

Collaborative Wildlife Migration Corridor Workshops

IDAHO, NEVADA, AND OREGON

L. STEVEN SMUTKO AND NICOLE M. GAUTIER



IN PARTNERSHIP WITH:

National Wildlife Federation

Western Landowners Alliance

Theodore Roosevelt Conservation Partnership

The Pew Charitable Trusts

Collaborative Wildlife Migration Corridor Workshops

IDAHO, NEVADA, AND OREGON

Suggested Citation: L. Steven Smutko, N. M. Gautier. 2020. *Collaborative Wildlife Migration Corridor Workshops*. University of Wyoming. Laramie, WY: Ruckelshaus Institute of Environment and Natural Resources.

Background

Mule deer, pronghorn, elk, and bighorn sheep are prominent game species of the intermountain west, and their presence and abundance are highly valued by the people who live in the region. Recent technical advances in wildlife movement tracking and analysis have increased public understanding of how these animals use seasonal migration corridors between their winter and summer ranges, resulting in heightened awareness about the importance of these routes to animal health and survival. These discoveries have also led to increased awareness of the barriers to animal movement and risks to the viability of migration corridors posed by land and resource development.

Migration routes, which have been shown in mule deer to be learned and passed down to succeeding generations of animals and followed faithfully, enable animals to exploit forage resources across time and space in response to factors such as plant phenology during spring green-up, snow accumulation at higher elevations in winter, and avoidance of predation and hunting. Corridors and the habitat within them are necessary to maintain healthy populations of numerous wildlife species. Traditional wildlife migratory routes, however, can be impeded, degraded, or eliminated by land or resource development. In addition, many migration routes cross roads and highways, and wildlife-vehicle collisions present a significant threat to human safety and wildlife populations.

Conserving migration corridors and the habitat within them, as well as providing safe passageways across major roadways, through fence lines, and between pinch points, has become an important and urgent initiative for state wildlife agencies, public land managers, and wildlife conservation organizations. At the same time, it is abundantly clear that in the patchwork of private, state, and federal landownership that characterizes western landscapes, private landowners play an invaluable role in conserving summer and winter range habitat and the wildlife migration corridors that connect them.

In June 2019, the Western Governors' Association passed a resolution urging federal land management agencies and non-governmental organizations—in coordination with state wildlife agencies—to work with private landowners and local communities, engage in dialogue with relevant partners, and identify collaborative solutions to wildlife corridor and habitat conservation across land ownerships.

In August 2019, the Ruckelshaus Institute in partnership with the National Wildlife Federation, the Western Landowners Alliance, the Theodore Roosevelt Conservation Partnership, and The Pew Charitable Trusts, convened workshops in Idaho, Oregon, and Nevada, to bring stakeholders together to discuss big game migration corridor management. The purpose of the workshops was to open a dialogue around management and conservation of wildlife migration corridors, find common ground on potential actions, and identify fruitful next steps for managing and conserving wildlife migration corridors in the West.

Participants in the three workshops included state wildlife management agencies, transportation departments, agricultural organizations, landowners, conservation nonprofits, federal land management agencies, and local elected officials among others.

“The Ruckelshaus Institute in partnership with the National Wildlife Federation, the Western Landowners Alliance, the Theodore Roosevelt Conservation Partnership, and The Pew Charitable Trusts convened workshops in Idaho, Oregon and Nevada to bring stakeholders together to discuss big game migration corridor management.”



Workshop participants identified successes, challenges, and opportunities around four central themes:

- Partnerships, intergovernmental cooperation, and local involvement
- Voluntary landowner actions
- Planning and prioritization of conservation easements
- Local, state, and federal government action

This report provides an overview of the latest efforts towards migration corridor management in each of the three states, and reports findings from the workshops. For each of the four themes identified above, the report summarizes the discussion by workshop participants about what is working in their state, as well as opportunities to improve migration corridor management and conservation.

Idaho

Idaho has based its migration corridor conservation strategy on the application of science-based approaches for improving winter range and migration corridors for mule deer, elk, and pronghorn. The state's primary focus has been on developing partnerships to positively address habitat degradation, development in priority areas and wildlife-vehicle collisions.

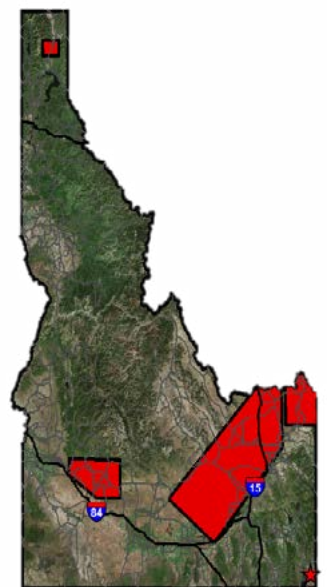
The Idaho Department of Fish and Game (IDFG) has identified five priority areas for action:

- Smoky Boise Complex
- Ashton to Montana Border
- McArthur Lake
- Rocky Point
- Market Lake to Montana Border

For each priority area, IDFG has identified specific concerns and risks to big game populations, described management efforts with cooperating organizations, outlined planned research activities, and directed funding requests and technical assistance to help address key issues.

IDFG is currently undertaking statewide habitat mapping for elk and mule deer that includes identification of winter ranges, movement routes, and stopover areas. They are also conducting research on pronghorn movements and winter range, as well as landscape connectivity issues in the McArthur Lake Priority Area.

In 2015, IDFG formalized a memorandum of understanding with the Idaho Transportation Department (ITD) to “increase public safety, promote wildlife passage, and reduce wildlife mortality due to vehicles” (Idaho State Action Plan, 2019).



Map indicating the top-five priority areas identified in the Idaho State Action Plan.

Although the partnership between IDFG and ITD has been a positive development for corridor conservation in Idaho, the agencies recently faced significant resistance from local residents on a planned wildlife overpass on US Highway 20 in Fremont County. In 2018, county residents overwhelmingly voted ‘no’ to overpasses on a county advisory vote. Elsewhere however, the agencies have successfully installed wildlife crossing structures. For example, the Rocky Point wildlife crossings, built on US Highway 30 in southeastern Idaho, have been widely regarded as successful. Pre- and post-implementation monitoring of crossing structures is currently underway.

Nevada

Nevada has been successful in funding migration research and wildlife-transportation infrastructure projects due in large part to a well-established and productive relationship between the Nevada Department of Wildlife (NDOW) and the Nevada Department of Transportation (NDOT). Using a regional approach to improving traffic safety and habitat connectivity, the state has installed nine wildlife crossings to reduce potentially dangerous wildlife-vehicle collisions. Locations of the crossings include areas of Interstate 80 between Wendover and Wells, and on US Highway 93 north of Wells in northeastern Nevada. NDOW and NDOT also hosted a “Summit on Wildlife Considerations in Transportation and Community Planning” in October 2019. The collaborative efforts between these two state agencies resulted in a Federal Highway Administration Environmental Excellence Award in 2019 for their landscape-scale approach to habitat connectivity and traffic safety in Elko County.

NDOW has been conducting migration research since the 1960’s, and historical data is helping to inform current mule deer movement studies. These are large-scale radio collaring efforts to further define and quantify migration corridors in Nevada. According to the Nevada State Action Plan, the state’s top research needs include pronghorn migration corridors, two study areas in northwest and northeast Nevada, and an analysis of existing mule deer telemetry data.

Nevada has identified three priority migrations for mule deer in the northeastern part of the state: Area 6, from Independence to the Tuscarora Mountains; Area 7 from Jarbidge to the Pequop Mountains; and Area 10, the Ruby Mountain Corridor. The Area 6 Mule Deer Working Group, a collaboration between NDOW, the BLM, Newmont and Barrick mining companies, has shown to be a successful model for ungulate habitat management. Members of the working group meet annually to discuss on-going mining projects, planned operations, and data sharing agreements.

Despite the level of research and information available, Nevada currently has no formal regulations, critical habitat designation, or protection of migration corridors for any species.



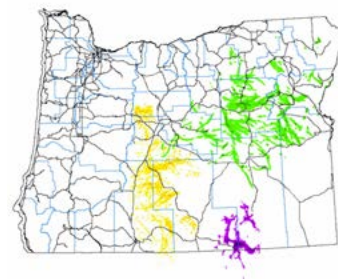
Nevada identified three top priority migrations for mule deer in northeast portion of the state.

Oregon

In 2019 the Oregon Legislature passed House Bill 2834, which directs the Oregon Department of Fish and Wildlife (ODFW) to “collect, analyze and develop the best available science and data regarding the connectivity of wildlife habitat areas.” In response, a coalition of groups in Oregon organized the Oregon Habitat Connectivity Consortium. The consortium comprises eleven entities including federal and state agencies, tribes, non-profit organizations, and academia, and is contributing to a habitat connectivity and mapping assessment project. This project is part of ODFW’s Oregon Conservation Strategy. Their approach is to “fill critical knowledge gaps by completing connectivity assessment and mapping at fine resolutions across Oregon, conducting extensive outreach to encourage a diverse group of partners to utilize and implement the results from the assessment, and to making all data and results from the analyses easy to find, view, and understand” (Wheat, 2019). The data will be added to COMPASS, an existing online mapping tool.

ODFW has been mapping corridors, stopover areas, and winter range areas in three priority areas: mule deer in southcentral Oregon and the Blue Mountains, and pronghorn in the Hart Mountain area.

In central Oregon, ODFW has partnered with the Oregon Department of Transportation (ODOT) and the US Forest Service to study wildlife passage and vehicle collisions. To date, ODOT has constructed two wildlife crossing structures on US Highway 97, a busy thoroughfare that intersects a migration corridor, resulting in a significant reduction in wildlife-vehicle collisions.



■ South-Central Mule Deer (2005-2011)

■ Hart Mountain (2015-2017)

■ Blue Mountains Mule Deer (2015-present)

Lessons from the Workshops

Partnerships, Intergovernmental Cooperation, and Local Involvement

Migration corridor management is transboundary by nature, and partnerships and cooperation are a defining characteristic of successful corridor management. Shared management objectives represent the starting point for successful partnerships, and a key ingredient is strong and fruitful relationships among partnering organizations. Here we list some common characteristics and lessons learned from successful partnerships in the three states.

- In all three states, sportsmen’s groups are taking the lead on migration-related projects. Said one Nevada participant, “We have seen tremendous success when traditional wildlife conservation organizations step up

PAM – A partnership organization in Oregon

Protect Animal Migration (PAM) is a non-profit based in Oregon with a mission to “develop community awareness and support for the urgent need for habitat connectivity for barrier-free migration for mule deer and elk.” PAM works in partnership with the Oregon Wildlife Foundation, the Oregon Hunters Association, ODOT, ODFW, and the Forest Service, to undertake a statewide outreach effort. PAM started at the community level and is now working statewide to raise awareness about migration corridors.

with volunteer labor and funding. Volunteers' personal relationships with landowners make all the difference."

- Projects benefit by capitalizing on the nimbleness of non-profits in matters of funding and timing. Partnerships also create a mechanism for leveraging the funding that makes a project viable.
- Existing collaborative groups, such as forest collaboratives, can be instrumental in moving projects forward.
- Successful corridor management projects benefit from strong relationships between state departments of transportation and state wildlife agencies. In Oregon, a framework for such a relationship has been adopted and is required by House Bill 2834 (see policy section).
- Federal-State partnerships have been instrumental in funding and implementing projects. In Oregon, the Deschutes National Forest, ODFW, ODOT, and PAM, have collaborated to designate "hot spots" where wildlife crossings are needed. Two crossings have since been constructed, and the team is working on constructing a third at this time.

"Success results from ideas or solutions that emanate from the local level instead of from the top down."

Opportunities to Enhance Partnerships, Cooperation, and Local Involvement

- **Leverage existing partnerships for sensitive species.** The sage grouse "nexus" provides a significant opportunity for migration corridor conservation in the intermountain west. Sage Grouse Initiative (SGI) partnerships present an opportunity to enhance corridor protection because sage grouse and big game habitat often overlap, and habitat management for sage grouse often shares desired outcomes with big game species. Said one Idaho participant, "There is opportunity to collaborate on how sage grouse and mule deer fit together. There are overlapping actions that benefit both; as long as we maintain communication here, we can find projects that are mutually beneficial."
- **Apply existing landowner partner programs towards migration corridor conservation.** For example, under the Partners for Fish and Wildlife Program offered by the US Fish & Wildlife Service, landowners can enter into 5- to 10-year cooperative agreements for habitat improvements, with opportunities for renewed funding. Such short-term commitments may be attractive to some landowners. Another example is the Good Neighbor Authority, which allows the U.S. Forest Service to enter into agreements with state forestry agencies. The Good Neighbor Authority program presents an opportunity to improve wildlife habitat and the health of watersheds in areas that are important to migration corridors.
- **Initiate more effective state-local partnerships.** Connections at the local level, specifically through conservation districts and weed and pest districts, present opportunities to enhance efforts toward the conservation of migratory habitat. For example, adding modifications for habitat improvement through routine maintenance would be very cost effective.
- **Let local input drive decision making.** Success results from ideas or solutions that emanate from the local level instead of from the top down. For example, involving local irrigation districts and conservation districts in corridor management projects could lead to better local involvement. Each conservation district has a locally-elected board of supervisors whose representation in corridor management conversations present an opportunity to bridge rural communities and landowners.

- **Communicate success.** Recognizing a gap in awareness around issues related to big game migration, a common theme that emerged across the three states was a need to better communicate accurate migration research and management successes between agencies and to the public.

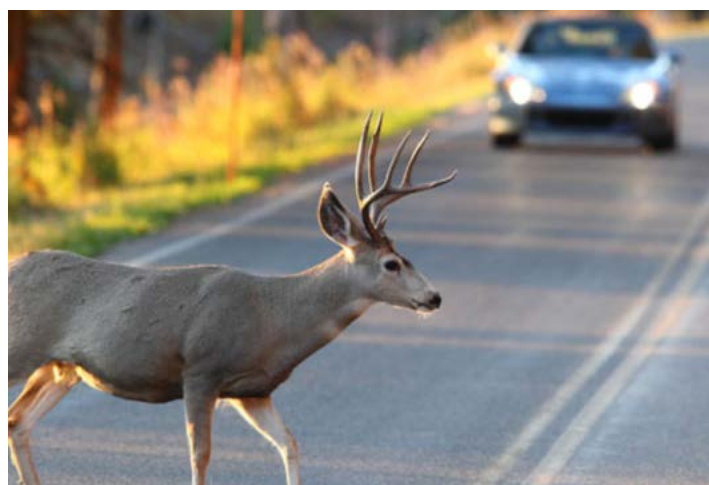
Voluntary Landowner Actions

Voluntary action refers to landowners' willing participation in migratory habitat conservation. Landowner incentive programs established through the Farm Bill are offered by federal agencies in cooperation with state and local entities, and provide support to landowners to adopt conservation practices on working agricultural lands. Examples include the Environmental Quality Incentives Program, which provides financial and technical assistance to landowners; the Conservation Stewardship Program for planning assistance on working lands; the Regional Conservation Partnership Program, which brings in partners to help fund or implement projects; and the Agricultural Conservation Easement Program, which establishes working lands conservation easements to protect agricultural uses and related conservation values of the land. Additionally, Candidate Conservation Agreements with Assurances (CCAAs), offered through the US Fish & Wildlife Service, are agreements between the agency and a landowner who may have a threatened or endangered species on their property with the objective to maintain habitat in a way that supports the species' viability and enables the landowner to maintain a sustainable, productive operation. While not available specifically for migratory species, the protection of habitat for some endangered species can benefit big game migration habitat as well. Voluntary actions require certainty and trust between the landowner and the cooperating agency or organization.

“Voluntary actions require certainty and trust between the landowner and the cooperating agency or organization.”

Opportunities to Enhance Voluntary Actions

- **Determine funding priorities locally.** Conservation district members, which in some states are defined as local working groups, can set priorities at the local and state level on how incentive program funding is spent. Through this process, local groups have the opportunity to oversee ranking criteria, and have the ability to focus funding to incentivize private landowners to consider conservation of migratory habitat.
- **Recognize landowners for their contributions to migratory habitat conservation.** As was stated in the Idaho workshop, “Wildlife is there because landowners have done something right.” This also applies to private use of public lands. For some workshop participants, the conversation about grazing on public lands should shift towards recognition that responsible public land grazing keeps lands viable.
- **Develop state-led incentive programs.** ODFW has several programs working with private landowners to enhance winter range habitat. For example, the Wildlife Habitat Conservation and Management Program (WHCMP) is “a cooperative effort involving state and local governments



and other partners to incentivize private landowners to voluntarily conserve native wildlife habitat.”

- **Promote wildlife-friendly fencing.** Outdated fences can be significant barriers to migrating animals. Workshop participants noted that landowners want easily accessible information on best practices for wildlife-friendly fencing (i.e., smooth wires, height requirements, tightening fence). In Oregon, the Oregon Hunters Association is putting together a reference resource for this information.
- **Recognize opportunities to leverage existing voluntary landowner programs to conserve migratory habitat.** Federal landowner programs and CCAA’s present an opportunity to improve corridor habitat for migrating animals. Although many of these programs cannot be applied specifically for migration corridor protection, there is often overlap in habitat for eligible species and big game.



Conservation Easements

Conservation easements are a voluntary conservation tool that limit certain uses on a property while keeping the land in private ownership. Landowners have found that easements provide a degree of flexibility while providing a permanent guarantee that the land will not be developed. Private lands play an important role in maintaining landscape connectivity, and serve as critical habitat and stopover areas for big game. Conservation easements offer landowners financial stability and an incentive to stay on the landscape, providing long-term benefits for ranching families and the wildlife species that occupy the land. Like any conservation tool, there are limitations to what easements can accomplish, and they should be targeted to areas and situations that maximize conservation goals and private landowner objectives.

Opportunities to Enhance the Effectiveness of Conservation Easements

- **Develop a strategic approach using biological and economic data to target the purchase of easements for conservation of migratory habitat.** Threat assessments are one tool for identifying high priorities such as bottlenecks, and may uncover potential conflicts with private landowners. Easements can be a valuable tool in areas with significant development pressure, but willing sellers may be difficult to find.
- **Involve local land trusts in setting conservation priorities.** Land trust organizations understand land markets and local sentiment and can provide useful information for identifying land parcels that can maximize landowner and conservation outcomes.
- **Communicate the benefits and applications of conservation easements.** Workshop participants identified a need to better communicate the intent and application of easements (i.e., what they are, what they do, how they’re implemented, what they cost).
- **Consider innovative approaches to easement design.** Easements should fit the situation and needs of both the landowner and the overall conservation objective. Said one Nevada participant, “Over time issues change, so every 30 years might be more appropriate. There are too many landowners who aren’t interested in permanent easements.”

- **Consider other tools including fee-simple acquisition, real estate donations, and land exchanges.** Opportunities for land exchanges exist in landscapes with complex ownership patterns. Other strategic agreements, such as those with landowners who agree to lay down fence every year, can complement easement agreements on a landscape.

Local, State and Federal Government Action

Migration corridor conservation has recently become a public policy goal at both the state and federal levels. In 2018, the US Secretary of the Interior issued Secretarial Order 3362, which directs federal land management agencies in 11 western states to “...enhance and improve the quality of big-game winter range and migration corridor habitat on Federal lands[...] in a way that recognizes state authority to conserve and manage big-game species and respects private property rights.”

SO 3362 put a federal spotlight on corridors, and provides funding for migration-related projects such as collaring mule deer to collect data on movement patterns. The order also mandates federal agencies to assist state agencies in meeting population goals and to develop corridor action plans.

The states are also providing policy leadership toward corridor conservation. In June 2019, the Western Governors Association passed Policy Resolution 2019-08 to “... encourage dialogue among relevant partners in the West to identify collaborative solutions to wildlife corridor and habitat conservation across land ownership.” The governors also “commend the considerable efforts already underway to increase coordination between state fish and wildlife agencies and state departments of transportation to integrate consideration of wildlife corridors and habitat connectivity into transportation infrastructure planning and development. The governors also support development of best practices to expand state agency coordination.” Below are examples of policy leadership and best practices that have emerged in Idaho, Nevada, and Oregon.

- Oregon passed House Bill 2834 in April 2019, which created a framework for ODOT and ODFW to work together. HB 2834 mandates a Wildlife Corridor Action Plan, which includes identification of corridors and priority areas for conservation. The Oregon Action Team was effective in getting this legislation passed.
- State transportation departments (Idaho Transportation Department, Oregon Department of Transportation and Nevada Department of Transportation) play a critical role

State SO 3362 Action Plans

IDAHO

Action Plan Themes:

- Priority big game populations.
- Winter range and migration issues: habitat degradation, development, transportation
- Partnership and management opportunities.

Top 5 Priority Areas:

- Smoky Boise Complex
- Ashton to Montana State Line
- McArthur Lake
- Rocky Point
- Market Lake to Montana state line

NEVADA

Nevada identified three priority migrations for mule deer in northeast Nevada:

- Area 6, Independence to Tuscarora Mountains
- Area 7, Jarbidge to Pequop Mountains
- Area 10, Ruby Mountains corridor

Top Research Needs:

- Two study areas in northwest and northeast Nevada
- Analysis of existing mule deer telemetry data
- Pronghorn migration corridors

OREGON

Oregon has three priority areas:

- South Central Oregon – Mule deer
- Blue Mountains – Mule deer
- Hart Mountain – Pronghorn

In 2020, ODFW plans to radio collar 400 mule deer and fawns, 150 Rocky Mountain elk, and 150 pronghorn.

in corridor management. This can be accomplished through infrastructure projects that promote safe passage or other wildlife–vehicle collision reduction strategies and planning.

- Success in each state was attributed to project champions in the transportation department. Said an Idaho participant, “If leadership wasn’t there together with consistent voices from local communities on need, projects wouldn’t have happened.”
- Actions such as using seasonal signage to warn of animal crossing and seasonal migration are “low hanging fruit.” In Oregon, ODOT has been putting such signs out on U.S. Highway 97, a route with a high number of wildlife–vehicle collisions, and “it really helps,” said one participant. Other techniques to alert drivers include reflectors and wildlife nighttime speed limits.

“State and federal agencies should involve county commissions in corridor management and conservation.”

Opportunities to Enhance Migration Habitat Conservation through Government Action

- **Involve county governments.** State and federal agencies should involve county commissions in corridor management and conservation. Identification and prioritization of animal movement and migration, winter and summer range, and other information can be integrated into county natural resource overlays. In addition, local government leaders can create safe forums to discuss concerns and questions related to migration corridors in communities where these projects come up.
- **Utilize state action plans to focus resources.** State wildlife action plans produced by state fish and wildlife agencies are an important planning and prioritization tool. Action plans should be updated to help focus limited resources on corridor management. There is a need to not only prioritize timing, but funding as well, and to get specific about statewide priorities.
- **Integrate corridor data into federal agency planning processes, such as BLM Resource Management Plans (RMP) and USFS Forest Plans.** The profile of corridors has risen, giving this a greater level of urgency. BLM RMPs and Forest Plans can be amended to include new information; however, agencies require significant lead time to implement projects and need to work proactively to get corridor projects into the funding stream.
- **Share datasets across disciplines.** Data ranging from numbers of wildlife–vehicle collisions to collar information serves as critical information for management decisions. As noted by one workshop participant in Oregon, “Data can better inform our decisions. There is a lot of data that exists across agencies.”



We need to put money to pool that data to help us make better informed decisions. It will be a money-saving proposition.” In Idaho, historical agreements between IDFG and ITD have resulted in thirty years of roadkill data. However, these data lack organization, and there is a need to get the data mapped from raw form to something more useful.

- **Align data collection with agency needs and priorities.** For example, ITD underscored the importance of using transportation-specific data when making the case for wildlife crossings. The agency said it is still working on ways to leverage migration as justification for funding transportation projects, and noted how linking economics, safety, and the utility of highways to populations typically helps get projects funded. If wildlife agencies can align migration data with more conventional criteria, this will help justify the need for safe animal crossing projects
- **Consider the impact of large-scale solar energy developments.** Solar energy is a growing industry in the West. Workshop participants in Oregon and Idaho in particular expressed concern over the impacts of solar fields on migration corridors as a barrier to movement, and the need for regulation around siting and reclamation of solar fields.
- **Consider the impact of road densities on federal lands.** Road density in a landscape can affect seasonal migration patterns. One possible consideration might be seasonal road closures, but consensus needs to be built around seasonal closures and travel management. Agency travel management planning presents another opportunity where migration corridor considerations can be integrated.
- **Communicate the need for migration corridor management.** Migration corridor management can be perceived as a “hook and bullet” issue, and communication is often limited to hunter and outdoor groups. Messaging around migration corridor management needs to be broadened and tailored to other constituents, including the general public. An agricultural representative in Nevada noted his constituency was having a difficult time understanding why migration is now a hot topic. To some, terms like “summer range,” “winter range,” “inventoried roadless areas,” and “WSAs,” have become associated with wilderness designation and “locking lands up.” One participant in Idaho spoke to the importance of messaging because, “If corridor management is perceived as land grab or loss of multiple use, it will not succeed.”

“One possible consideration might be seasonal closure of Forest Service roads, but consensus needs to be built around seasonal closures and travel management.”

References

- Idaho State Action Plan (V2.0) For Implementation of Department of the Interior Secretarial Order 3362: “Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors”. 2019. Idaho Dept. of Fish & Game. Accessed at <https://idfg.idaho.gov/sites/default/files/state-wildlife-action-plan.pdf>.
- Wheat, Rachel. “Oregon Connectivity Assessment and Mapping Project.” PowerPoint presentation at the Oregon Migration Corridor Workshop, Bend, OR, August 2019.

For More Information

- Carmel, Margaret. "Boise approves funding towards wildlife bridge on Hwy 21." Idaho Press, February 2019. https://www.idahopress.com/news/local/boise-approves-funding-toward-wildlife-bridge-on-hwy/article_13e8135a-3a2a-5192-9205-29db496df7f5.html
- Copeland, H. E., H. Sawyer, K. L. Monteith, D. E. Naugle, A. Pocewicz, N. Graf, and M. J. Kauffman. 2014. Conserving migratory mule deer through the umbrella of sage-grouse. *Ecosphere* 5(9):117. <http://dx.doi.org/10.1890/ES14-00186.1>
- Herring, Hal. "Restoring Mule Deer Habitat, One Swing at a Time." *Field & Stream*, November 2016. <https://www.fieldandstream.com/restoring-mule-deer-habitat-one-swing-at-time/>
- Hottle, Dan. "Nevada group seeks balance for 'Mother Sage.'" United States Fish and Wildlife Service, Aug. 2017. https://www.fws.gov/cno/newsroom/featured/2017/roger_group/
- Idaho Department of Fish and Game. "State Wildlife Action Plan." 2017. <https://idfg.idaho.gov/swap>
- Merkle, Jerod A., Hall Sawyer, K.L. Monteith, S. P. Dwinell, G. L. Fralick, M. J. Kauffman. 2019. Spatial memory shapes migration and its benefits: evidence from a large herbivore. *Ecology Letters* 22:1797-1805. <https://doi.org/10.1111/ele.13362>
- Nevada Department of Wildlife. "Conservation." 2019. http://www.ndow.org/Nevada_Wildlife/Conservation/
- National Fish and Wildlife Foundation. "Rocky Mountain Rangelands." 2019. <https://www.nfwf.org/westernmigrations/Pages/home.aspx>
- Nevada Collaborative Conservation Network. 2019. <http://www.nvccn.org/about/>
- The Nature Conservancy. "Conserving Sagebrush." 2019. <https://www.nature.org/en-us/about-us/where-we-work/united-states/nevada/programs/conserving-sagebrush-ecosystems/>
- Oregon Legislative Information. House Bill 2834. April 2019. <https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/HB2834/Enrolled>
- Oregon Conservation Strategy. "Strategy Spotlight: U.S. 97 Wildlife Crossing." 2019. <http://oregonconservationstrategy.org/success-story/us-97-wildlife-crossing/>
- Oregon Department of Fish and Wildlife. "Conservation." 2019. <https://www.dfw.state.or.us/conservationstrategy/index.asp>
- State of Nevada Sagebrush Ecosystem Program. 2019. <http://sagebrusheco.nv.gov/About/About/>
- Western Governors Association. Policy Resolution 2019-08, Wildlife Migration Corridors and Habitat. June 2019. http://westgov.org/images/files/WGA_PR_2019-08_Wildlife_Migration_Corridors_and_Habitat.pdf
- United States Department of the Interior. Secretarial Order 3362, ORDER NO. 3362, Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors. February 2018. https://www.doi.gov/sites/doi.gov/files/uploads/so_3362_migration.pdf

