Creating Coexistence Plans
Non-lethal methods for modern wildlife management
Conservation is a state of harmony between (hu)man and land.

~ALDO LEOPOLD
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Communities can create collaborative coexistence plans to ensure wildlife are conserved with modern and ethical methods.
Executive Summary

Mountain lions outside Los Angeles. Coyotes in a neighbor’s backyard. Black bears near the bird feeder. Wildlife are sometimes found in close proximity to humans, providing wonderful opportunities to observe and learn about wild animals. Sometimes, though, this proximity presents challenges and inconvenience to regular human activity. Increasingly, wildlife experts are realizing that reacting to human-wildlife interactions with lethal control is counterproductive and ineffective. Accordingly, local communities across the country are seeking ways to coexist with, rather than kill, native wildlife. This document is a toolkit for helping communities create their own wildlife coexistence plans.

Wildlife are managed in the “public trust”, which means that all citizens ostensibly have an equal voice in wildlife conservation. As an American citizen, you have a say in how wildlife are managed (or if they need to be managed at all). You also have the ability to inform and contribute to your community’s treatment of local wildlife.

Communities can create collaborative coexistence plans to ensure wildlife are conserved with modern and ethical methods that consider the interests of everyone in the community. The best available science on modern wildlife management indicates non-lethal techniques are more effective to prevent predation on domestic animals and reduce costs over the long-term. Coexistence plans: a) should set strategic goals that address best practices, land use needs, financial resources, collaborative planning, legal authorities and enforcement; b) be drafted and finalized through collaboration among all interested stakeholders; and c) are context dependent and require adaptive responses over time.

We recommend coexistence plans contain at least the following:

- A background section outlining local wildlife and ecosystems and the legal authorities of federal, state and local governments
- A statement of the coexistence plan’s goals and justifications for those goals
- Plans for implementation of goals, particularly conflict prevention
- A way to report potential human-wildlife conflict
- Funding available, if applicable
- A plan for education and outreach
- Penalties for non-compliance with the plan
- An adaptive management procedure for evaluating and revising the plan
1. WHY DEVELOP A COMMUNITY COEXISTENCE PLAN?

The purpose of this document is to provide guidance to communities developing wildlife coexistence plans, with the ultimate objective of improving outcomes for human activities, native wildlife and ecosystems on multi-use public lands. Collaboratively, communities can create and participate in conservation activities that guide them in coexisting with wildlife and reaping the benefit of the many services that native species provide while preventing potential conflict between humans, livestock and wildlife.

Coexistence plans are needed to replace current lethal control programs for three main reasons. First, wildlife are managed in the public trust and thus all citizens have a voice in wildlife conservation and management. Current lethal control programs do not take into account the interests of diverse stakeholders (i.e., people who are impacted by or have an interest in wildlife) who want to experience healthy ecosystems with their full complement of native species. Second, the best available science on modern wildlife management indicates non-lethal coexistence with wildlife is a less expensive and more effective option in the long-term than lethal control. Lastly, lethal control techniques are rarely humane. The most common lethal tools—traps, snares, poisons and aerial gunning—cause animals undue pain and suffering, which is now considered by veterinarians, wildlife scientists and managers, and average Americans as unethical, cruel and unnecessary.
In short, coexistence is practical, effective, supported by modern science and in line with public opinion and contemporary ethics. With this understanding at its foundation, this document is intended to provide guidance through the stages of coexistence plan development and includes a suite of recommended actions for coexisting with native wildlife. Local contextual factors, such as habitat types, terrain, species of wild and domestic animals involved, human population distribution and density, must be considered in addition to the outlined guidelines in this document. We include additional resources for identifying vendors, organizations and individual experts who can help communities create highly-refined, locally-adapted plans.

1.1. Why Prioritize Non-Lethal Methods Over Lethal Control?

The costs of lethal control outweigh any potential benefits. Lethal methods are indiscriminate and highly dangerous. Traps, snares and poisons can seriously injure or kill non-target wildlife, domestic companion animals, and even people. Aerial gunning disturbs non-target wildlife, degrades recreation in impacted areas, is very expensive and can end in tragedy when helicopters or planes crash. Furthermore, the costs of lethal control are not always reflected in actual prices for the associated tools and services. Such costs include: companion animals’ loss of life and limb, non-target animal deaths (both domestic and wild), disruption of stable carnivore social structures that increases conflict, overpopulation of prey populations (e.g., crop-raiding rodents), and negative impacts to ecosystems (e.g., lower biodiversity, loss of ecosystem services). Lethal control is labor intensive and often creates conflict that did not exist in the first place, which perpetuates a greater need to invest resources rather than providing actual and long-lasting solutions.

Non-lethal control is proactive and prevents attacks on domestic animals from occurring in the first place, as opposed to reactive and ineffective lethal control. Non-lethal methods are also more cost-effective in the long term and avoid the negative impacts to non-target animals and stable, healthy ecosystems. Federal and state agencies increasingly recognize that alternatives to lethal control should always be explored first. Likewise, local coexistence plans should prioritize non-lethal control.

Traps, snares and poisons can seriously injure or kill non-target wildlife, domestic companion animals, and even people.
2. DETERMINING THE PURPOSE OF YOUR COMMUNITY’S COEXISTENCE PLAN

The first step in creating a coexistence plan is to determine the purpose of the plan and what authorities are granted to each jurisdiction to conserve wildlife. The community should have clarity about why wildlife conservation is important and direction for effective methods. Some strategies will most likely focus on conflict prevention, and may also involve addressing continued loss of habitat or prey populations that can drive human-wildlife conflict.

Important questions to answer that will help in determining the ability to implement coexistence plans include:

1. **What are the current federal and state legal designations** of wildlife and do these designations provide protections in the plan area?
   a. Endangered Species Act (ESA) listing. This federal designation applies to species such as Mexican gray wolves, Canada lynx and black-footed ferrets.
   b. Bureau of Land Management and the U.S. Forest Service also list species of concern.
   c. State listings may include “species of special concern,” “threatened” or “endangered,” or “Species of Greatest Conservation Need” as identified under state law or regulation.

2. **What laws or management plans** currently exist for (locally, state, and federally managed) public lands in the plan area?

3. **What laws have granted powers** to local governments to protect wildlife?

4. **Whether and how** to address private lands and private landowner rights?

5. **What are other barriers** to wildlife conservation in the coexistence plan area (e.g., neighboring properties, jurisdictional boundaries)?

6. **Who are the stakeholders** in favor of and in opposition to wildlife conservation and why?

These types of preliminary questions identify what protections wildlife in the plan area require, how to fill in coexistence plan gaps, and who to engage in the planning process.
3. WHAT TO EXPECT WHILE DEVELOPING A COEXISTENCE PLAN

3.1. Timeline and Commitment

A realistic timeline for wildlife coexistence plan advancement and acceptance likely include drafting, circulating for public comment, revising, and finalizing that may also include formal public hearings.

Steps in the process may include:
1. **Collection** of information on local wildlife
2. **Recruitment** of stakeholders interested in wildlife conservation
3. **Education & outreach**
4. **Identification** of funding sources, budgets & staffing needed
5. **Agreement** to adopt a plan
6. **Plan writing**
7. **Plan adoption**
8. **Plan evaluation & revision**
9. **Final public hearing & implementation**, return to Step 8 as needed

Wildlife coexistence plans are best suited for adaptive management. Adaptive management is a systematic approach for improving resource management by implementing management actions, monitoring outcomes, drawing conclusions from monitoring data, and revising management approaches if assessment suggests that the existing management action is not achieving the desired outcomes. Adaptive management needs to include monitoring and review. Wildlife coexistence plans must be revisited at stated intervals or when key benchmarks are met or laws change to make adjustments as needed by each community.

3.2. Involving Stakeholders

Coexistence plans will be more robust and withstand the test of time if all stakeholders are sufficiently involved in the process.
The process might look something like this:

1. **Contact** county government to gauge interest and identify an employee to serve as a liaison between stakeholders and the government

2. **Identify and reach out** to all stakeholders interested in wildlife conservation

3. **Form** a citizen advisory board among the interested stakeholders that meet the following criteria:
   a. Supportive of wildlife conservation and, if applicable, local agriculture
   b. Able to dedicate appropriate levels of time to the process
   c. Enthusiastic about learning about new tools and promoting the coexistence plan

4. **Identify and partner** with organizations and/or professionals with necessary expertise in modern livestock husbandry practices, non-lethal wildlife management, carnivore behavior, local ecology, and/or human-carnivore conflict
   a. Some useful institutions and individuals to consider include local wildlife centers, environmental non-profit organizations, university scientists, state and federal wildlife biologists, U.S. Department of Agriculture Farm Service Agency and Natural Resource Conservation Service, Natural Resources Districts

5. **Engage partners** and all stakeholders including potential opposition to come to a mutually beneficial agreement
   a. Consider hiring a professional facilitator to guide decision-making process among diverse stakeholders of the citizen advisory board

**Coexistence plans will be more robust and withstand the test of time if all stakeholders are sufficiently involved in the process.**
4. ELEMENTS OF A COEXISTENCE PLAN

4.1. Background

For educational purposes, coexistence plans could include a background section that discusses relevant wildlife natural history and biology and the impetus for creating the coexistence plan.

4.2. Plan Goals

The plan should have clear goals that are coordinated with federal, state, and local conservation goals. To be effective and adaptive over time, coexistence goals should be context-dependent, informed by the best available science and formed through collaborative decision-making with all involved stakeholders. Many models and examples for local collaborative decision-making processes regarding wildlife exist (See Sections 4.8 and 5).

Important points to keep in mind while setting wildlife conservation goals:

1. Some wildlife species, such as prairie dogs or wolves, do not inhabit the entirety of their geographic range, but rather occupy portions of it at different times in response to environmental factors or distribution of prey populations. As wildlife populations expand and contract over time, ensuring connectivity between wildlife populations will benefit long-term wildlife persistence and overall health of ecosystems. Retention of both small and large wildlife populations is important.

2. Planning for wildlife conservation means balancing wildlife and human needs well into the future. What are the current needs and what will be needed in 50 years, 100 years, perhaps even 200 years into the future?

4.2.1. Types of Goals

Wildlife management goals can be qualitative (measured by quality) or quantitative (measured by quantity). Qualitative goals provide flexibility but can be vague and difficult to analyze for success or failure. Quantitative goals are measurable but can also be limiting if additional opportunities for conservation present themselves after the goal has been met.

Quantitative goals are attractive because “How much wildlife is enough?” is a common question raised during the planning process. For quantitative goals, if the goal is a specific number of wildlife species or population sizes, the community can decide how they wish to measure those numbers. Alternatively, quantitative goals can focus on measurements of human-wildlife interactions. The community
may determine a maximum number of conflict interactions that is acceptable before certain actions are taken. Conflict interactions can also be rated from low (e.g., sightings of a carnivore in a neighborhood) to high (e.g., confirmed attacks on livestock). For example, a community may decide that a certain number of conflicts between dogs and coyotes must be reported before stricter leash laws or harassment of coyotes are implemented and enforced.

4.2.2. Goals for Habitat Protection/Enhancement on Public Lands

Public lands are those managed by local, state, and federal agencies for the benefit of all people. These lands provide the best opportunities for wildlife habitat conservation. Because municipalities generally have stronger buying power than individuals, they also have more opportunities to preserve large wildlife populations and habitats.

Wildlife habitats located on public lands provide some of the best opportunities for restoration of vegetation, re-establishment of native wildlife, public education, and tourism. As they are usually used by humans as well, these areas are important for community outreach to students, community members, and visitors. Coexistence plans should consider addressing habitat restoration or minimal habitat disturbance, public education, and non-lethal management of wildlife on public lands. Setting aside suitable but unoccupied wildlife habitat saves valuable resources, presents a good public image and reduces conflict.

4.2.3. Integration of Plan Goals with State and Federal Goals

Local coexistence plans are strongest when state and federal goals are considered. Intergovernmental agreements and joint land acquisitions give involved parties more conservation power because they can protect larger areas of land for a common purpose. They are generally legal agreements among multiple political bodies that have collaboratively agreed to a shared vision and goal that is more beneficial jointly than singly. Suggested language: “The goal of this coexistence plan is to support the conservation of wildlife in cooperation with state and federal objectives while considering the needs of the local human community.” For
example, coexistence plans for communities within the Mexican Gray Wolf Recovery Area would consider the endangered species' Recovery Plan while addressing local needs (e.g., domestic animal protection).

4.2.4. Non-lethal Methods to Protect Livestock and Wildlife

Non-lethal methods, such as the tools listed below, are more effective both fiscally and in outcomes compared to lethal methods. This section provides a broad overview of some methods (see Section 6 for additional resources on non-lethal methods).

**Fencing and fladry:** Fencing options can be permanent, mobile, electric and/or solar-powered for stationary or rotational grazing. Fladry is a string of flagging that canids, especially wolves, are afraid to cross.

**Guard animals:** Guard animals range from llamas and donkeys to various dog breeds. The appropriate guard animal depends on local context, including type of livestock, remoteness, distance from human activity, and terrain ruggedness. Guard animals require their own care and training and should be obtained from reputable sources.

**Livestock husbandry:** From livestock birth to death, good husbandry practices are the foundation for preventing attacks. Birthing should occur in safe, sheltered, electric-fenced and/or human-observed locations. Removing carcasses avoids attracting carnivores to domestic livestock.

**Range riders:** Human presence is a simple and effective method to protect livestock and prevent conflict. Range riders, usually on horseback, require little training and taking this approach creates jobs.

4.2.5. Conflict Prevention Near Human Residences

Simple solutions to avoid wild animals associating humans with food, which can lead to conflict, include not leaving any food outside, removing bird feeders and using animal-proof garbage cans. Many complaints from residents regarding “conflict” do not actually stem from conflict interactions but from concerns or worries about potential conflict that is actually unlikely, and misconceptions and intolerance of the presence
of wild animals. Communications (e.g., yard signs, social media, pamphlets) that address the low likelihood of conflict, how to mitigate potential conflict and the benefits of native species are often the best first steps to respond to residents’ complaints. Most of these methods are low cost but do require some funding to implement.

4.3. Conflict Reporting

To appropriately respond to potential conflict between humans, wildlife and/or domestic animals in a timely manner, the coexistence plan should include clear instructions for how a farmer or resident in the plan area can report concerns and receive assistance if available through the plan. Measures of conflict based on such reports can also inform plan evaluation and revision.

4.4. Funding Available and Other Assistance (if applicable)

If the coexistence plan includes a cost-share component, government funding to support non-lethal methods or direct assistance from experts, the plan should clearly articulate eligibility and requirements of the funding and/or assistance program.
4.5. Program Promotion and Outreach

Because education is one of the most important elements of wildlife conservation, the plan should include promotional and educational components. Many tools exist to educate the public and engage new participants in the plan: printed materials, websites, public presentations, tabling at conferences, farmers markets and other community events, workshops, direct emails to farmers or community groups, press releases, and social media. Inclusion of wildlife ecology in local school curriculums, installation of interpretive displays at selected open spaces, trailheads, community forums and events may be part of the education component. For example, signs might advise people to keep companion animals on leash in areas of known wolf or coyote activity.

Key areas to focus on:

1. **Why wildlife** are important including aesthetic, cultural, ecological, economic, moral, recreational and spiritual values.
2. **How non-lethal coexistence** benefits the health, safety, and welfare of the human community
3. **How unlikely conflict** between humans and wildlife are to occur
4. **How people** can get involved and support the coexistence plan

4.6. Penalties for Noncompliance

- Enforcement of the plan might include: withholding grazing permits, withholding land use changes, cease and desist orders, injunction, requiring specific performance goals be met, citations or fines by animal control or state agencies, or judicial actions (civil and criminal).

4.7. Plan Evaluation and Revision

The plan should include a process by which results will be evaluated and the plan revised as needed. The county or city should choose an appropriate timeframe for evaluation and a process by which to decide if revisions or adjustments to the plan are needed.

An evaluation form might include the following measures:

1. **Participant** (e.g., farmer implementing non-lethal methods) contact information
2. **Participant location** characteristics (e.g., residential setting, remoteness, habitat types, terrain, types and numbers of domestic animals present, crop production and practices)
3. **Non-lethal methods** used, who they are aimed to protect and for which target wildlife species (e.g., guard donkey to protect sheep from coyotes), who implemented and satisfaction with those methods

4. **Barriers** to the successful use of non-lethal methods (e.g., location acreage, isolated or near residential settings, habitat type, rugged terrain)

5. **Damages** or losses incurred during non-lethal implementation and their causes (e.g., weather, disease, attacks on livestock)

6. **Information** sources and resources used to inform non-lethal implementation

7. **Concerns** related to wildlife (e.g., perceptions that conflict is increasing or decreasing, fear or worry about the presence of a particular species)

8. **Future willingness** to implement non-lethal methods

### 4.8. Examples

Examples of existing coexistence plans include:


Other groups implementing coexistence programs include:


5. CONCLUSION

Like most worthwhile activities, creation and implementation of coexistence plans requires dedication, patience and collaboration. If coexistence plans are thoroughly informed by multiple stakeholders and the best available science, coexistence plans are likely to enjoy broad support and will withstand the test of time. A coexistence approach to wildlife management may require some stakeholders to think about wildlife and their values in new ways. The benefits are many. As communities across the American West face challenges and changes to climate, economy, and livelihoods, coexisting with wildlife will prove integral to the sustainability, perseverance and success of those communities. Thriving wildlife provide many services to people from tourism, recreation and spiritual opportunities to disease and pest control. The outdoor recreational industry alone—which includes wildlife watching and related tourism—generates 7.6 million jobs for Americans and $887 billion in consumer spending each year. For example, researchers have found that a single bobcat in Yellowstone National Park is worth about 1,000 times more alive than dead (i.e., generates $308,105 through tourism compared to a paltry $315 for pelt and license sales).

Increasingly, Western communities are adapting and rising to current challenges and reaping the rewards through diversified economies, sustainable livelihoods, healthy wildlife and clean environments. These communities provide resources, recommendations and examples others can emulate. Coexistence plans are a key step in moving local communities toward bright new futures that protect and promote healthy economies, communities, people and ecosystems.
6. ADDITIONAL RESOURCES

6.1. Non-lethal Methods - General

Randy Comeleo, Committee Chair, Benton County Agriculture and Wildlife Protection Program

Defenders of Wildlife - Livestock and wolves, a guide to non-lethal tools and methods to reduce conflicts: https://defenders.org/sites/default/files/publications/livestock_and_wolves.pdf

E Shepherd – Non-lethal livestock protection collars: http://www.eshepherd.biz


Predator Friendly: http://www.predatorfriendly.org


Farming with Carnivores Network: http://farmingwithcarnivoresnetwork.com/animal-husbandry

Project Coyote Non-Lethal Solutions to Reduce Conflicts: http://www.projectcoyote.org/programs/ranching_with_wildlife/nonlethal-solutions-reduce-conflicts/

Mountain Lion Foundation Safeguarding Livestock: http://mountainlion.org/portalprotectlivestock.asp
Bear Smart Society: http://www.bearsmart.com/work/farmers-and-ranchers/

6.2. Non-lethal Methods - Guard Animals
Ranching with Sheep - Guardian dogs and management practices to help coexist with predators: https://ranching-with-sheep.blogspot.com/search/label/livestock%20guardian%20dogs

6.3. Non-lethal Methods - Fencing
Gallagher Fencing - How electric fence works: http://gallagherelectricfencing.com/pages/fencing-faq-s
Grit Electric Fencing - Electric fencing basics: https://www.grit.com/animals/electric-fencing-basics
Ibiblio - Fence building references: https://www.ibiblio.org/farming-connection/links/fencebld.htm
Premier 1 Supplies - Fencing for sheep: https://www.premier1supplies.com/fencing.php?species id=1
Premier 1 Supplies – Choosing fencing: https://www.premier1supplies.com/sheep-guide/2012/10/before-you-buy-or-build-a-fence/
6.4. Non-lethal Methods - Poultry

Automatic Chicken Coop Door: https://www.automaticchickencoopdoor.com/

6.5. Non-lethal Methods – Scare Tactics

Foxlights - Innovative ideas to deter predators: http://www.foxights.com
Mountain Lion Foundation - Frightening devices for deterring predators: http://www.mountainlion.org/portalprotectfrighten.asp
Predator Guard - Selection of affordable predator protection devices such as scare tape: http://www.predatorguard.com

6.6. Additional Reading


Stacy Carlsen, Marin Agricultural Commissioner, manages her county’s non-lethal cost share program:

“Losses fell from 5.0 to 2.2% while program costs fell by over $50,000.

This innovative model sets a precedent for meeting a wider compass of community needs and values where both agriculture and protection of wildlife are deemed important by the community.

The success of our county model has set the trend for the rest of the nation.”
MISSION

**WildEarth Guardians** protects and restores the wildlife, wild places, wild rivers, and health of the American West.

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