

**Colorado Wolf Restoration and Management Plan
Technical Working Group (TWG) to Colorado Parks and Wildlife (CPW)**

**Draft/Deliberative Report on
Recommendations for Colorado State Listing/Delisting Thresholds and Phasing
Not for Circulation beyond SAG, TWG, CPW, and Keystone**

March 2022

Background & Purpose

This draft document summarizes the Wolf Restoration and Management Plan Technical Working Group (TWG) recommendations regarding population recovery thresholds for downlisting and delisting gray wolves from the state endangered species list in Colorado. As of February 10, 2022, wolves are listed under the Federal Endangered Species Act as Endangered. This effort does not replace a federal recovery plan, nor does it outline federal recovery goals. This effort describes state management of a species for when management authority is returned to the state (i.e., Federally delisted). This effort may inform development of Federal rulemaking processes in the interim, in particular consideration of development of a 10(j) Experimental, Non-Essential designation.

The thresholds were developed through expert deliberation of TWG members and are presented in a phased framework. While the determination of these thresholds is a technical exercise, management actions corresponding to the phased framework should be informed by legal and social considerations, which will be addressed largely by the Stakeholder Advisory Group (SAG). The framework is presented below (page 2) and is followed by a summary of TWG discussion and rationale.

Colorado State definitions for state endangered and threatened species are as follows:

- Endangered Species (CRS 33-1-102 (12)): any species or subspecies of native wildlife whose prospects for survival or recruitment within this state are in jeopardy as determined by the commission.
- Threatened Species (CRS 33-1-102 (44)): any species or subspecies of wildlife which, as determined by the commission, is not in immediate jeopardy of extinction but is vulnerable because it exists in such small numbers or is so extremely restricted throughout all or a significant portion of its range that it may become endangered.

Colorado Gray Wolf Population Listing/Delisting Phased* Framework

	Phase 1 <i>(correlating with State Endangered status)</i>	Phase 2 <i>(correlating with State Threatened status)</i>	Phase 3 <i>(correlating with State delisted, nongame status)</i>	Phase 4 <i>(correlating with State delisted, game status)</i>
Start	Current (2022)	Minimum count of 50 wolves anywhere in Colorado for four successive years.	Phase 1 and Phase 2 conclusion requirements are both met. Phase 2 requirements may be met concurrently with Phase 1 requirements.***	Discretionary phase, not prescriptive nor legally required. A minimum count above the delisting threshold would be required, but not necessarily sufficient, depending on other biological and/or social factors.
Conclude	Minimum count** of 50 wolves anywhere in Colorado for four successive years.***	Minimum count of 150 wolves anywhere in Colorado for two successive years**** -OR- Minimum count of 200 wolves anywhere in Colorado with no temporal requirement.	No prescribed conclusion; not legally required.	No prescribed conclusion.
Action upon conclusion	Downlist to State Threatened.	Delist from Colorado State list	Consider reclassifying to game species.	N/A
Criteria to move back into this phase	After downlisting, a minimum count of less than 50 wolves anywhere in Colorado for two consecutive years initiates review of relisting to State endangered status.	After delisting, a minimum count of less than 150 wolves anywhere in Colorado for two consecutive years initiates review of relisting to State threatened status.	To be determined depending on whether and under what criteria a game reclassification is made.	N/A

Notes on framework:

*Phases will be dictated by numeric and temporal wolf population thresholds described in the table. While it is intended that state status will also correspond to these thresholds, there may be a time lag as the Parks and Wildlife Commission undertakes the procedural process to change the state status based on population counts.

**Minimum population counts in any phase include gray wolves that have been reintroduced to Colorado and those that have naturally migrated into the state and their progeny. Wolf population minimum counts in this table refer to counts conducted in late winter to most accurately reflect recruitment.

***"Successive" means years in a sequence, with any number of gaps in between. Consecutive means years in a sequence with no gaps.

**** Downlisting to State Threatened status may not occur until the four-successive year requirement is met in the State Endangered status phase 1 (Phase 1). However, the two-successive year timeline for the phase 2 minimum count requirement begins when the minimum number is first met and may occur concurrently while in the Phase 1/endangered phase. Consequently, it is possible that delisting (Conclusion of Phase 2) may occur immediately after Phase 1, should the Phase 2 requirements be met concurrently during Phase 1.

Discussion and Rationale

The TWG generally **supports a phased approach** to gray wolf downlisting, delisting and management:

- It provides clarity for current and future management while supporting the statutory goal of managing for a self-sustaining wolf population.
- It can allow for increasing management flexibility as the wolf population increases, as well as for flexibility to manage conflict throughout all phases.
- Other states have similarly used phased approaches to managing their wolf populations.
- It is important to maintain public trust in CPW in each phase of restoration and management by being responsive to current and future conditions of conflict, social conditions, and wolf population trends.
- Thresholds for phasing are based on best available science and meet all requirements under state statute.
- Some members suggested that linking the specific population metrics, rather than state listing status, to management options would lend to more management flexibility – particularly if delisting actions are tied up in litigation when the population hits the corresponding population metric. However, others suggested linking listing status directly to management phases would simplify messaging and expectations for field staff and members of the public. The difference in management options currently allowed under State law for endangered and threatened listing statuses is relatively inconsequential. The framework suggests that the population metrics should correspond with state status, but they are not directly linked: it is expected that once the wolf population reaches the metrics defined for downlisting/delisting, the management flexibility defined by the subsequent phase will be immediately in place, while at the same time the Colorado Parks and Wildlife Commission undertakes the processes to take the necessary action to down/delist the species. There may be a procedural delay when moving from Phase 2 to Phase 3.

The TWG generally **supports minimum population count with a temporal threshold to downlist wolves from state endangered to state threatened and to delist wolves.**

- *Rationale for recommendation of minimum population count as the relevant metric for downlisting and delisting:*
 - The social behaviors and resiliency of wolf populations, specifically wolves' tendency to form packs and documented reproductive success, support a minimum population count to satisfy the technical specifications of CRS 33-2-105.8 to restore a self-sustaining population of wolves to Colorado.
 - At the population level, the reproductive potential of a greater number of smaller packs or a smaller number of larger packs does not significantly differ and thus supports population counts rather than a minimum number of packs, although tracking pack statistics may be useful to document population stability and growth.
 - There are differing definitions of a 'pack' found in the scientific literature and in different states' management plans. In various contexts, a pack has been defined as 2 wolves, 4 wolves, or a breeding pair and two litters from different years.
 - Defining management thresholds around breeding pairs will be difficult and expensive to monitor as the population grows.

- Geographic distribution metrics were discussed as potential thresholds, but some suggested that this may be at odds with Colorado's 2004 wolf working group recommendations to allow wolves that do not cause conflict to live without bounds.
- A minimum count is recommended in the early phases of reintroduction. A minimum count is more labor and resource intensive, however it is beneficial for accuracy of monitoring and both technical and social confidence in informing downlisting and delisting decisions and management. Minimum population counts can be more accurate at lower population sizes than they are at higher population sizes.
- As the wolf population grows, minimum population counts are more difficult to conduct and are less reliable for understanding total population size.
 - As the wolf population grows larger, and upon transition to delisted status, consider the use of a minimum population estimate and/or population models as a more reliable metric, i.e., models based on distribution, vital rates and abundance estimates, et al.
 - Minimum counts will be important to compare with and validate mark-resight population estimates throughout reintroduction and management phases.
 - Weather, staffing and other unforeseen events can affect ability to conduct minimum counts.
- *Rationale for temporal component to minimum population metric:*
 - A temporal threshold of multiple successive years after minimum population counts were met in each phase was suggested as a measure of persistence in population trends.
 - Members suggested interaction between minimum population count and the length of time could accommodate rapid or slow population growth. For example, rapid population growth could eliminate the need for a temporal requirement between phases.
 - 'Successive' means years in a sequence, with any number of gaps in between. 'Consecutive' means years in a sequence with no gaps.
 - Members suggested that a temporal requirement of successive minimum population counts for downlisting are important to ensure a trend of a stable or increasing population, to account for the potential temporary population increases that may occur through reintroduction, and to allow for temporary fluctuations in population and/or unforeseen monitoring challenges over time.
 - Members suggested that review of State relisting (to threatened or endangered status) should be initiated when thresholds are not met for two consecutive years; this allows for potential temporary population decreases and/or unforeseen monitoring challenges that may affect minimum count while also initiating timely review should counts fall below threshold two years in a row.
- *Additional considerations for minimum population counts:*
 - Minimum counts for delisting are NOT intended as population objectives or maximums.
 - In recommending specific minimum population counts for downlisting and delisting, the TWG cited wolf population trends, modeling efforts, other wolf recovery efforts, literature review of population modeling, and criteria for phased management elsewhere.
 - Minimum counts should include wolves that have naturally migrated to Colorado and their progeny as well as those that were reintroduced.

- While wolf monitoring occurs throughout the year, the wolf population minimum count to inform downlisting/delisting decisions should be held in late winter to most accurately reflect recruitment.
- *Considerations for spatial distribution and ecological niche:*
 - The social and spatial tendencies of gray wolves suggests that 150-200 wolves would distribute among several million acres of territory in Colorado; spatial occupancy can be estimated based on literature regarding pack and territory size.
 - Minimum population count as a metric for State downlisting and delisting is thus correlated with spatial distribution.
 - Spatial distribution, ecological function and the 3Rs model (representation, redundancy, resiliency) are important considerations and goals for conservation.
 - Given the large-scale movements and natural history of wolves, the 3Rs approach is more relevant for larger or rangewide conservation (i.e., throughout all of the Lower 48 contiguous United States), however, is less relevant at the scale of Colorado for state reintroduction and down/delisting metrics.
 - Positive ecological effects from having wolves on the landscape can occur, however they are difficult to quantify and document, require appropriate scale, and are also situation-specific.
 - Ecological effectiveness is a vague concept and situation-specific; for example, positive effects of a full complement of large carnivores in Yellowstone may not apply in other areas.
 - Ecological effectiveness and trophic cascades across a large area do not fully occur until there is a saturated wolf population. However, social carrying capacity and conflict in human-dominated landscapes will impact pack size and distribution and will likely limit achievement of ecological carrying capacity.
 - Landscape level ecological effects are thus both difficult to quantify and to achieve, and are not appropriate as a metric or criteria for State downlisting and delisting.
- *Considerations for connectivity:*
 - Measures of genetic health and/or connectivity, such as measuring adequate heterozygosity from blood or tissue samples, are important metrics that should be periodically monitored over time as an indicator of a self-sustaining population.
 - Indicators of genetic connectivity are not necessary as a threshold for State downlisting and delisting. If wolves from the Northern Rockies or Pacific Northwest are sources for reintroduction, and wolves continue to disperse into Colorado from neighboring areas, the genetic makeup of Colorado wolves will already reflect the genetics of these areas. Colorado's wolf population is demographically connected to other populations in the Northern Rockies. Colorado thus does not require higher numeric population downlisting/delisting thresholds set for other locations that lack spatial connectivity.
- *Considerations for species reclassification and management after wolves are delisted:*
 - As noted above, connectivity is an important indicator for long-term monitoring, as it contributes to a self-sustaining population.
 - Reclassification of gray wolves from nongame to game status would be a phase discretionary to the Colorado Division of Parks and Wildlife, rather than a prescribed

phase. Reclassification to game species is not legally required nor discussed by statute CRS 33-2-105.8.

- Determination of whether to move to game classification should include consideration of social input regarding acceptability of wolf harvest and means of take, demand for population size management, impacts from conflict, and/or demand for harvest opportunity. There are advantages to early discussion on this topic, however learning will also occur over time.
- There should be clarity on the objectives of reclassification, for example, more liberalized management of conflict vs. management of populations through regulated hunting.
- Technical considerations regarding potential objectives for reclassification include:
 - Consideration of reclassification should require maintenance of a minimum population estimate greater than the delisting threshold, with a sufficient buffer to avoid the need to relist.
 - The link between wolf population management and conflict reduction is not necessarily robust on a statewide basis:
 - There are not necessarily more depredations with higher statewide wolf populations.
 - It is difficult to manage wolf populations through conflict management alone.
 - In the absence of a population target, population management is not necessarily relevant. Any population management objective should be based in science as well as consider the social input noted above.
 - If using regulated hunting for population management, it is more effective when the wolf population is smaller.
 - Ungulate population impacts could also be considered as a management threshold when wolf populations are larger.