramatically in the next 30 years (to 8.1 million by 2050)
- Some elk herds (SW/SE, but also mountain areas like the Eagle Valley) & Steamboat Springs exhibiting poor recruitment & difficulty maintaining population size
- The demand for recreation opportunities is rapidly expanding into formerly secure habitats as the duration of the recreation season expands, the intensity of use increases, & access to the backcountry becomes easier (bicycles, e-bikes, and OHVs)

Challenges, cont.

- Recreation trend intensified within past decade
- Especially noticeable around mountain ski resorts & nearby federal lands, where traditional winter recreation seasons have expanded into heavily marketed, year-around markets
- Increased recreation impacts can interact with other types of development (residential and commercial development, oil & gas and other energy development) to reduce the availability & effectiveness of wildlife habitat in new ways

Mitigation Actions

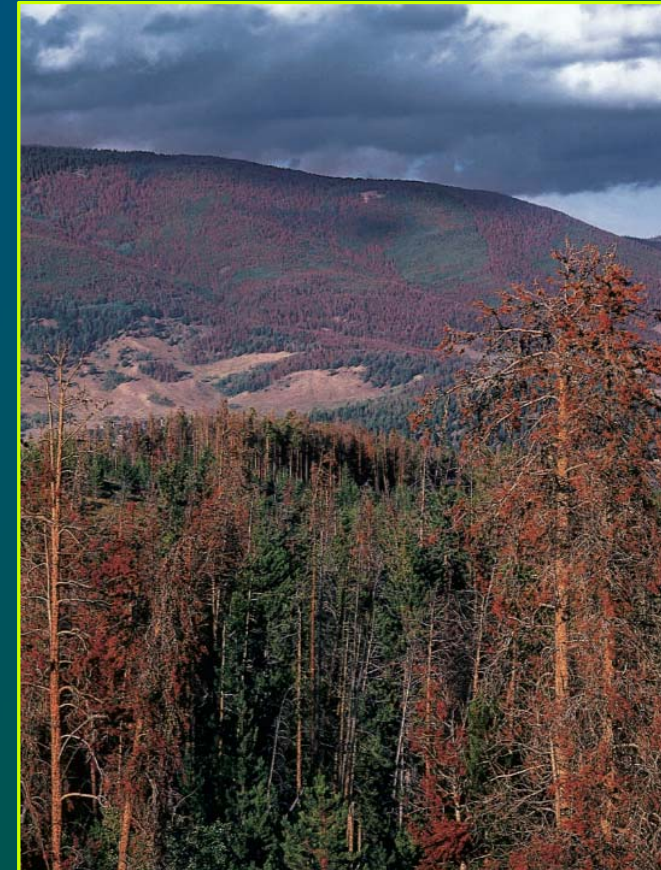
- Well-planned recreation can be compatible with wildlife conservation
- Direct activities into low or lower-quality habitats
- Limit activities during crucial periods of the year (e.g., breeding)
- Spatial buffers and temporal restrictions to minimize impacts
- Conduct research/monitoring to better understand the impacts of recreation on wildlife

The Impact of Climate Change on Wildlife

- Colorado Climate Plan 2018 Update
- Modeling out to 2050 indicate all areas of the state likely to experience some degree of warming
- Precipitation projections are more variable - some models project drier & some project wetter.
- CPW entrusted with responsibility to perpetuate fish & wildlife resources and ensure compatible outdoor recreational opportunities for current & future generations
- Impacts are as varied as ecological systems and species

The Impact of Climate Change on Wildlife, Cont.

- Research suggests shorter bear hibernation periods - could be beneficial (less energy required to survive winter/rear young) and/or detrimental (potential for increased bear/human conflicts)
- Changes include increasing spread of insects & invasive species (e.g., beetle kill), elevating the severity of forest wildfires
- Altering precipitation/ temperature & thus habitats that support plant, fish, & wildlife species



Mountain area covered with beetle kill

The Impact of Climate Change on Wildlife, Cont.

- Grassland ecosystems (already dry) especially impacted by drought & changed precipitation patterns
- Most habitat will not shift quickly, but within the 30-year timeframe, likely begin to see altered ecosystem composition
- Ability to move key to some wildlife responses (e.g., birds vs. amphibians/reptiles)



Great Plains Toad



Grasslands Habitat

The Impact of Climate Change on Aquatic Wildlife

- Aquatic species in Colorado uniquely affected by climatic changes
- Increased temperatures/decreased precipitation result in higher water temperatures & reduced stream flows
- Could increase the spread of non-native species/ diseases
- Fluctuating water levels in reservoirs impact fish populations



Eurasian Watermilfoil



Quagga & Zebra Mussel



Rusty Crayfish

The Impact of Climate Change on Aquatic Wildlife, Cont.

- Expect impact on high-elevation, cold water cutthroat-trout
- Eastern Plains fish survival & movement jeopardized
- Fish passage features improve connectivity stream connectivity & allow fish to migrate to avoid becoming stranded in areas of unsuitable



Redbelly Dace



Management Actions to Improve Resilience

- Fish Passage:
 - Allow fish to complete life cycles
 - Movement to thermally favorable locations
- Increase summer flows & protect cold water sources:
 - Prevent stranding
 - Directly cool temperatures
- Habitat Improvement:
 - Increasing channel complexity
 - Provide refugia during low flows
 - Increasing riparian vegetation to provide shading



**Fossil Creek Reservoir
Inlet Diversion,
Cache la Poudre River**

Fish Passage

Recreational Impacts from Increasing Population/Development

- More residents & high tourist visitation means = crowding, maintenance backlogs & conflicting outdoor pursuits
- ~ 92% of Coloradans recreate in the outdoors at least once every few weeks & some \geq four times/week
- Colorado's outdoor recreation economy generates ***\$62.5 billion in economic output*** (direct spending on travel/equipment purchases & ripple effects across other sectors)



Recreational Impacts from Increasing Population/Development, Cont.

- SCORP top three barriers to Coloradans' recreation participation were:
 - limited time
 - traffic congestion
 - crowding
- Land managers concerned about crowding - top management issue:
 - maintaining existing recreation infrastructure & resources



Recreational Impacts from Increasing Population/Development, Cont.

- Followed by:
 - challenges adapting to changing user needs or preferences
 - coordinating with other outdoor recreation agencies & organizations
 - Capacity to serve a growing population
- The top three visitor service issues identified:
 - enforcing responsible use
 - providing programs to engage youth
 - maintaining visitor safety



Impacts of Development/Encroachment of Wildlife

- New/larger highways & increased traffic volume further fragments habitat & impedes movement
- Energy development can affect some species (increased traffic, disturbance & habitat changes)



Impacts of Development/Encroachment of Wildlife, Cont.

- Housing development
 - permanent habitat loss & reduced winter range habitats for ungulates
 - exacerbates carnivore/human conflict potential (bears/lions)
- Year round recreation & trail development puts tremendous amount of pressure on ungulates during winter months as well as mating seasons & calving seasons.



Examples of What Communities Are Doing to Address Development/Encroachment

- Manitou Springs

- In 2018 implemented a new ordinance requiring people to secure their trash from bears, & prohibited feeding of wildlife except birds

- Woodland Park:

- In 2018 passed an ordinance prohibiting feeding wildlife (except birds)
- Developing an urban deer management plan this winter for implementation in the fall of 2019, most likely option at this time is an urban archery hunt



Examples of What Communities Are Doing to Address Development/Encroachment, Cont.

- Colorado Springs:
 - Ongoing stakeholder & public meetings to discuss urban wildlife issues.
 - Limited archery deer hunting to address damage within city limits since 2016
 - City adopted a wildlife feeding ordinance at the end of 2018, & will consider a bear trash ordinance in March
 - In 2018 City of Colorado Springs put out RFP to create an urban deer management plan



Examples of What Communities Are Doing to Address Climate Change

- Seventeen communities (including Aspen, Basalt, Boulder, Carbondale, Denver, Dillon, Durango, Frisco, Glenwood Springs, Gunnison, Ignacio, Nederland, New Castle, Pagosa Springs, Telluride, Crested Butte, and Westminster) signed U.S. Conference of Mayors Climate Protection Agreement, pledging to meet or beat the Kyoto Protocol emission reduction targets (2015 Colorado Climate Plan: pg. 71)
- 2018 Update includes additional commitments outlined in a 2017 executive order by Gov. Hickenlooper

Examples of What Communities Are Doing to Address Climate Change, Cont.

- Denver:

- 2018 Denver 80X50 Climate Action Plan – One of the first large U.S. cities to adopt a CAP in 2007. First GHG inventory in 2005
- One of the first to sign the Mayors Climate Protection Agreement, Mayors National Climate Action Agenda, & Global Covenant of Mayors for Climate & Energy
- 2018 Denver Green Roof Initiative requires that new buildings & some existing ones have certain percent cover of green space, solar panels or other environmental options

- Fort Collins:

- Joined Cities for Climate Protection Campaign in 1997
- Adopted Colorado's 2007 CAP goals, then created own CAP
- Accelerated goals in 2015 and published a CAP Framework

Examples of What Communities Are Doing to Address Climate Change, Cont.

- Boulder County:

- Climate webpage includes 2013 Boulder County Sustainability Plan (updated in 2018) & 2012 Climate Change Preparedness Plan
- EnergySmart Program is a partnership between Boulder County, City of Boulder, City of Longmont & local utilities
- 2018 Greenhouse Gas Inventory & Emission Reductions Strategies Report provides latest GHG status & goals

- Boulder:

- First official climate action taken in 2002 when city council passed Kyoto Resolution
- Climate webpage includes 2017 Climate Commitment document and outlines city programs, such as the CAP Tax, SmartRegs, & Building Performance Ordinance
- 2016 Boulder Resilience Strategy was one of the first plans completed through the Rockefeller Foundation's 100 Resilient Cities Program

Examples of What Communities Are Doing to Address Climate Change, Cont.

- Grand Junction:
 - Ongoing biogas project uses digester gas produces at wastewater treatment facility to fuel transit fleets
 - Other conservation efforts include purchase of CNG fleet vehicles & solar Installations
- Rifle:
 - Produces highest per-capita solar energy in nation (as of 2015) thanks to Renewable Energy Program started in 2009
 - Achieved net-zero status, producing more energy than it takes in

Examples of What Communities Are Doing to Address Climate Change, Cont.

- Garfield County:
 - Launched the Garfield Clean Energy Collaborative in 2012 via DOLA grant
 - Created regional government collaborative to help households, businesses & local governments transform energy use
 - 2017 Energy Action Plan targets new areas of focus for energy efficiency gains in the county
 - Local CAP's (includes Carbondale, Glenwood Springs, New Castle)
 - 3 major programs: Renewable Energy, Energy Efficiency & Petroleum Independence
 - Used portion of DOLA grant to install 23 renewable energy systems on county buildings

Examples of What Communities Are Doing to Address Climate Change, Cont.

- Carbondale:
 - 2017 Climate & Energy Action Plan (original plan from 2006)
 - Growing a clean energy economy for the last 20 years
 - Other efforts: Residential Efficient Building Program, financing solar arrays, expanding bicycle & pedestrian network

Jeff Ver Steeg, Acting Director