



NFWF

Great Migrations and Crucial Corridors Initiative

Focal Linkage: Cabinet-Yaak Wildlife Corridors

A 10-year Business Plan for the Conservation of the
Cabinet-Yaak Wildlife Corridors



November 2012
(updated from March 2010 draft)

What is a business plan?

A business plan serves two broad, primary functions. First, it provides specific information to those (e.g., prospective investors) not familiar with the proposed or existing business, including its goals, the management strategy and financial and other resources necessary to attain those goals. Second, a business plan provides internal guidance to those who are active in the operation of the business, allowing all individuals to understand the direction and path of the business. The plan helps keep the business from drifting away from its goals and key actions through careful articulation of a strategy.

In the context of the National Fish and Wildlife Foundation's conservation efforts, business plans represent the strategies necessary to meet the conservation goals of the Keystone Initiative. Each business plan emphasizes the type(s) and magnitude(s) of the benefits that will be realized through the Initiative, the monetary costs involved, and the potential obstacles (risks) to achieving those gains. Each of the Foundation's business plans has three core elements:

Conservation Outcomes: A concrete description of the outcomes to which the Foundation and grantees will hold ourselves accountable.

Implementation Plan with Strategic Priorities and Performance Measures: A description of the specific strategies that are needed to achieve our conservation outcomes and quantifiable benchmarks by which we will measure success and make it possible to adaptively manage in the face of unexpected or unintended outcomes.

Funding and Resource Needs: An analysis of the financial, human, and organizational resources needed to carry out these strategies.

The strategies and activities discussed in this plan do not represent solely the Foundation's view of the actions necessary to achieve the identified conservation goals. Rather, it reflects the consensus or majority view of the many federal, state, academic or organization experts that we consulted with during plan development.

In developing this business plan, the Foundation acknowledges other planned conservation activities that may indirectly benefit keystone targets. This business plan is not meant to duplicate ongoing efforts but, rather, to invest in areas where management, conservation, or funding gaps might exist in those broader conservation efforts. Hence, the aim of the business plan is to support the beneficial impacts brought about by the larger conservation community.

EXECUTIVE SUMMARY

Assuring the future of healthy wildlife populations in the Northern Rockies of the US will require providing wildlife movement opportunities between the large blocks of public land in this area. Human-caused mortality and habitat loss are the primary threats to long-term population viability of wide-ranging species such as grizzly bear. Most of the public lands in the Northern Rockies are focused on higher elevation areas, and the connections or linkage areas between publicly-owned habitats are usually in low elevation valley bottoms. Most of these low elevation areas are privately owned, and many of them have highways running through them. The combination of private land ownership, usually associated with home development or agricultural production, combined with high-speed roads, subjects wildlife to increased mortality as they try to move through these linkage areas. Long-term landscape viability for most wildlife species will increase if they have the opportunity to move through such low elevation areas and cross highways for purposes of dispersal, access to necessary habitats, and in response to climate-change driven changes in food distribution.

The North American range of grizzly bears (*Ursus arctos*, also called brown bears) has contracted in the past century and a half because of human-caused mortality, habitat loss, and population fragmentation. In the conterminous US, 98% of their range has been lost. Whereas bears in the Yellowstone Ecosystem have recovered extremely well, the smaller Cabinet-Yaak population, which is the focus of this business plan, remains tenuous (Fig. 1). Assuring the further recovery of the grizzly bear depends upon success in building healthy populations in the Cabinet-Yaak, which is in turn dependent on the willingness of local communities to tolerate and adapt to the bears' presence, protection of key parcels in movement corridors, and direct management of bears to speed population growth rates.

This business plan maps out a 10-year effort intended to improve the viability of grizzly populations in Montana, Idaho and nearby portions of Canada. Implementing this plan will also improve the viability of populations of fisher, wolverine and Canada lynx in Montana and Idaho and preserve critical movement opportunities for elk, mule deer, bighorn sheep, caribou, and moose. This business plan will guide every aspect of the Foundation's anticipated \$13.7 million in grant-making associated with the Cabinet-Yaak Wildlife Corridors and grizzly bear conservation.

Our resources will be focused on the following strategies:

- Improving the opportunity for wildlife movement within and between the large blocks of public and provincial lands in the Northern Rockies.
- Building public support and understanding among the residents of mountain valleys in the Rockies about the benefits of healthy, interconnected populations of wildlife including bears and thereby reducing human/wildlife conflicts and human-caused wildlife mortality.
- Increasing the grizzly populations in the Cabinet-Yaak ecosystem thereby fostering healthy stepping-stone populations southward.

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Grizzly bear trying to cross a highway in the Northern Rockies. Photo: Scott Tomson

Conservation Need

Low elevation habitats along valley bottoms and rivers support most of the existing and likely future growth in human populations in the Northern Rockies. These areas are typically privately owned and often are bisected by highways. Habitat loss from private land development in valley bottoms is a major threat facing wide-ranging populations of many large mammals that may limit successful movement and dispersal. These ‘fracture zones’ disrupt the natural movement of Canada lynx, wolverine, grizzly bear and fisher, and large mammals such as elk, bighorn sheep, mule deer, and moose. Such land development has three main impacts: 1) direct habitat loss; 2) increased risk of mortality by increasing the frequency and lethality of contact between people wildlife; and 3) displacement and avoidance of developed areas by wildlife. Especially for grizzly bears, as more people occupy the landscape, their associated activities and attractants like garbage, pet food, and bird seed can lure bears into conflict situations or make wary bears avoid valley bottoms entirely.

The grizzly bear once roamed most of the entire western United States and south into central Mexico, with a population estimated at 50,000 bears. Today, approximately 1,500 bears remain in five separate areas in Wyoming, Montana, Idaho, and Washington (the bear remains numerous in Canada and Alaska). At present, the region spanning the Canada-US border represents the southern limit of the contiguous North American range. This region is currently affected by fragmentation, which can create small isolates of grizzly bears in patches that cover hundreds of square miles because the species occurs at low densities. Whereas bear population in the Yellowstone Ecosystem have recovered extremely well, the smaller trans-border populations of northwest Montana and north-central Idaho – the Cabinet-Yaak, which are the focus of this business plan, remain tenuous (Table 1). At present, current movement rates do not appear sufficient to consider the subpopulations as one inter-breeding unit (Proctor et al. 2012) and long-term persistence of these small populations is likely reliant upon their reconnection to larger populations.

Recovery Zone	Estimated Population Size	Trend (% change annually)
Greater Yellowstone Area	582 ^a	+4, 7% ^b
Northern Continental Divide	765 ^c	+3% ^d
Cabinet-Yaak	42 ^e	-3.8% ^e
Selkirk	80 ^f	+1.9% ^g
North Cascades	<20	unknown
Bitterroot	0	n/a

^a Haroldson 2010, Interagency Grizzly Bear Study Team annual report

^b Harris et al. 2006

^c Kendall et al. 2009

^d Mace and Roberts 2011

^e Kasworm et al. 2010

^f Proctor et al. in press; Wakkinen 2010

^g Wakkinen and Kasworm 2004

Table 1. Estimated grizzly bear population size and population growth rate by recovery zone (from FWS 2011 5-year assessment report).

The primary threats to landscape connectivity for wildlife within the Cabinet-Yaak are:

- Continued private land subdivision and development and deficiencies in land use planning, particularly on critical valley-bottom habitats.
- Lack of consensus around the most important linkage areas in which action is necessary to sustain the highest value wildlife corridors for large mammals and predators in the region.
- Transportation systems that create low permeability for wildlife movement due to increased highway traffic speed and volume (or railroad usage).
- Human-wildlife conflict, especially with grizzly bears because many communities are still learning how to live with and adapt to the presence grizzly bears, resulting in unsustainable levels of human-caused mortality in many areas.
- Low grizzly numbers in the 'stepping-stone' grizzly population area of the Cabinet Mountains.

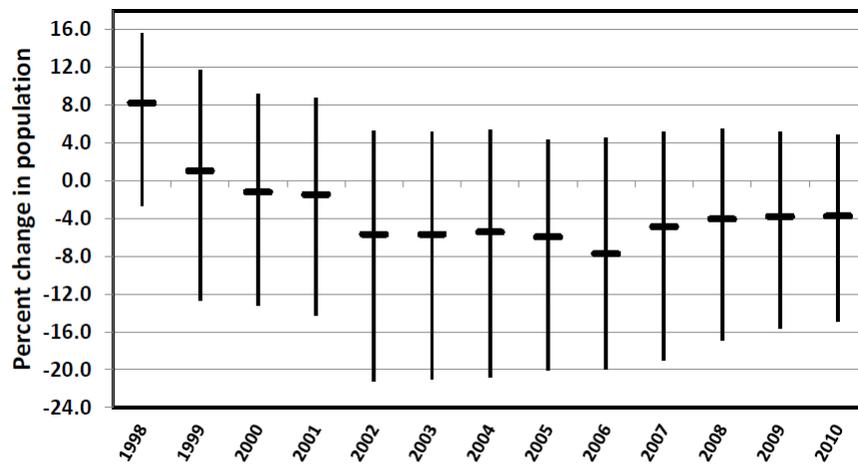


Fig. 1. Percent change in population of Cabinet-Yaak grizzly bears from 1998 to 2010. This shows that the population has been in decline since 2000 and that a strategic recovery plan is needed.

Conservation Outcomes

This plan focuses on wildlife corridor priorities where action is needed to ensure that wide-ranging species can continue seasonal migrations and dispersal events that enhance population viability and ensure the long-term survival of the northern Rockies megafauna. Connections between these areas will also increase population and habitat resilience by allowing animals to respond to changes in vegetation, food distribution, and seasonal habitats resulting from climate change. For grizzly bears in particular, the long-term viability of the Cabinet-Yaak sub-populations depends upon connectivity. The 10-year outcome expected for this plan is to conserve or enhance permeability for grizzly bear and other wildlife in crucial linkage areas within the Cabinet-Yaak recovery area (Fig. 2). This should allow the target of 6 females with cubs to be reached and a sustainable population of greater than 50 individuals to be realized.

Investments here could potentially allow a population of 280 grizzly bears to someday occupy and thrive in the Bitterroot ecosystem. Securing a healthy and stable population of grizzly bears in the Bitterroot represents approximately 14% of the U.S. goal for bear population recovery in the 4 states of MT, WY, ID, and WA. The Bitterroot ecosystem is one of the 6 grizzly bear ecosystems identified in the Grizzly Bear Recovery Plan and it is currently unoccupied. This initiative will allow grizzly bears to move into this area from adjacent occupied habitats in the Purcell, Selkirk, Cabinet-Yaak areas. The eventual re-occupancy of the Bitterroot ecosystem to a population of 280 bears would represent an increase of 20% above the lower 48 states 2009 population of approximately 1425 grizzly bears.

The following performance outcomes are expected from this plan:

- Identification of movement opportunity areas in each of the mountain valleys identified in this proposal in the next 10 years.
- Securing at least one complete movement route in easement and/or acquisition in at least 50% of these movement opportunity areas identified in the next 10 years.
- Improved connectivity documented with increased sightings and evidence of key wildlife species including grizzly bears dispersing into areas outside current range.
- Reduction of exurban development in at least 50% of the movement opportunity areas identified in the next 10 years, compared to the counterfactual. Monitoring will provide reporting on land subdivisions and easement and land conservation acquisitions within each movement opportunity area and in comparative areas within the same county.

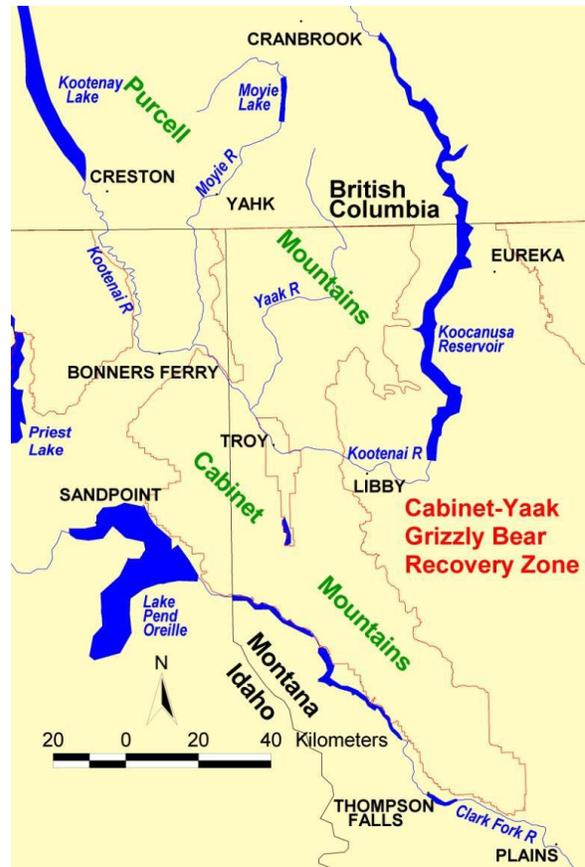


Figure 2. Map of the Cabinet-Yaak Grizzly Bear Recovery Zone (courtesy of the US Fish and Wildlife Service 2009 Cabinet Yaak Report).

- Movement of grizzly bears and other sensitive species between the large blocks of public lands as documented by surveys and monitoring of GPS-collared animals in the next 10 years.
- Movement of grizzly bears and other sensitive species within at least 50% of the movement opportunity areas identified as documented by surveys and monitoring of GPS-collared animals.
- Placement of at least 10 sub-adult female grizzlies into the Cabinet Mountains over the next 10 years. Achieve at least 15% reduction of known, human-caused mortality in the Cabinet Mountains over the next 10 years.
- Reduced numbers of bear/human conflicts measured as the number of conflicts per movement opportunity area and within the county measured per capita. Reduced mortality rates related to management removals due to bear/human conflicts. Increased distribution and use of bear-resistant garbage containers by private residents within and adjacent to movement opportunity areas.

Implementation Plan

Experts have indicated that the following strategies need to be implemented to address the threats to wildlife movement in Northern Montana and Idaho and to the grizzly bear in the 2600 square mile Cabinet-Yaak ecosystem recovery zone and surrounding areas of the Northern Continental Divide and Purcell Mountains. This plan is focused on actions that should take place over the next 10 years. This section includes both broader descriptions of Threats and Strategies and additional detail on the actions needed within specific Priority Linkage Areas.

Addressing Threat 1 – Loss of Wildlife Movement Areas

Goal: Maintain Permeability of Highest Priority Linkage Areas

Strategy 1 Identify the most important existing corridors in priority areas

The Linkage Areas (Fig. 4) are the highest priority areas identified through a ranking process through which biologists from all relevant state and federal agencies and many non-government organizations provided input on important linkage areas and the overall value of and threat to those areas for grizzly, elk, Canada lynx, big horn sheep, fisher, moose, and wolverine. Refined analyses are needed in some Linkage Areas to identify the best opportunities for movement within these broader areas, specific property ownerships, landowner contacts, and conservation outcomes developed specific to each important area within a Linkage Area.

Strategy 2 Prevent Development on Key Corridor Lands

Prioritization. Figure 3 and the Linkage Area summaries below show the most important areas for land protection in the geography covered by this Business Plan. In a number of these areas, the acreage of land needed to secure future opportunities for wildlife movement is relatively small due to existing public and protected lands and the configuration of local geography.

Local Planning. Local governments and landowners typically lack information about the needs of wildlife moving across the landscape and about how land development and land use practices may increase human-wildlife conflict that creates barriers to animal movement. Many developments are

planned and are partially or mostly complete before fish and wildlife information is considered in the process. The following efforts are our highest priority:

1. The Montana Department of Fish Wildlife and Parks has completed a decision support system that makes wildlife information easily available and there have been additional efforts at education regarding domestic waste management. A sustained effort is needed to make counties and landowners aware of this information and to help institutionalize it in local planning decisions; county-specific efforts need to be focused on the areas with the greatest interest in adopting wildlife corridor considerations in their planning and that are most critical to wildlife populations. Investments are needed to create partnerships with local residents and county governments in each priority mountain valley to build local support and understanding about the issue of wildlife movement areas in key locations.
2. In areas where development pressure is particularly intense, knowledge of specific localized wildlife movement corridors may be used to support incorporated landscape design standards like clustering and setbacks.

STATUS: *This program supported Montana Department of Fish, Wildlife and Parks in their comprehensive effort to map connectivity for a set of focal species (Crucial Areas and Connectivity Assessment and Training). NFWF has funded the University of Montana to do outreach in the Swan Valley; Montana Fish, Wildlife and Parks to have a grizzly specialist do outreach throughout Western Montana, including creating a mandatory food storage program on the Kootenai National Forest; in the Blackfoot watershed, we have supported outgoing outreach and conflict avoidance efforts.*

Protection. Significant efforts to protect corridors and movement areas are critical to this resiliency and the viability of the target populations. Although the Foundation can provide only a fraction of the budget needed to secure Linkage Areas, we will allocate up to \$4 million over 5 years toward the high priority projects. In addition, if Congress, agencies or other sources provide the Foundation with additional revenue, we will seek to increase our contribution to land protection in this area. In particular, we will seek to support projects in highest priority (Fig. 3) linkage areas that buffer core habitat from development and maintain connectivity across the landscape.

STATUS: *As of 2012, NFWF has helped protect 57,264 acres of land through long-term easements by as well as to help restore a key 45 acre parcel of land in a priority corridor. Projects were located in the Hwy. 2 (Kootenai Valley) and Hwy. 200 (Clark Fork Valley) corridors, on 11,041 acres of the Sun Ranch, at McArthur Lake, and Troy Creek.*

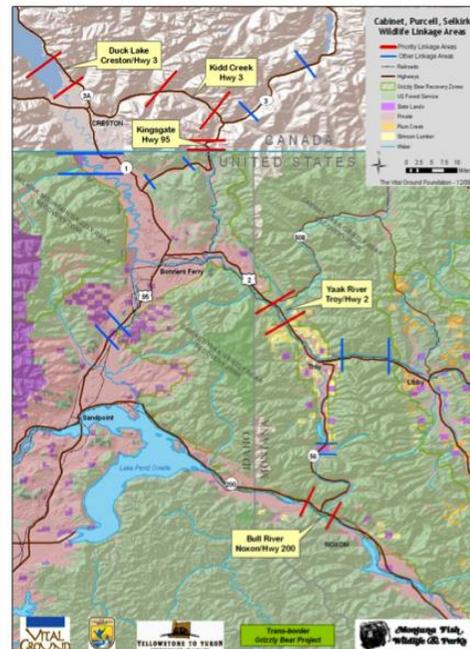


Fig. 3. Priority corridors for grizzly-focused land conservation.

Strategy 3 Reduce Highway and Railroad Impacts to Wildlife Movement

The negative effects of transportation corridors have been documented for numerous wildlife species. For example, in the trans-border area of the northern USA and southern interior of British Columbia, extensive genetic and population fragmentation exists in grizzly bear populations that correspond to settled mountain valleys and major highways (Proctor et al. 2012). As traffic volumes and speeds increase with increasing human populations in the Northern Rockies, the fragmentation impacts of highways become even more pronounced.

The following road kill/linkage hotspots are among the most important locations in which work is needed to reduce wildlife-transportation conflicts:

- Highway 2 in Lost Trail-Kenelty,
- Highway 2 at McArthur Lake
- Interstate 90 in Superior (3 locations),
- Highway 83 in Swan Valley (2 locations),
- Highway 83 in Blackfoot-Clearwater (4 locations),
- Highway 200 in Blackfoot-Clearwater (2 locations), and
- Highway 12 in Petty Creek.

The Highway Mortality and Linkage Assessment (Williamson, 2009) can be used to further prioritize regional transportation mitigation efforts for wildlife. Because road kill collection is not standardized within or among the agencies, however, highway mitigation for wildlife may be warranted in specific locations not identified by this assessment. Mitigation along highways is most effective where the adjacent habitat is also protected from development and/or restored to a functional state.

STATUS: *As of 2012, NFWF has engaged in activities to better understand and reduce highways impacts by funding an assessment of highway mitigation opportunities in Boundary County, ID; mitigation at McArthur Lake; and a project that will work with county planners throughout the program region on road planning and design to protect wildlife corridors.*

Specific Strategies for Priority Linkage Areas

Implementation of the following strategies and actions is critical to the success of this Business Plan. Proposal should reference which of the linkage areas the proposed scope of work will influence.

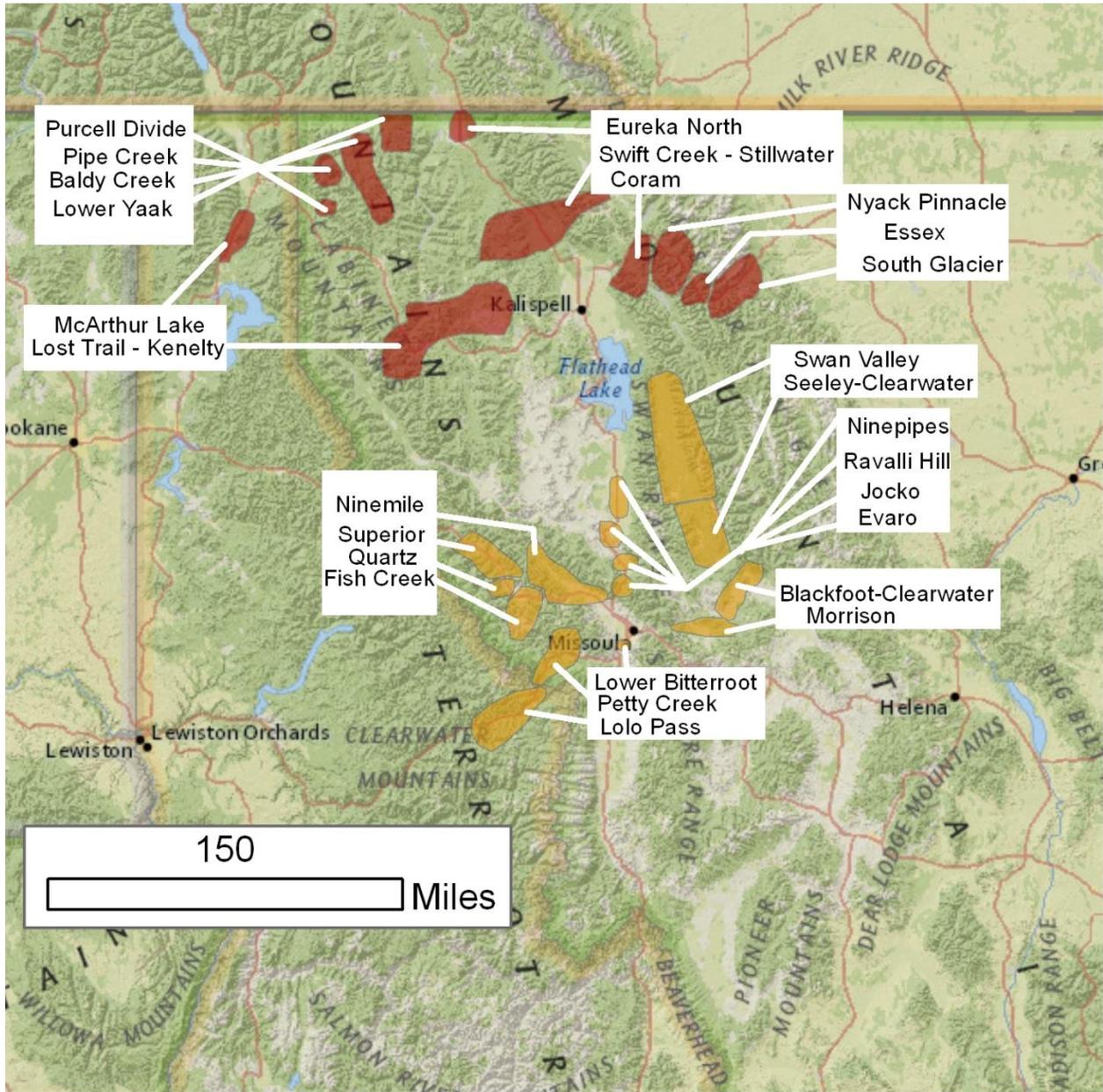


Fig. 4. Montana and Idaho lands that are the focus on National Fish and Wildlife Foundation investments in the Cabinet-Yaak. Red polygons are wildlife movement areas or corridors that experts identified as having very high threats and opportunities; orange polygons are wildlife movement areas or corridors that experts identified as having high threats and opportunities.

Swift Creek – Stillwater: The Swift Creek – Stillwater linkage (Fig. 5) connects the western edge of Glacier National Park and the Salish Mountains in northwestern Montana. Regionally, the linkage enables wildlife movement between the Northern Continental Divide Ecosystem and the Cabinet-Yaak Ecosystem.

- *Protect key state/private lands through acquisition and easement.* Target the Plum Creek property, which is surrounded by the Swift Creek State Forest. Protect parcels that adjoin or buffer existing easements and/or will help buffer the Flathead National Forest from development centers like Whitefish, Olney, Stryker, Trego and Fortine.
- *Monitor wildlife mortality* Support studies to identify wildlife mortality along Highway 93 and the railroad. A Habitat Conservation Plan for the Glacier region will require Burlington Northern Santa Fe railroad to mitigate wildlife mortality, but identifying hotspots along the railroad is key to success. Since the highway and railroad run parallel, mitigation projects that address wildlife crossing across both transportation routes will have better long term efficacy than projects that address one or the other.
- *Secure easements along transportation routes* Approach private landowners along the North Fork road – individuals in this area have expressed interest in land conservation in the past. Target lands that overlap areas where wildlife is known to cross public roads, highways, and railroads to add long-term value to mitigation projects.
- *Limit improvements to public roads that will attract development and increase vehicle speeds* Engage in public meetings, garner support to minimize upgrades and maintain the rural character of communities along public roads. The North Fork road is an important near-term target given proposed paving by the Federal Highways Administration.

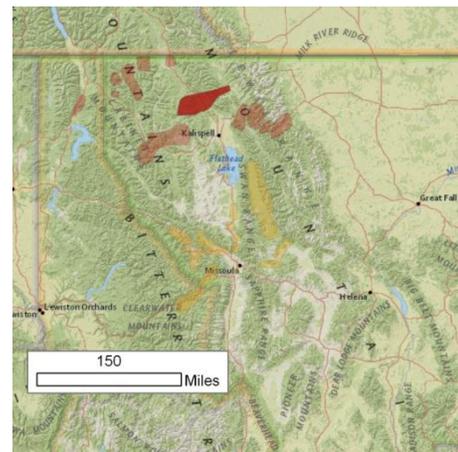


Fig. 5. The Swift Creek-Stillwater linkage pictured in bright red

Lost Trail – Kenelty: The Lost Trail (Kenelty) linkage (Fig. 6) provides connectivity between the Salish and Cabinet Mountain ranges. This is one of the highest ranked linkages in the Cabinet-Purcell Priority Linkage Assessment.

- *Encourage additional mitigation between mile-markers 60.2 and 61.9 on Hwy 2.* Install signage and/or fencing along this segment of the highway. The landscape does not lend itself well to crossing structures, but additional mitigation is necessary to mitigate wildlife mortality and improve human safety.
- *Decommission and restore forest roads* Decommission and restore public roads within the Kootenai National Forest to meet grizzly bear habitat standards. The Kootenai NF is required to meet road density standards that comply with grizzly bear habitat standards, but decommissions accompanied by restoration are more effective at enhancing wildlife connectivity.

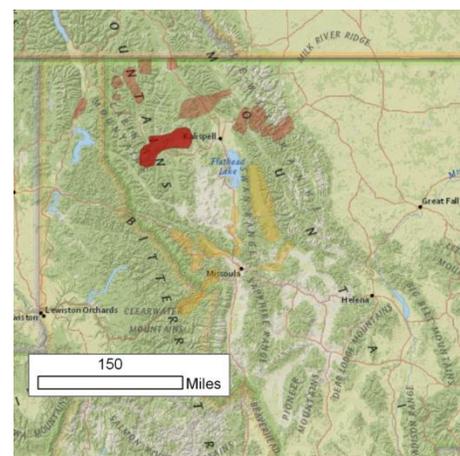


Fig. 6. The Lost Trail – Kenelty linkage pictured in bright red

- Expand on existing Plum Creek easements if the seller is willing and funding support can be found. Target lands west of Jennings and surrounding Happys Inn.

STATUS: *NFWF expects to make an award to Y2Y in 2012 to help the Kootenai NF decommission roads.*

Nyack Pinnacle/Essex/South Glacier: Situated along the southern extent of Glacier National Park, the Nyack Pinnacle, Essex and South Glacier linkages (Fig. 7) support wildlife movement between the Park and the Bob Marshall Wilderness.

- *Ensure appropriate mitigation commitments in the Habitat Conservation Plan* A Habitat Conservation Plan is being developed by the US Fish and Wildlife Service and Burlington Northern Santa Fe railway (BNSF). BNSF commitments should be sufficient mitigation to prevent additional grizzly bear mortality along the railroad. Mitigation activities could include resolving grain spillage, crossing structures, fencing or support for studies that monitor wildlife crossings and mortality rates.
- *Support research to identify wildlife mortality hotspots along both Highway 2 and the railroad* Support research that identifies specific wildlife crossings along the highway and railroad to facilitate future mitigation activities.
- *Support analyses of mitigation opportunities such as crossing structures at key locations along transportation routes* Build on the above research by conducting analyses that identify appropriate mitigation activities at specific locations along the highway and railroad. Incorporate cost-benefit analyses to determine economic feasibility. Opportunities to mitigate both the railroad and highway simultaneously will have greater long-term effectiveness than mitigating one or the other.
- *Conserve private lands through easement* Engage private landowners and take advantage of easement opportunities in these corridors. Target lands that overlap movement corridors for wildlife across the highway and railroad.
- *Support education and outreach to improve knowledge among local communities about living with wildlife* Support outreach and education efforts such as the Great Northern Environmental Stewardship Area (GNESA), designed to improve local knowledge and about properly managing attractants. Implement strategies such as fencing transfer stations, purchasing of bear-safe community garbage containers, and/or instituting bear-safe garbage bin loaner programs for private citizens.

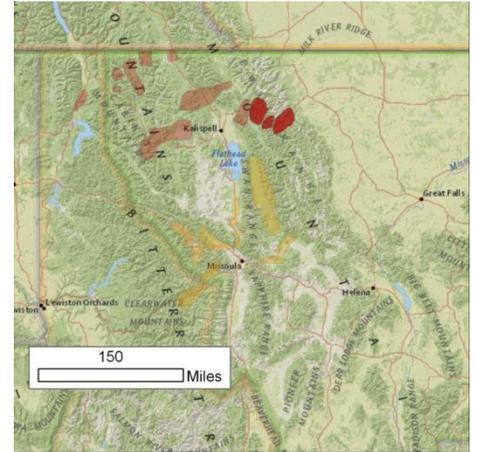


Fig. 7. The Nyack Pinnacle, Essex, and South Glacier linkages pictured in bright red

STATUS: *NFWF's support for the outreach coordinator is helping communities live with wildlife.*

Coram: Coram (Fig. 8) provides connection between Glacier National Park, the Bob Marshall Wilderness and the Flathead National Forest. Highway 2 and the BNSF railroad create a fracture zone for wildlife moving north-south between Glacier National Park, the Great Bear Wilderness, Flathead National Forest, and the Bob Marshall Wilderness. Highway 206 is one of several highways impeding east-west wildlife movement between the Flathead National Forest and the Bob Marshall Wilderness. These routes are a source of mortality for wildlife. Grain spills from railroad cars attract bears and other wildlife to the tracks where they are frequently hit by oncoming trains.

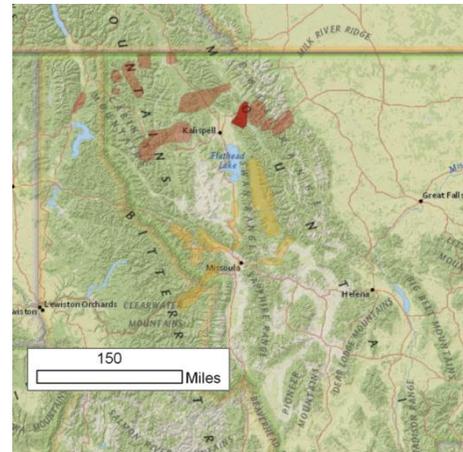


Fig. 8. The Coram linkage pictured in bright red

- *Ensure appropriate mitigation commitments in the Habitat Conservation Plan.* As described above for Nyack Pinnacle/Essex and South Glacier linkage areas, the Coram linkage area will benefit in the mitigation agreed to in the Burlington Northern Santa Fe Railroad plan is sufficient and implemented well.
- *Acquire and/or secure easements on private lands* Target easements to buffer areas of intense development. One key area to focus attention is the section of land south of West Glacier and west of Coram. Targeted easements in this area will go a long way toward securing wildlife connectivity in the Flathead.
- *Support land use planning* Support efforts to incorporate land use planning into community development plans.
- *Improve local knowledge about living with wildlife* Increase local awareness of wildlife attractants and proper food and garbage storage practices. Improve community tolerance for wildlife. Both Montana Fish, Wildlife and Parks and the U.S. Fish and Wildlife Service have ongoing collaborative programs to provide communities with bear-safe garbage containers and fencing to protect transfer stations that need continued support.
- *Support outreach and education efforts* designed to improve local knowledge and about properly managing attractants and protecting livestock from wildlife predation. Implement strategies such as fencing around transfer stations, purchase of bear-safe garbage containers, and/or bear-safe garbage bin loaner programs for private citizens to address garbage problems. Where predation levels warrant it, encourage programs to protect livestock. These may include protective dogs, range riders or compensation.

STATUS: *NFWF's support for the outreach coordinator is helping communities live with wildlife.*

Lower Yaak and Purcell Divide: The Lower Yaak linkage (Fig. 9) falls within the Grizzly Bear Recovery Zone and is an important linkage spanning the Yaak River within the Cabinet-Yaak Ecosystem. The Purcell Divide is situated in the heart of the Purcell Mountains and the Yaak River Valley at the Canadian border. Regionally, this linkage provides important north-south connection across the Canadian-U.S. border within the Cabinet-Yaak Ecosystem. Although this linkage has few identified threats to connectivity, the high value of the habitat to grizzly bear, caribou and lynx make it an important place to monitor for conservation opportunities.

- *Engage the Forest Highways planning process*
Encourage analysis of wildlife crossing and collision hotspots as part of any Forest Highways projects. Incorporate wildlife values into Forest Highways plans for road improvement.

STATUS: *NFWF will support Y2Y to engage in the Forest Highways planning process in this region.*

Pipe Creek & Baldy Creek: Both Pipe Creek and Baldy Creek are high priority linkages (Fig. 10) located within the Yaak River drainage. Both linkages provide connection between key roadless areas within the Yaak River valley. The valley contains high quality wildlife habitat, particularly for grizzlies in early spring. Subdivision and development along the Yaak River is the most significant threat in these linkages.

- *Acquire and/or secure easements on private lands*
Large private properties adjoin the Yaak River and the national forest. The Forest Service connectivity plan should be used to help prioritize parcels for easement or acquisition. In particular, the Plum Creek lands around the Pipe Creek Road were identified by the Montana Legacy Project as ‘option lands’. These option lands remain unprotected and it seems unlikely that the Legacy Project will pursue acquisition without additional support which could come in part from the Foundation.
- *Monitor transportation activities along public roads*
Proposed road improvement projects should be evaluated for their potential wildlife impacts and wildlife-friendly design elements should be incorporated into proposed plans.
- Support outreach and education efforts designed to improve local knowledge about managing wildlife attractants. Strategies such as fencing transfer stations, purchasing bear-safe community garbage containers, and/or instituting bear-safe garbage bin loaner programs for private citizens have proven effective in many areas.

STATUS: *NFWF has supported both Vital Ground and TPL with land protection efforts in these linkages.*

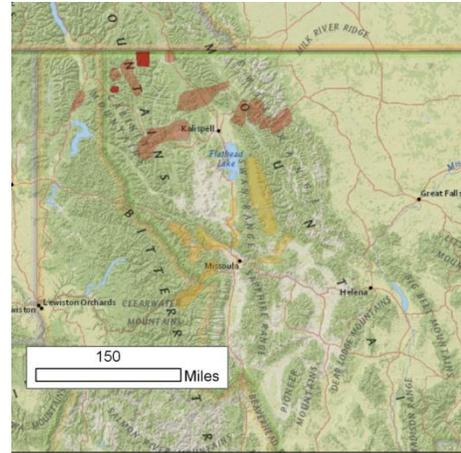


Fig. 9. The Lower Yaak and Purcell Divide linkages pictured in bright red

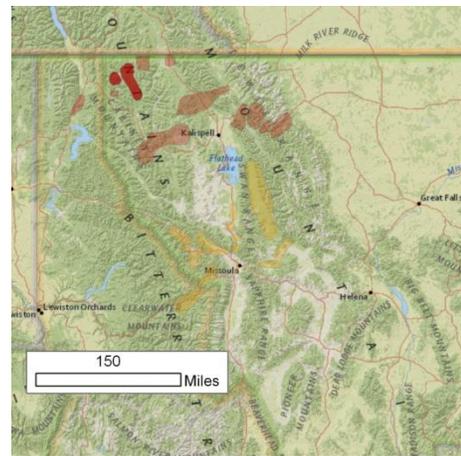


Fig. 10. The Pipe Creek and Baldy Creek linkages pictured in bright red

Eureka North: Eureka North (Fig. 11) is a high priority linkage situated just east of Lake Kooconusa on the Canadian border. Eureka North provides connection across the Canadian border between the Purcell and Whitefish ranges as well as east-west between segments of the Kootenai National Forest. This linkage consists primarily of highly subdivided private land with few easements.

- *Acquire and/or secure easements on private lands*
Target large properties that abut the national forest in areas with the greatest potential to facilitate connectivity (i.e. low densities of buildings, intact woodland, etc.). The area south of Eureka has relatively fewer private lands, potentially offering a better opportunity to protect a wildlife corridor with fewer targeted easements than areas to the north where development and private land holdings are more extensive.
- *Improve local knowledge about living with wildlife*

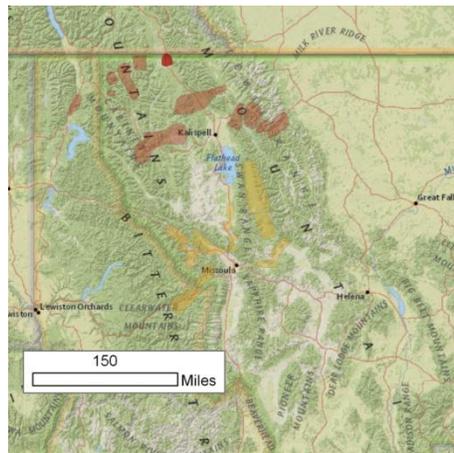


Fig. 11. The Eureka North linkage pictured in bright red

McArthur Lake: McArthur Lake (Fig. 12) is the narrowest, most viable east-west corridor linking the Selkirks and Cabinets. East-West linkages across private lands are at a premium in connecting large blocks of wildlife habitat on public lands that generally run north-south along the Northern Rockies. McArthur Lake is the best east-west linkage zone in the Kootenai River Valley, extending more than 100 miles from McArthur Lake in the south to the northern boundary of Kootenay Lake in British Columbia. Kootenay Lake creates an impassable barrier to east-west migration for 65 miles. The Nature Conservancy and others have made significant investments in this landscape. The State

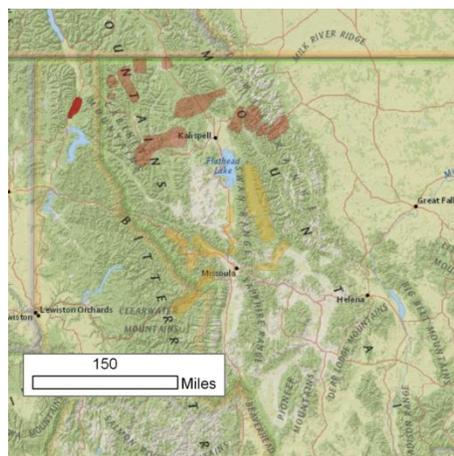


Fig. 12. The McArthur Lake linkage pictured in bright red

Wildlife Action Plan recognizes McArthur Lake as a priority area, and there is a state Wildlife Management Area surrounding McArthur Lake itself. Traffic on US Highway 95 and two major railroad lines causes high rates of mortality for wildlife crossing this linkage area. The Idaho Transportation Department (ITD) has identified McArthur Lake as the area with the greatest number of wildlife collisions in the state.

- *Acquire and/or secure easements on private lands.* Forest Capital Partners is the largest private landowner in the corridor, and protecting their working forests from development is a key to success. There is also a patchwork of private agricultural and forest parcels that maintains this linkage zone for wildlife. Securing development rights on these lands is also critical.
- *Enable safe passage* Work with the local community, ITD, Idaho Department of Fish and Game, the Kootenai Tribe, Burlington-Northern Santa Fe, Union Pacific and others to develop and

implement a comprehensive mitigation plan for McArthur Lake, including wildlife crossings, fencing and other measures.

STATUS: *NFWF has supported The Nature Conservancy both with habitat protection as well as highway mitigation efforts for this linkage.*

Second Priority Linkage Areas

Through this effort, a second set of priority Linkage Areas have been identified (in orange in Figure 4). At this time, the Foundation will accept proposals for work in these areas, but these projects are less likely to receive funding than proposals from high priority Linkage Areas or for projects directly affecting the Cabinet-Yaak grizzly population through strategies and activities described below.

STATUS: *NFWF has supported The Blackfoot Challenge with community outreach, range-rider, and a carcass disposal facility all aimed at avoiding conflicts with grizzly bears and wolves. Wildlife populations are increasing and expanding and conflicts are decreasing in the watershed.*

Addressing Threat 2 –Cabinet-Yaak Grizzly Bear Population Size

Goal: Recover the Cabinet-Yaak grizzly bear population

In addition to the activities above, the following strategies and activities are important to the survival and recovery of the grizzly bear population in the Cabinet-Yaak Ecosystem Recovery Zone. We anticipate that projects funded outside priority areas will also often benefit grizzly bear conservation, but will only consider funding grizzly-specific projects that are within this geography.

Strategy 1 Increase Cabinet-Yaak Recovery Area Population

The Cabinet Mountains grizzly population is critically low and the population is currently fragmented from adjacent populations to the north, east, and west. The small number of females in this population limits natural reproduction and population growth. The long-term dispersal of grizzlies to the south into other areas of the Northern Rockies will depend on this population increasing in numbers, survival and reproductive success. The best solution to this problem is a combination of augmentation of the population by placement of more young females into the area combined with mortality control to reduce any further losses and identification of movement opportunity areas and conservation delivery to those areas to reconnect this population with adjacent populations.

- Support translocation of additional female bears into the recovery area.
- Improve demographic connectivity for Cabinet-Yaak in the following priority areas to identify movement opportunities and implement management actions: McArthur Lake, important corridors along Highway 2, and Noxon and along Bull River Road in Kanisku National Forest north on Noxon. Federal agencies and others have developed very specific priorities for land protection and connectivity work in these areas (see Figure 3).
- Identify fine-scale movement areas for areas above using GPS collars on grizzly and black bears to improve predictive models for movement locations.

STATUS: *Between 2007-2010, NFWF helped Montana Fish, Wildlife, and Parks trap and relocate bears, which has resulted in an increase in the number of females with cubs in the Cabinet-Yaak recovery unit to 4 (67% of our goal).*

Strategy 2 Reduce Bear Mortality in and around Cabinet-Yaak Area

Private land development increases bear-human conflicts in the mountain valleys between the large blocks of public land in the Rockies. Bears and other wildlife are either: a) attracted to human developments due to improper storage of attractants such as garbage and pet/livestock foods causing increased mortality risk; or b) avoid such areas and thereby suffer reduced access to key habitats. In the Rocky Mountains, human development is concentrated in the valley bottoms, which are usually in private ownership. Such linear human development in mountain valleys creates fracture zones of high-risk habitat between the large blocks of public land in the Rocky Mountain West.

In addition, there is general consensus among the scientific and conservation community recognizing that human-caused grizzly bear mortality is a key threat to long-term population viability. Of particular concern is mortality of female grizzly bears. The bulk of grizzly bear mortality is spatially distributed on roaded, private lands that abut the periphery of core public lands that act as important core habitat. For example, since approximately 65% of known grizzly bear mortality occurs on a disproportionately small (~17%) area of private land within the Northern Continental Divide Ecosystem recovery area, strategies should also reflect an understanding and sensitivity to private landowners and their livelihood interests. Additionally, as this grizzly bear population shows encouraging signs of growth and grizzlies reoccupy former habitats, reducing mortality will be critical to long-term recovery.

Successful implementation of this plan relies on the engagement of state and federal grizzly bear management specialists from Montana, Idaho, and on tribal lands who are on the front lines of day-to-day conflict management. Their technical expertise and their professional and social ties to their communities is critical to the success of larger efforts to recover the bear, of which this plan is a part.

- Identify site-specific sources of human-caused mortality and conflicts and develop cost-effective means of reducing conflicts and mortalities. Areas such as National Parks that have incorporated comprehensive sanitation management practices in sites likely to be visited by bears have eliminated major opportunities for bear-human conflict and thus improved human safety and reduced bear mortality. Additional mortality and conflict still occurs in many important landscapes that have not yet seen widespread adoption of bear-focused sanitation practices. Expanded support is needed for a large-scale and comprehensive effort to make priority areas identified above bear resistant.
- Determine spatial and temporal extent of known human-bear conflicts and mortalities in specific context by working with local grizzly bear management specialists to prioritize conflict abatement projects. In addition, agricultural related activities have been a long-term contributor to grizzly bear mortality yet adjusting certain practices can dramatically reduce conflicts with bears and reduce economic impacts to farmers and ranchers. In most cases, securing attractants like livestock feed or protecting vulnerable newborns (e.g., calves) using electric fences can stop problems. Thus, we need to support work with grizzly bear management specialists to prioritize conflicts hotspots where agricultural and livestock production practices fall within priority areas. Priorities will be the following attractants and techniques for reducing conflicts (also see Fig. 13):
 - Calving areas.....(electric fences)
 - Sheep.....(electric fence / bedding/night penning areas)
 - Livestock feed.....(bear resistant containers or contain grain within electric fences)
 - Livestock carcasses...(pick up and remove carcasses)
 - Fruit Orchards.....(upgrade existing deer fences with electric when necessary)
 - Beehives.....(solar power electric fences)

- Weed Sheep/Goats....(guard dogs, herding/monitoring, and portable night penning)

To resolve bear-human conflicts support for existing bear conflict coordinators may be needed, or additional support for new staff or coordinators may be needed in priority areas with insufficient existing staff resources.

STATUS: We expect to have funded outreach programs with on-site conflict coordinators in 12 of the 27 linkages by 2012. We are also funding the Sonoran Institute to work on planning issues in the region. We will also support cost-share programs for electric fencing of agricultural areas through a grant to Y2Y.

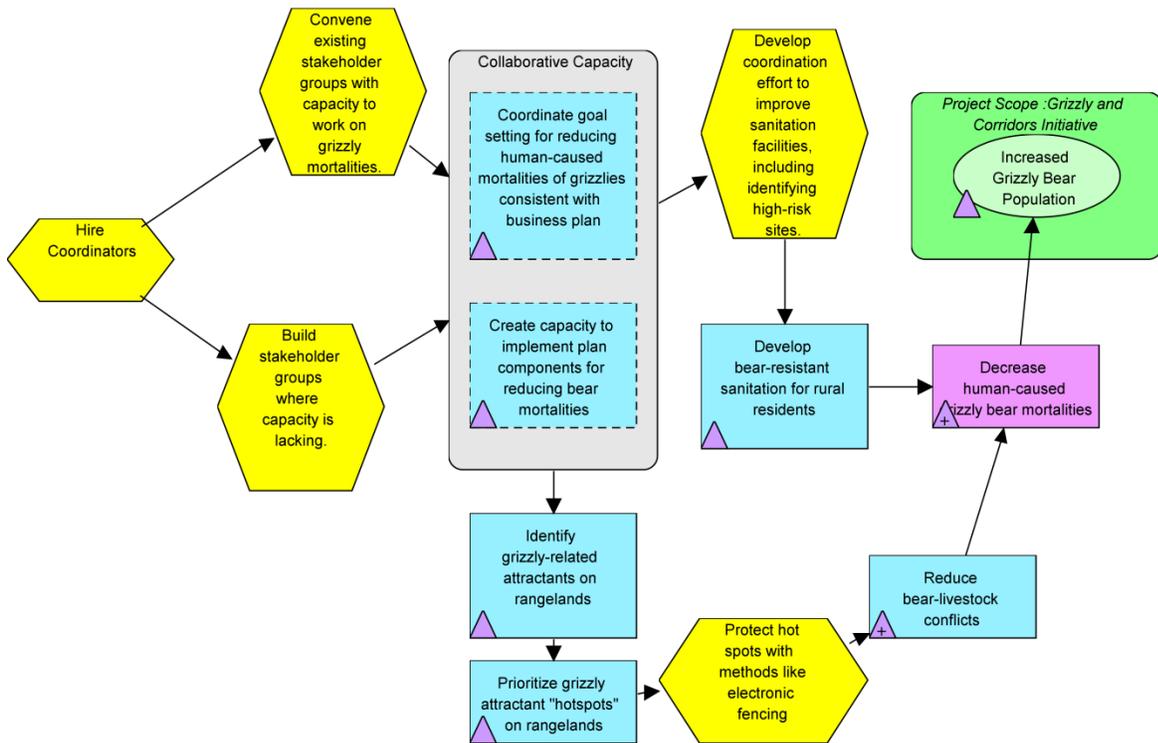


Figure 13. Logic model for strategies to reduce human-caused mortality to grizzly bears.

Monitoring and Evaluating Performance

To better demonstrate results and improve the effectiveness of our conservation investments, a comprehensive monitoring and evaluation strategy has been incorporated into the entire lifecycle of NFWF's initiatives. At initiative inception, NFWF works with scientists and practitioners to develop a business plan that identifies clear conservation goals, strategies to achieve these goals, and metrics for assessing progress. During proposal review, proposals are prioritized based on how well they align with the initiative's priority strategies. At the project level, individual grantees will monitor and provide updates on key project activity and outcome metrics in annual and final reports.

On an annual basis, data across individual projects will be scaled up into an initiative scorecard which will provide a snapshot of progress on the initiative's primary strategies and focal species and habitat outcomes. Every three years, NFWF's in-house evaluator will conduct an assessment to examine the factors that have facilitated and hindered successful implementation of the initiative. Towards the end of the initiative's life cycle, a more comprehensive third-party evaluation may be conducted if resources are available. Findings from all monitoring and evaluation activities will be used to continuously learn from our grantmaking and inform future decision-making to ensure initiative success.

The following performance outcomes are expected from this plan:

- Identification of movement opportunity areas in each of the mountain valleys identified in this proposal in the next 10 years.
- Securing at least one complete movement route in easement and/or acquisition in at least 50% of these movement opportunity areas identified in the next 10 years.
- Documented increased connectivity with increased sightings and evidence of key wildlife species including grizzly bears dispersing into areas outside current range.
- Reduction of exurban development in at least 50% of the movement opportunity areas identified in the next 10 years.
- Movement of grizzly bears and other sensitive species between the large blocks of public lands as documented by surveys and monitoring of GPS-collared animals in the next 10 years.

Scorecard Category	Key Outcomes & Strategies	Metrics	Baseline (2009)	10-yr NFWF objective
Species data	Population data for focal species	Grizzly bear population	2 females with cubs in recovery unit	6 females with cubs in recovery unit
	Other conservation goals	Human-caused mortality to grizzly bears; permeability of corridors	Human-caused mortality at (0.7); 0 linkages secured	Human-caused mortality for grizzly bears at 0; 10 linkages secured
Habitat Conservation	Easements	acres		100,000
Habitat Restoration		Acres		500
Habitat Management	Improve highway permeability	Crossing improvements		7
Capacity, Outreach, Incentives	Outreach programs or marked improvement in focal areas			Implemented in all priority corridors in need of this activity
Species-Specific Strategies	Increase population through translocation	Bears translocated		10
Research, M&E	Priority linkages assessed, transportation hotspots identified			

Table 2. A snapshot of the key outcomes and strategies expected from implementation of this initiative (in progress).

NFWF and partners are working to establish goals and criteria related to maintaining and enhancing connectivity and we will update this plan with those goals as they become available. In the meantime, we know that grizzly populations and those of other sensitive species like wolverine and lynx will continue to be further fragmented in the Northern Rockies by ongoing human development unless this project is completed. Rates of fragmentation are difficult to calculate but we know, using the Yellowstone ecosystem as an example, that exurban development (land development at one home per 1–40 acres) has increased 350% between 1970-1999 while human populations have only increased 58% during the same time period. This exurban development is the type of development that occurs in wildlife habitat and causes wildlife population fragmentation as mountain valleys fill with human settlements. Without the involvement of NFWF and other partners to fund land protection, development will completely eliminate most movement opportunities for sensitive wildlife between the large blocks of public land in the Northern Rockies by 2020.

Long-term monitoring is crucial to understand how animals are using the landscape, where the most important wildlife corridors are, whether identified corridors/linkages are functional, and how species respond to changes in landscape connectivity over time. Furthermore, monitoring programs are most successful when they are implemented at the landscape scale. This is one of the greatest challenges to establishing rigorous monitoring because the ideal program often exceeds both the financial and physical capacity of the organization or institution doing the research.

Fairly strong distributional datasets exist for elk, wolves and grizzly bears. For both wolves and grizzly bears, information is needed on both the extent of connectivity between core areas as well as patterns of population expansion and individual movement. For grizzlies, genetics studies are shedding new light on population connectivity and movement patterns (Proctor et al. 2012). The Cabinet-Yaak Ecosystem is a key area to expand these efforts. Compared to elk, wolves and bears, less information on the distribution and movement patterns of lynx and wolverines exists, particularly within the Cabinet-Yaak Ecosystem. The best information for these species comes from around Glacier and Yellowstone National Parks. All lynx and wolverine research would benefit from additional funding and capacity to broaden the geographic scope and ensure longevity.

From a landscape connectivity perspective, monitoring programs would benefit most from sustained, long-term funding to maintain and/or expand the scope and capacity for monitoring movement patterns of individuals within focal species populations. Additional work is needed to develop transparent and accessible reporting on road mortality of these species and for ungulates, on the numbers and timing of movement through the Linkage Areas that are the focus of this plan.

Specific to grizzly bear, the following metrics will provide a useful guide to whether the actions taken under this Business Plan and through other efforts are working:

1. The U.S. Geological Survey and a host of agency partners have recently completed a rigorous population estimate for the grizzly bear population in the Northern Continental Divide Ecosystem (Kendall et al. 2009). This point estimate will allow for a population trend monitoring effort led by MT Fish, Wildlife and Parks that is currently underway (Mace 2005). The U.S. Fish and Wildlife Service is the lead agency that monitors the Cabinet-Yaak grizzly bear population.
2. The U.S. Fish and Wildlife Service and MT Department of Fish, Wildlife and Parks collaboratively document annual grizzly bear mortality for the NCDE and Cabinet-Yaak recovery areas. NFWF will update our 'scorecard' annually with information from this assessment.
3. Field level grizzly bear management specialists from MT Department of Fish, Wildlife and Parks respond to and document all reported and verified grizzly bear conflicts throughout Montana. Currently these conflict data are being standardized and housed under the U.S. Geological Survey.

Funding Needs

Success in achieving the goals of this business plan depends upon the Foundation raising and spending \$12 million over 10 years on the strategies described herein. It also depends upon government and non-government agencies and organizations and mitigation funds providing an additional \$90-\$100 million which are allocated to implement the strategies and activities described in this plan.

Table 2.0 Preliminary Costs Estimates for Activities Outlined in Business Plan

Activity	NFWF Contribution	Additional Investments
Prevent Loss of Wildlife Movement Areas		
Identify the most important corridors	\$100,000	\$500,000
Prevent development on key corridor parcels		
Prioritization	\$200,000	\$300,000
Protection	\$4,000,000	\$55,000,000
Local Planning	\$1,700,000	\$1,700,000
Reducing road and railway impacts	\$2,500,000	\$24,000,000
Cabinet-Yaak Grizzly Bear Population Size		
Increase bear population	\$1,000,000	\$3,000,000
Reduce bear mortality	\$2,500,000	\$7,000,000
TOTAL	\$12 million	\$91.5 million

Long-Term Foundation Support

This framework and the associated linkage business plans lay out a framework to achieve outcomes that benefit wildlife over a 10-year period. At that time, it is expected that the conservation actions partners have taken will have brought about new institutional and societal standards and environmental changes that will have set the population in a positive direction such that maintaining those successes or continuing them will be possible without further (or greatly reduced) NFWF funding. To help ensure that the population and other gains made in 10 years won't be lost after the exit of NFWF funding, the partnership must seek development of solutions that are long-lasting, cost-effective, and can be maintained at lower levels of funding in the future or with other secure sources of funds. Therefore, part of the evaluations of this initiative will address that staying power and the likelihood that successful strategies will remain successful into the future.

The adaptive nature of this initiative will also allow NFWF and partners to regularly evaluate the strategies behind our objectives, make necessary course corrections or additions within the 10 year frame of this business plan. In some cases these corrections and additions may warrant increased investment by NFWF and other partners. However, it is also possible that NFWF would reduce or eliminate support for this initiative if periodic evaluation indicates that further investments are unlikely to be productive in the context of the intended outcomes.

The National Fish and Wildlife Foundation (NFWF) protects and restores our nation's wildlife and habitats. Created by Congress in 1984, NFWF directs public conservation dollars to the most pressing environmental needs and matches those investments with private contributions. NFWF works with government, nonprofit and corporate partners to find solutions for the most intractable conservation challenges. In 27 years, NFWF has funded more than 4,000 organizations and committed more than \$2 billion to conservation projects. Learn more at www.nfwf.org.

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Additional Benefits

Preliminary value added benefits from the activities outlined in this business plan are the following:

- 1) Bear resistant product industry will realize significant sales increases.
- 2) Fencing contractors throughout the NCDE region will realize significant increase in contracts and would likely create 3-5 part-time jobs.
- 3) Land trust organizations could realize increase funds and subsequently hire additional staff necessary to procure conservation easements for grizzly bear habitat protection and in wildlife movement areas.
- 4) Seasonal, wildlife technical positions would create jobs (5-7) throughout the NCDE.
- 5) Increased opportunities for wildlife viewing / ecotourism.
- 6) Increase hunting opportunities for big game species like elk, big horn sheep as indirect benefits to these species will likely occur from wildlife movement area conservation.

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