



CONSERVATION VALUE OF ROADLESS AREAS FOR VULNERABLE FISH AND WILDLIFE SPECIES IN THE CROWN OF THE CONTINENT ECOSYSTEM, MONTANA



By John L. Weaver

WCS Working Papers: ISSN 1530-4426

Online posting: ISSN 1534-738

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CONSERVATION VALUE OF ROADLESS AREAS FOR VULNERABLE FISH AND WILDLIFE SPECIES IN THE CROWN OF THE CONTINENT ECOSYSTEM, MONTANA

by John L. Weaver

Wildlife Conservation Society
North America Program
301 North Willson Avenue
Bozeman, Montana
59715



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SUMMARY

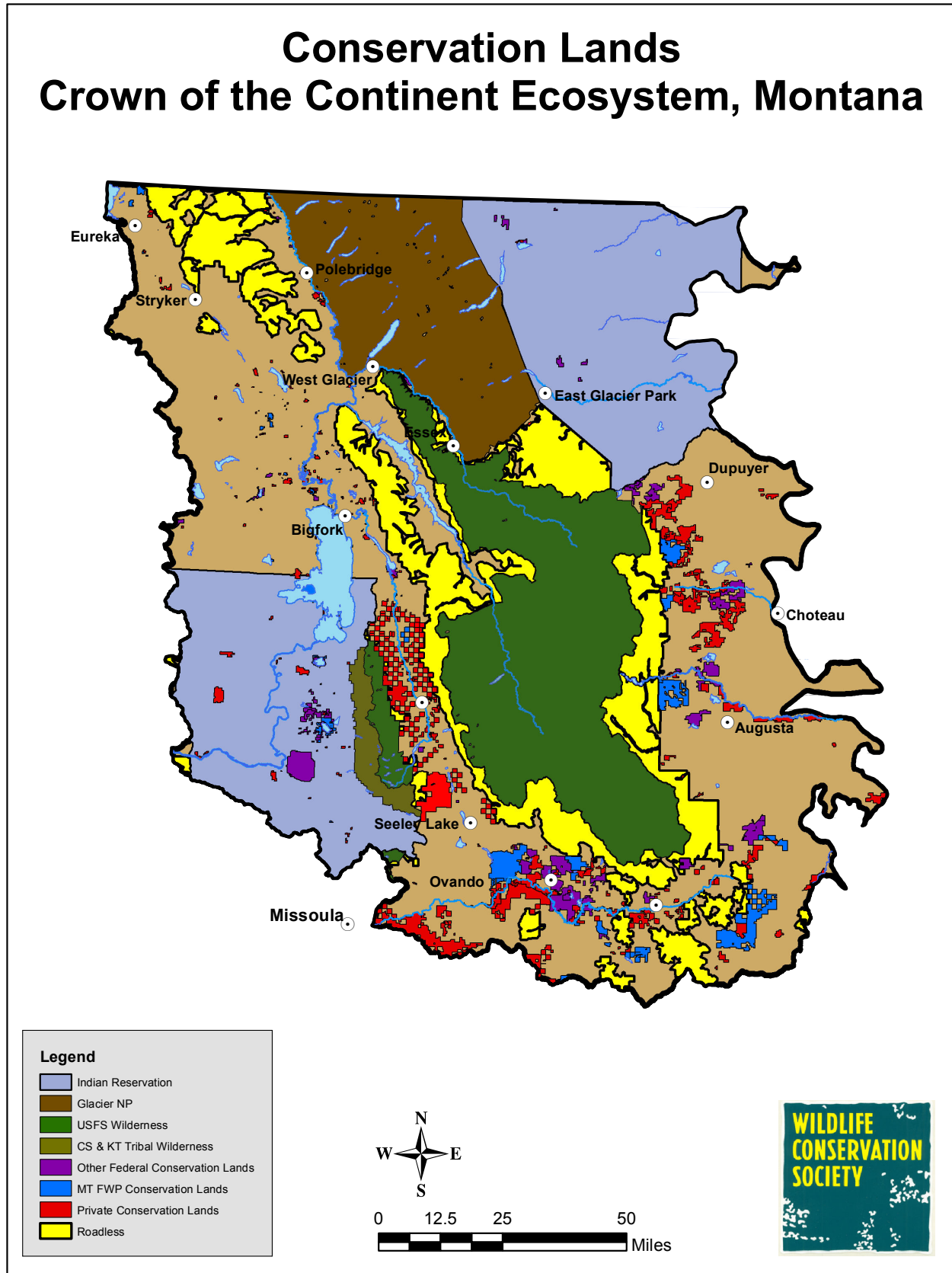
The Crown of the Continent Ecosystem is one of the most spectacular landscapes in the world and most ecologically intact ecosystem remaining in the contiguous United States. Straddling the Continental Divide in the heart of the Rocky Mountains, the Crown of the Continent Ecosystem extends for >250 miles from the fabled Blackfoot River valley in northwest Montana north to Elk Pass south of Banff and Kootenay National Parks in Canada. It reaches from the short-grass plains along the eastern slopes of the Rockies westward nearly 100 miles to the Flathead and Kootenai River valleys. The Crown sparkles with a variety of dramatic landscapes, clean sources of blue waters, and diversity of plants and animals.

Over the past century, citizens and government leaders have worked hard to save the core of this splendid ecosystem in Montana by establishing world-class parks and wildernesses – coupled with conservation of critical wildlife habitat on state and private lands along the periphery. These include jewels such as Glacier National Park, the Bob Marshall-Scapegoat-Great Bear Wilderness, the first-ever Tribal Wilderness in the Mission Mountains, numerous State of Montana Wildlife Management Areas (WMAs), and vital private lands through land trusts such as The Nature Conservancy. Their combined efforts have protected 3.3 million acres and constitute a truly impressive commitment to conservation. It was a remarkable legacy and great gift ...but, in the face of new challenges, it may not have been enough.

The melting glaciers of Glacier National Park signal that ecosystems already are experiencing changes in climate that may become even more pronounced in the next century. Climate scientists have documented the following patterns in the western United States (including the Crown): warmer winters and hotter summers, decreasing snowpack and earlier melting in spring, declining stream flows and warmer streams, and longer wildfire season with more severe fires. During warming episodes in past millennia, plants and animals in North America generally shifted north in latitude and (in mountains) upward in elevation. Of course, there were no roads and other human infrastructure back then that posed barriers to shifts by species in response to climate change.

One of the key climate-smart strategies is: *promote resiliency by keeping future options open through an emphasis on ecological variability across space and time*. A broad consensus has emerged on the following actions to promote such resiliency: (1) increase the extent and effectiveness of protected areas,

Figure 3. Location of conservation lands in the Crown of the Continent Ecosystem, Montana, 2010. Remaining roadless areas are highlighted in yellow.



(2) enhance connectivity within and around large ecosystems, and (3) reduce pressure on species and ecosystems from sources other than climate change. In an ever-changing world where impacts of habitat loss and fragmentation, invasive species, and climate warming are accelerating, vulnerable species will persist longer with well-designed networks of core refugia and connectivity that offer ecological options.

In the Montana portion of the Crown of the Continent Ecosystem, more than 1 million acres of public lands remain roadless. This presents a large-scale opportunity to complete the legacy of conservation in this spectacular and treasured landscape. One of the key land policy questions is: What is the conservation value of these roadless areas for vulnerable fish and wildlife that are important to Montanans and others?

The purpose of this report is to inform discussions and decisions about the remaining roadless areas in the Crown of the Continent Ecosystem, Montana. The goal is to assess the conservation value of 1.33 million acres of roadless areas for a suite of vulnerable species using latest scientific information about their occurrence and conservation needs. Specific objectives are to: (1) determine the geographic occurrence of these species, (2) examine connectivity relative to other Wilderness/Park lands and for movement options in response to climate change, and (3) make recommendations for various levels of wildland protection. The approach involves synthesis of available spatial data into maps of conservation value for vulnerable species and a geographical narrative to draw attention to key areas. For assessing the conservation value of roadless areas in the Crown of the Continent Ecosystem in Montana, I selected the following suite of fish and wildlife species: bull trout (*Salvelinus confluentus*), westslope cutthroat trout (*Oncorhynchus clarki lewisi*), grizzly bear (*Ursus arctos horribilis*), wolverine (*Gulo gulo*), mountain goat (*Oreamnus americanus*), and Rocky Mountain bighorn sheep (*Ovis canadensis*). These species have limited resiliency to human impacts and thus are vulnerable.

Bull trout and westslope cutthroat trout exhibit high vulnerability. They have a cold-water niche – especially for spawning and rearing – and low resistance to warming water. Both trout have low resistance to invasion by non-native trout, too. Although adult bull trout can move long distances, human fragmentation of streams can have acute impacts on connectivity. Bull trout and westslope cutthroat trout are vulnerable to several detrimental effects of human activities associated with roads. Finally, climate change may diminish the unique thermal niche of these trout and lead to smaller, more isolated and less viable populations. Protection of large and well-connected patches of cold-water habitat remains an important element in the conservation of bull trout and genetically-pure westslope cutthroat trout.

Despite their resourcefulness, grizzly bears exhibit high vulnerability due to low demographic or population resiliency. Bears have very low reproduction and cannot quickly compensate for excessive mortality. Young females do not disperse very far, which makes bear populations susceptible to landscape fragmentation. Protection of large areas of productive habitats with security from human disturbance and mortality are key themes in conservation of grizzly bears.

VULNERABLE FISH AND WILDLIFE SPECIES

CROWN OF THE CONTINENT ECOSYSTEM, MONTANA



Grizzly Bear



Bull Trout



Wolverine



Westslope Cutthroat Trout



Mountain goat



Rocky Mountain Bighorn Sheep

Wolverines exhibit high vulnerability. Although they have a broad foraging niche, wolverines select areas with persistent snow cover during spring for their reproductive habitat, summer habitat, and dispersal routes. Wolverines have extremely low reproductive rates, too. Consequently, they cannot sustain high mortality rates, which can be exacerbated by trapping pressure – especially in areas of disjunct habitat patches. Trapping may diminish the likelihood of successful dispersal by juvenile wolverines, which could be important to the viability of regional populations. Wolverines appear sensitive to human disturbance near maternal sites. Due to their adaptation for snow environments, wolverines appear particularly susceptible to reductions in suitable habitat as a result of projected climate change.

Mountain goats exhibit high vulnerability. They are constrained to live on or very near cliffs that provide escape terrain from predators and more accessible forage in winter. Female goats have very low reproduction and cannot quickly compensate for excessive mortality (notably hunting). Goats, particularly males, do disperse modest distances which may provide connectivity among some populations. Mountain goats are especially sensitive to motorized disturbance and access.

Bighorn sheep exhibit moderate vulnerability. They have a narrow feeding niche on grasses and are constrained to live on or near cliffs for escape terrain. Female sheep have low to moderate reproduction, but wild sheep are highly susceptible to outbreaks of disease (some carried by domestic sheep) that can decimate a herd quickly. Because Rocky Mountain bighorn sheep have strong fidelity to chosen sites, they do not disperse very readily and have a low capacity for re-colonizing vacant habitats. Bighorn sheep appear less sensitive to motorized disturbance than goats. In terms of climate-smart conservation strategies, maintaining secure access to cliffs and rocky terrain along an elevation gradient could provide options for bighorn sheep on montane winter ranges.

Protected wildlands have a vital role to play in the conservation of such vulnerable fish and wildlife. Protected wildlands: (1) provide secure access to habitat with less risk of human-caused mortality and unsanctioned release of non-native fish, (2) facilitate better connectivity for population and genetic exchange, and (3) afford more room for animals to shift in response to shortfall in key foods or changes in climate. Although some of the detrimental effects of roads can be mitigated with proper design and management (such as permanent or seasonal closure), vulnerable populations of fish and wildlife have a better chance to prosper and persist in large protected areas.

Although a considerable amount of information has been collected for most of these vulnerable species, it had not been fully compiled and displayed. Therefore, I compiled and synthesized the latest available spatial information for these species in Arc GIS 9.3 to produce maps of their present occurrence. To the extent that data spans long periods of varying environmental conditions, maps of occurrence integrate much information about which areas *sustain* these vulnerable species. To supplement the GIS maps, I spent 112 days during 2009-2010 on foot and horseback in field reconnaissance of these roadless areas around the Crown of the Continent Ecosystem in Montana.

To assess the relative importance of roadless areas, I developed a scoring system to quantify the conservation values for vulnerable fish and wildlife species. The scoring system comprised 3 relative ranks: *Moderate* Importance = score of 1, *High* Importance = score of 2, and *Very High* Importance = score of 3. The very high score typically included considerations of likely effects of climate change, with the intention of providing some future options for that species. The purpose of the ranking system was to inform choices about designation of roadless areas.

I recommended the following designations for wildland protection: (1) *Wilderness* for roadless areas that scored high and very high composite conservation values, (2) *Backcountry* for areas that scored lower (moderate) composite conservation values, wherein management would emphasize remote recreation opportunity in roadless areas, and (3) *Wildland Restoration Zone* where certain key roads would be de-commissioned or otherwise permanently closed and returned to more natural condition. Such restoration would increase security value of adjacent lands for vulnerable wildlife and enhance the configuration (less edge exposure to deleterious impacts) of recommended Wilderness areas.

The **Rocky Mountain Front** marks where the Great Plains first meet the dramatic uplift of the Rocky Mountains along the eastern border of the Crown of the Continent Ecosystem. Ranching families, organizations like The Nature Conservancy, and the State of Montana have worked long and hard to conserve private lands and wildlife along the foothills of the Rocky Mountain Front. On its western flank, the Bob Marshall Wilderness and Scapegoat Wilderness protect the high mountain country near the Continental Divide. Between these landmark landscapes, approximately 388,160 acres of *roadless* lands remain – with varying conservation value for vulnerable fish and wildlife species. The most concentrated network of streams with genetically-pure populations of westslope cutthroat trout and potential for restoration occurs in the Badger-Two Medicine area. The Rocky Mountain Front is the last place where grizzly bears still range out onto the prairie as they did in olden times. The northern sector of the Rocky Mountain Front from Highway 2 south to Teton River supports a higher relative density of grizzly bears than the sector south of the Sun River. Primary habitat for resident adult wolverines is widespread along the Rocky Mountain Front, but blocks of maternal habitat for wolverine become smaller and more isolated along the eastern foothills and toward the south end of the Front. The Rocky Mountain Front provides habitat for one of the largest native populations of mountain goats in Montana. The heart of the goat range extends from the high peaks of the Badger-Two Medicine area south to the Deep Creek area. Some of the largest herds of bighorn sheep in America range across the spectacular rocky reefs and wind-swept montane grasslands along the Rocky Mountain Front.

Several roadless areas along the Rocky Mountain Front scored very high or high in composite conservation value for these vulnerable fish and wildlife species. Accordingly, I recommend that 306,288 roadless acres (78.9%) of high-priority lands be designated as **Wilderness**: ✓ most of the Badger-Two Medicine area, ✓ Walling Reef south to Choteau Mountain, ✓ headwaters of

Teton River, ✓ all of Deep Creek watershed, ✓ some areas north of Gibson reservoir, ✓ Renshaw Mountain-Fairview Plateau area between Gibson Reservoir and the Benchmark road, ✓ headwaters of Smith Creek and Elk Creek, and ✓ upper section of the Dearborn River and West Fork of Falls Creek. I further recommend that 81,218 acres (20.9%) of moderate-priority lands be managed in roadless condition as ‘Backcountry’ with emphasis on non-motorized recreation and security of fish and wildlife populations.

The **Blackfoot – Clearwater River Basin** frames the southern border of the Crown of the Continent Ecosystem. The fabled Blackfoot River threads a glaciated valley of grass-sage, and forests of pine and fir on lower slopes transition to more open forests on the ridges. The Blackfoot Challenge – a group of land-owners, business owners, land trusts like the Nature Conservancy, and resource management agencies – are working hard to conserve and enhance natural resources and a rural way of life for present and future generations. A string of glacier-carved lakes grace the Clearwater River valley, where mesic forests rise more sharply to rugged ridges and cirque basins. The Montana Legacy Project has secured protection of thousands of acres of corporate timber land in these watersheds. The Bob Marshall Wilderness and Scapegoat Wilderness protect the high mountain country along the edges of these basins.

Approximately 297,830 acres of *roadless* lands remain in these two watersheds – with varying conservation value for vulnerable fish and wildlife species. The Blackfoot River and Clearwater River plus 17 tributaries have been designated as critical habitat for bull trout. Westslope cutthroat trout occur throughout both river systems, with a wide spectrum of genetic integrity. At present, numerous headwaters streams still harbor genetically-pure populations of these native trout. Relative density of grizzly bears here is lower than in more northerly sectors of the Crown of the Continent Ecosystem, but grizzlies appear to be expanding their range southward through the Blackfoot River basin. For wolverines and mountain goats, the cirque basins and high peaks in the Blackfoot-Clearwater country represent the southern and western edge of an extensive set of large, well-connected blocks of suitable habitat stretching northward across the Bob Marshall and Scapegoat Wildernesses. In addition, the roadless headwaters of Monture Creek provide important summer/fall range for the Blackfoot-Clearwater elk herd.

Several areas in the Blackfoot-Clearwater River basin scored very high or high in composite conservation value for these vulnerable fish and wildlife species. Accordingly, I recommend that 134,159 roadless acres (45.0%) of high-priority lands be designated as **Wilderness**: ✓ Swan Range from Wolverine Peak at the headwaters of the Clearwater River south to Limestone Pass above Monture Creek, ✓ from Limestone Pass southeast along the watershed divide of the Blackfoot River past Arrastra Mountain, then east to the head of Alice Creek basin, and ✓ headwaters of West Fork Clearwater River and Marshall Creek.

I further recommend that 58,930 roadless acres (19.8%) of moderate-priority lands be managed in roadless condition as ‘Backcountry’ with emphasis on non-motorized recreation and security of fish and wildlife populations. Several isolated blocks of roadless lands totaling 104,742 acres (35.2%) south

of Highway 200 are disjunct from the main complex of wilderness and roadless areas and provide lower (moderate) conservation values for these vulnerable fish and wildlife. Consequently, I have not proposed any particular designation for them.

The **Swan River and Southern Flathead River Basin** includes three major tributaries to Flathead Lake on the west side of the Crown of the Continent Ecosystem, Montana – the Swan River, the South Fork of the Flathead River, and the Middle Fork of the Flathead River. Diverse coniferous forests clothe the steep slopes, and jewels of tarn lakes are set among the rugged peaks, a few glaciers, and cirque basins. The Montana Legacy Project has secured protection of thousands of acres of corporate timber land in the Swan Valley. Some of the roadless areas are bordered by Glacier National Park, the Great Bear Wilderness, and the Bob Marshall Wilderness. Substantial roadless lands along the northern part of the Swan Range are not protected by any wildland legislation.

Approximately 376,594 acres of roadless areas exist currently along the Swan Range and the southern Flathead River basin. Cold-water drainages in the Swan River and Southern Flathead River basins have been deemed a vital stronghold for bull trout in the Columbia River system. About half (18) of the tributaries designated as critical habitat for this threatened native trout have their headwaters in roadless areas. Numerous streams in the Flathead Rivers also have pure populations of westslope cutthroat trout, and the South Fork Flathead River is considered the stronghold for this native species. Suitable primary and maternal habitat for wolverine occurs throughout much of the Swan Range and southern Flathead, where relative density of grizzly bears is also high. The southern crest of the Swan Range and the Flathead Range hold traditional maternal habitat for mountain goats, but goat populations may have been diminished due to ease of hunter access afforded by expanding road system.

Several areas in the Swan River and Southern Flathead River basin scored very high (especially the Swan Range) or high in composite conservation value for these vulnerable fish and wildlife species. Accordingly, I recommend that 253,554 roadless acres (67.3%) of high-priority lands be designated as **Wilderness**: ✓ small areas in Elk Creek and Piper Creek and around upper Lindbergh Lake, ✓ Swan Range from Holland Lake north to Inspiration Point an area and around Spotted Bear Mountain, ✓ higher portions of the Swan Range from Bunker Creek north to Columbia Mountain, ✓ above the east shore of Hungry Horse Reservoir, the basins from Unawah Mountain south to Dry Park Mountain, ✓ Paola Ridge area above the lower Middle Fork Flathead River, and ✓ Slippery Bill Mountain and Patrol Ridge area along the Continental Divide in the Middle Fork of the Flathead River basin. I further recommend that 106,286 roadless acres (28.2%) of moderate-priority lands be managed in roadless condition as ‘Backcountry’ with emphasis on non-motorized recreation and security of fish and wildlife populations.

A number of primitive, old logging roads extend westward from Hungry Horse Reservoir and penetrate rather deeply into the narrow Swan Range. In recognition of the important fish and wildlife values in the Swan Range, the

Flathead National Forest has closed many of these roads on a permanent or seasonal basis. Nonetheless, some of these roads still receive unauthorized ATV use or may be open to snow machine use in winter which, in some cases, may impact wildlife. To enhance security for vulnerable wildlife and configuration of recommended Wilderness areas, I propose that the upper sections of several primitive roads be considered for wildland restoration (de-commissioned or otherwise permanently closed and returned to more natural condition).

The **North Fork Flathead River Basin and Ten Lakes** roadless area drapes over the Whitefish Range along the western edge of the Crown of the Continent Ecosystem in Montana. The North Fork Flathead River begins in British Columbia and meanders southward through a broad basin and across the international border, marking the west boundary of Glacier National Park. A mix of roadless and logged Forest Service lands occurs west of the Flathead River. International concern and attention to conservation issues in this critical trans-boundary watershed have increased markedly in recent times. The Ten Lakes Scenic Area is the centerpiece of a roadless area on the west side of the Whitefish Range.

Approximately 272, 443 acres of roadless areas exist currently in the North Fork Flathead River Basin and Ten Lakes roadless area. The North Fork Flathead River and 8 major west-side tributaries have been designated as critical habitat for threatened bull trout, which migrate up to 75 miles from Flathead Lake to spawn in their natal streams with unique genetic signatures. Another set of clean and cold streams in the vicinity of Ten Lakes have also been designated as critical habitat for this native species. Most of the genetically-pure populations of westslope cutthroat trout occur in the northern section of the North Fork Flathead River and in a few streams in the vicinity of Ten Lakes. Relative density of grizzly bears is high throughout much of the North Fork Flathead River watershed. Suitable habitat for wolverine occurs throughout much of the Ten Lakes and North Fork Flathead River basin, but blocks of maternal habitat become progressively smaller and less connected toward the south and southeast. A trans-border herd of bighorn sheep with unique genetic composition spends the summer and fall in the Ten Lakes area and winters on a nearby Montana Wildlife Management Area (WMA).

Several roadless areas in the North Fork Flathead River Basin – Ten Lakes area scored high or very high in composite conservation value for these vulnerable fish and wildlife species. Accordingly, I recommend that 193, 460 roadless acres (71.0%) of high-priority lands be designated as a new **Wilderness** area: ✓ Thoma-Mount Hefty area, ✓ Tuchuck area, ✓ Mount Thompson-Seton south to Lake Mountain (including the headwater basins of Williams Creek and Blue Sky Creek on the west side of the Whitefish Divide), ✓ headwaters of Hay Creek and Coal Creek, ✓ south end of Whitefish Range from Haines Pass south to Werner Peak, and ✓ Ten Lakes Scenic Area and the area east of upper Wigwam River including Stahl Peak, Wam Peak, and north nearly to the Canadian border. This complex of wilderness would protect the highest-value habitats, enhance connectivity with both Glacier National Park and the Canadian Flathead, and underscore American commitment to protecting the ecological integrity of the trans-boundary Flathead region.

I further recommend that 63,890 acres (23.5%) be managed in roadless condition as 'Backcountry' with emphasis on non-motorized recreation and conservation of fish and wildlife. To enhance security for vulnerable wildlife and configuration of recommended Wilderness areas, I propose that the upper sections of several primitive roads be de-commissioned or otherwise permanently closed and returned to more natural condition.

Many of the remaining roadless areas in the Crown of the Continent Ecosystem in Montana have high conservation value for vulnerable fish and wildlife species. Based upon a thorough spatial assessment, I recommend that:

- ✓ 887,461 acres (66.5%) be legislated as **Wilderness**,
- ✓ 310,320 acres (23.2%) be designated as Backcountry, and
- ✓ 82 miles of old, primitive logging roads be restored to natural condition for wildlife security.

These actions would protect habitats vital for year-round ranges, safeguard genetic integrity, enhance connectivity, and provide options for movement in response to changing conditions.

Here – where native trout fin their way back to natal streams to spawn in the clean, cold blue waters of the Rockies ... where herds of bighorn sheep nibble short grasses with the roar of chinook winds and eagle wings in their ears ... where the wild challenge of a bull elk trumpets across a September sunrise – lays an opportunity to complete the legacy of conservation in the Crown of the Continent Ecosystem in Montana and to sustain the wild heartbeat of Life for present and future generations.

4. ROCKY MOUNTAIN FRONT



Rick and Susie Graetz

The Rocky Mountain Front marks where the Great Plains first meet the dramatic uplift of the Rocky Mountains. Reef formations from ancient sea beds frame the eastern border of the Crown of the Continent Ecosystem for 150 miles along the Front from Rogers Pass north to the Canadian border. Montanans know the Front as the place where mighty chinook winds have warmed winter temperatures from 15°F to 50°F in minutes and swept the foothills and plains clean of snow. Considerable physical and habitat diversity is compacted in a short distance from the grasslands westward to alpine plateaux on the Continental Divide. Here is the last place in America where one might see a grizzly bear roaming out onto the prairie as in olden times.

Ranching families, organizations like The Nature Conservancy, and the State of Montana have been working hard to conserve private lands and wildlife along the foothills of the Rocky Mountain Front. On its western flank, the Bob Marshall Wilderness and Scapegoat Wilderness protect the high mountain country near the Continental Divide. Between these landmark landscapes remain about 388,000 acres that is still roadless and unprotected in legislation. What is the conservation value of these roadless lands, especially for vulnerable species that Montanans and other people treasure?

Figure 12. Composite conservation values for suite of vulnerable fish and wildlife species, Rocky Mountain Front, Crown of the Continent Ecosystem, Montana.

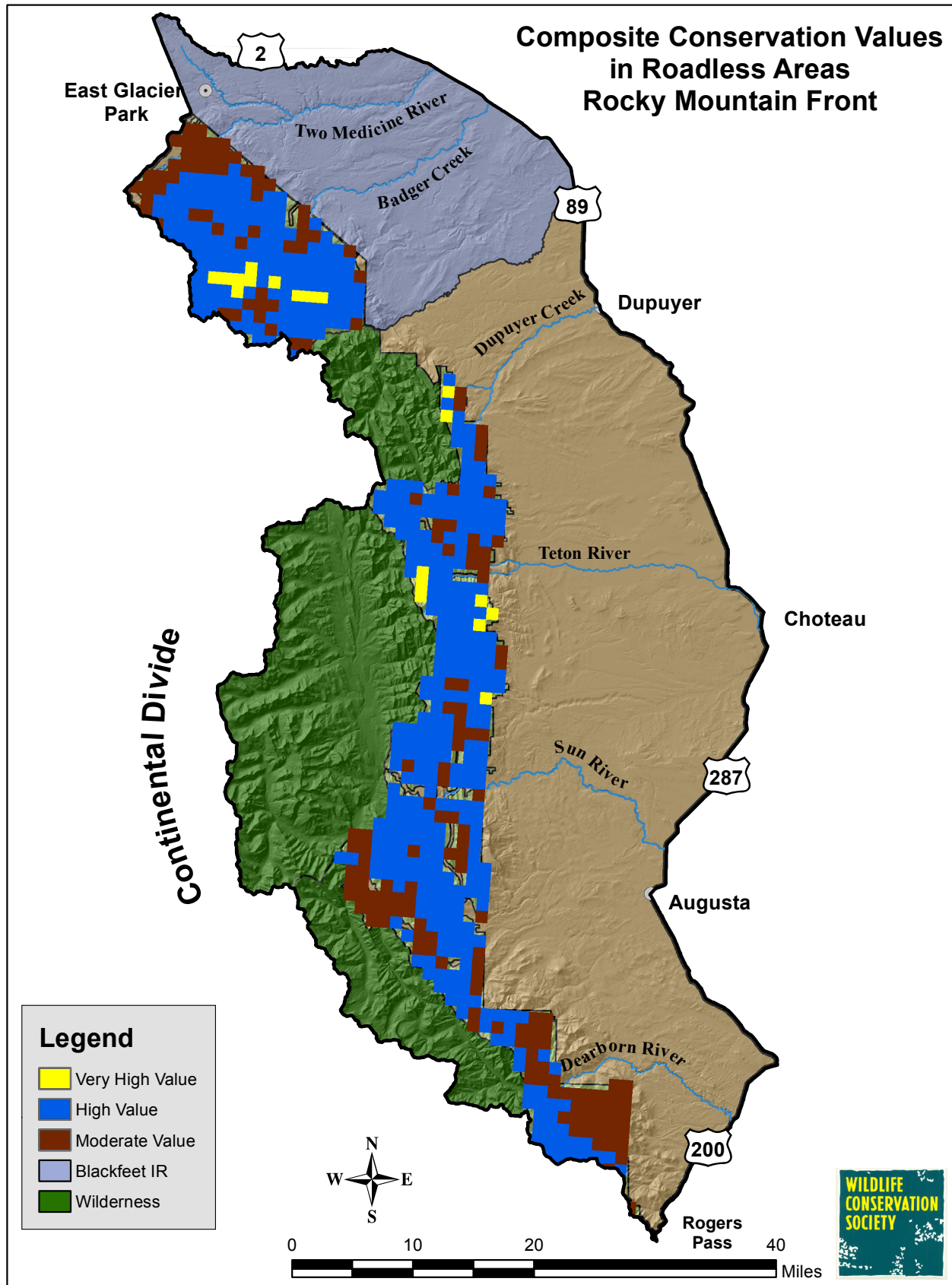
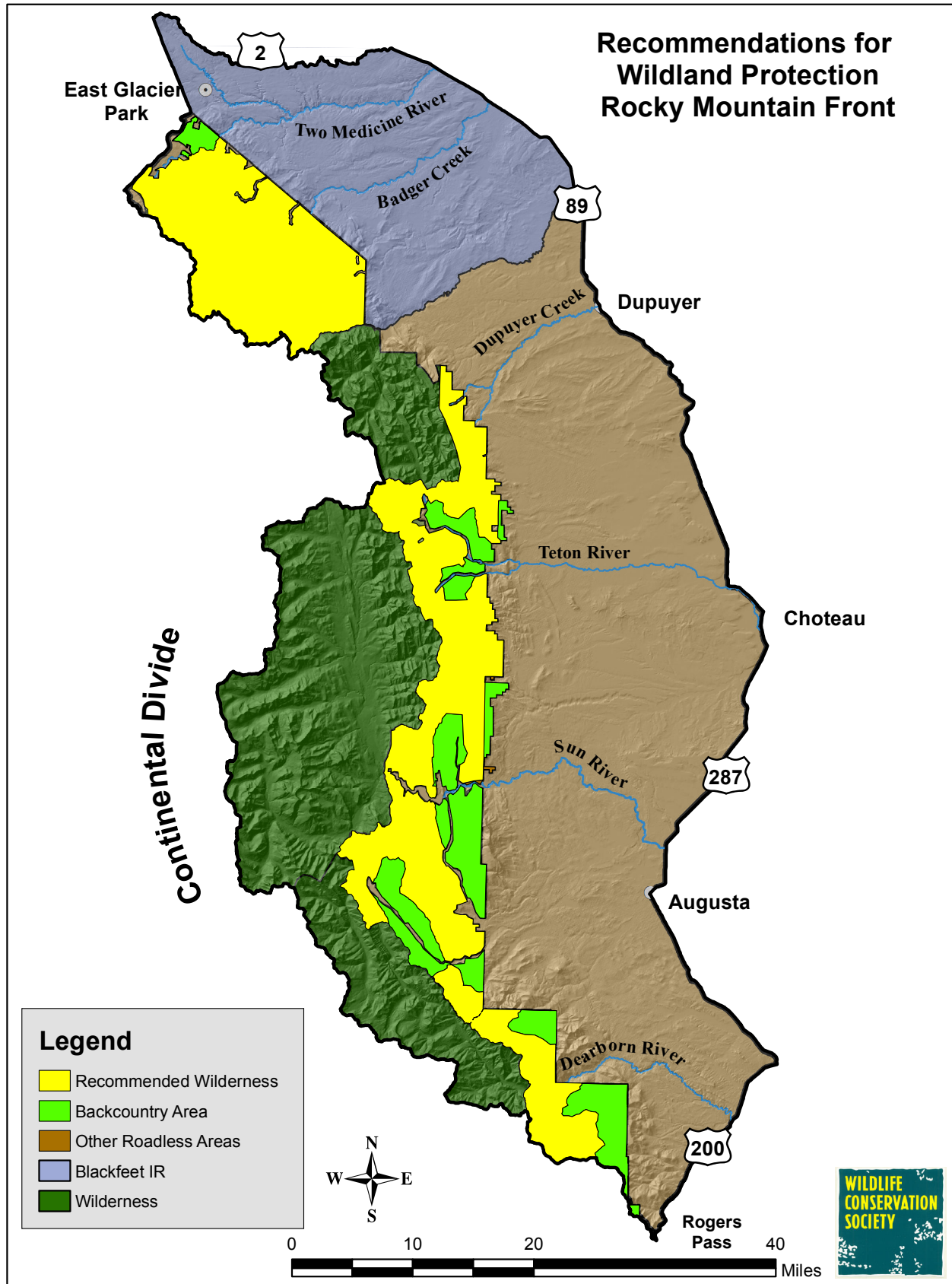


Figure 13. Recommendations for wildland protection, Rocky Mountain Front, Crown of the Continent Ecosystem, Montana.



5. BLACKFOOT – CLEARWATER RIVER BASIN



Bitterroot

The Blackfoot-Clearwater River basin frames the southern section of the Crown of the Continent Ecosystem. The fabled Blackfoot River threads a glaciated valley of grass-sage, and forests of pine and fir on lower slopes transition to more open forests on the ridges. The Blackfoot Challenge – a group of energetic landowners, business owners, land trusts like the Nature Conservancy, and resource management agencies – are working hard to conserve and enhance natural resources and a rural way of life for present and future generations. A string of glacier-carved lakes grace the Clearwater River valley, where mesic forests rise more sharply to rugged ridges and cirque basins. The shining Mission Mountains frame the west side of the Clearwater River basin. The Montana Legacy Project has secured protection of thousands of acres of corporate timber land in these watersheds. The Bob Marshall Wilderness, Mission Mountains Wilderness (USFS/CSKT), and South Fork Jocko Tribal Primitive Area, and Scapegoat Wilderness protect the high mountain country along the edges of these basins.

Between these treasured landscapes lay $\approx 300,000$ acres that are still *roadless* and unprotected in legislation. What is the conservation value of these roadless lands for vulnerable fish and wildlife species?

Figure 19. Composite conservation values for suite of vulnerable fish and wildlife species, Blackfoot – Clearwater River Basin, Crown of the Continent Ecosystem, Montana.

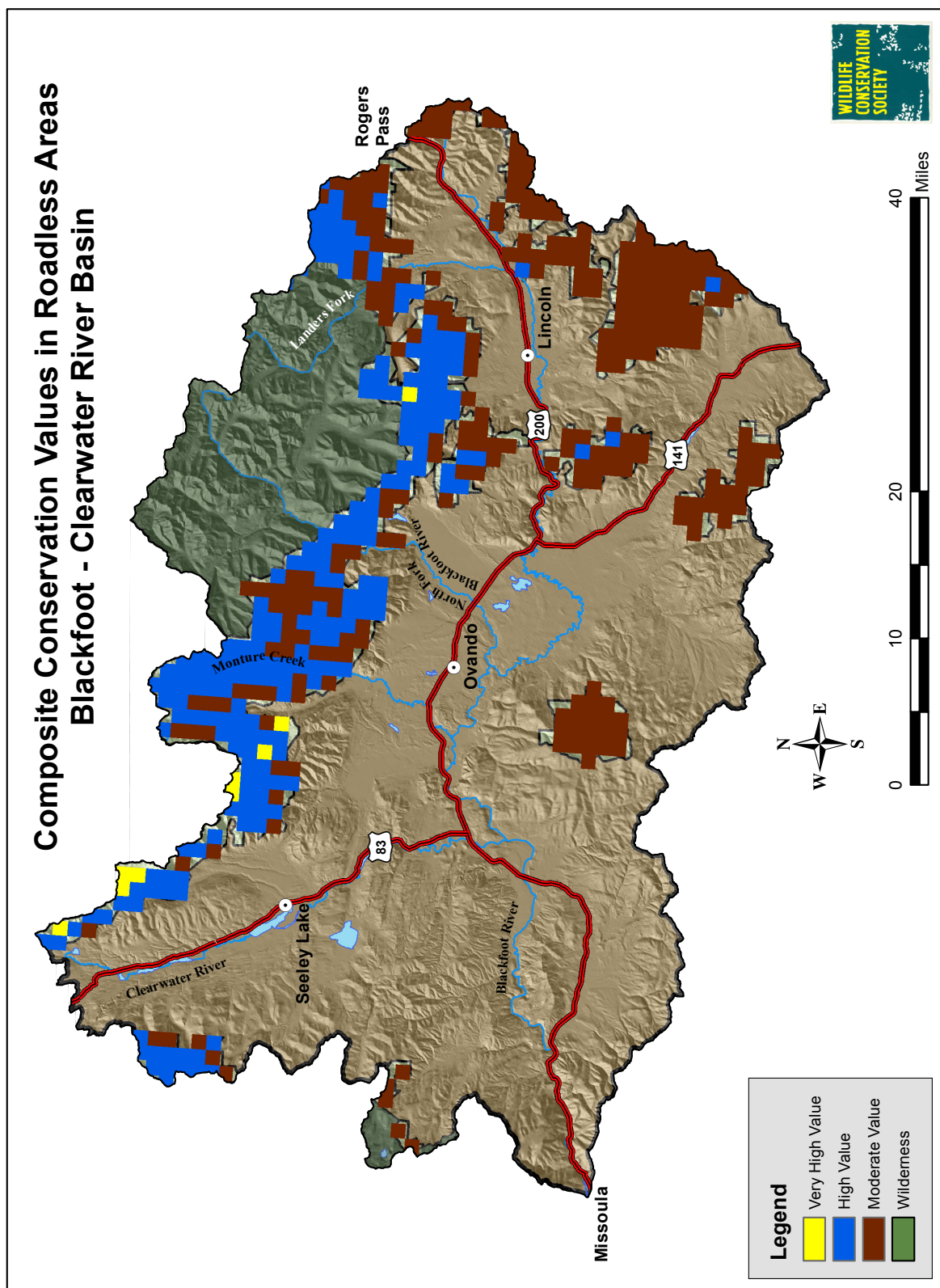
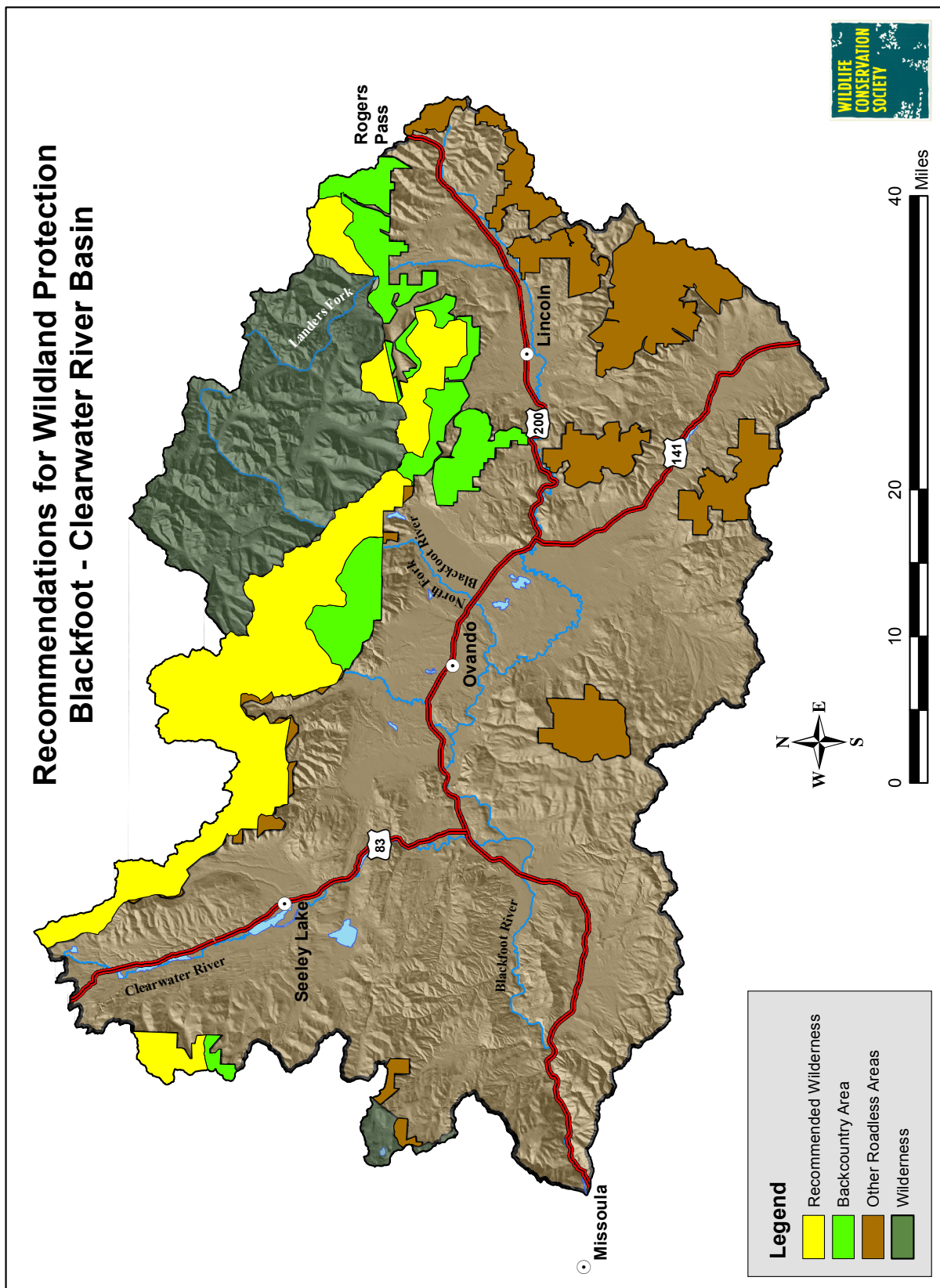


Figure 20. Recommendations for wildland protection, Blackfoot – Clearwater River Basin, Crown of the Continent Ecosystem, Montana.



6. SWAN RIVER AND SOUTHERN FLATHEAD RIVER BASINS



Montana FWP

The Swan River and Southern Flathead River Basin includes three major tributaries to Flathead Lake on the west side of the Crown of the Continent Ecosystem, Montana – the Swan River, the South Fork of the Flathead River, and the Middle Fork of the Flathead River. Diverse coniferous forests clothe the steep slopes, and exquisite jewels of tarn lakes are set among the rugged peaks and cirque basins. The Montana Legacy Project has secured protection of thousands of acres of corporate timber land in the Swan Valley. Agencies and citizens have been working hard to conserve key lands and vital connectivity across the valleys in this region. Some of the roadless areas are bordered by Glacier National Park, the Great Bear Wilderness, and the Bob Marshall Wilderness. But roadless lands along the narrow northern crest of the Swan Range are perched between the agricultural Flathead Valley and Hungry Horse Reservoir. About 376,594 acres of roadless areas exist currently along the Swan Range and in the Southern Flathead River basin. What is the conservation value of these roadless lands for vulnerable fish and wildlife species?

Figure 27. Composite conservation values for suite of vulnerable fish and wildlife species, Swan River and Southern Flathead River Basin, Crown of the Continent Ecosystem, Montana.

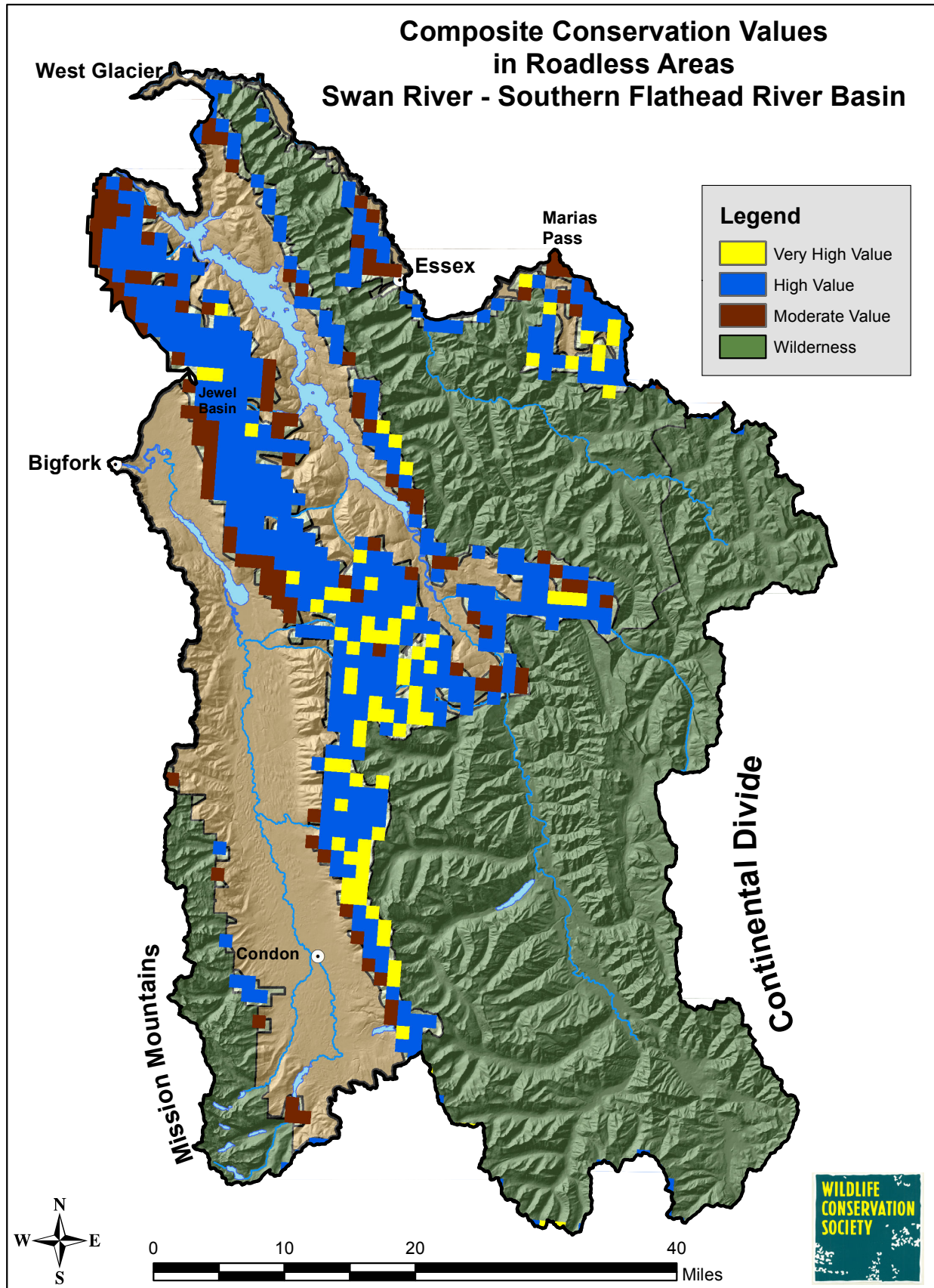
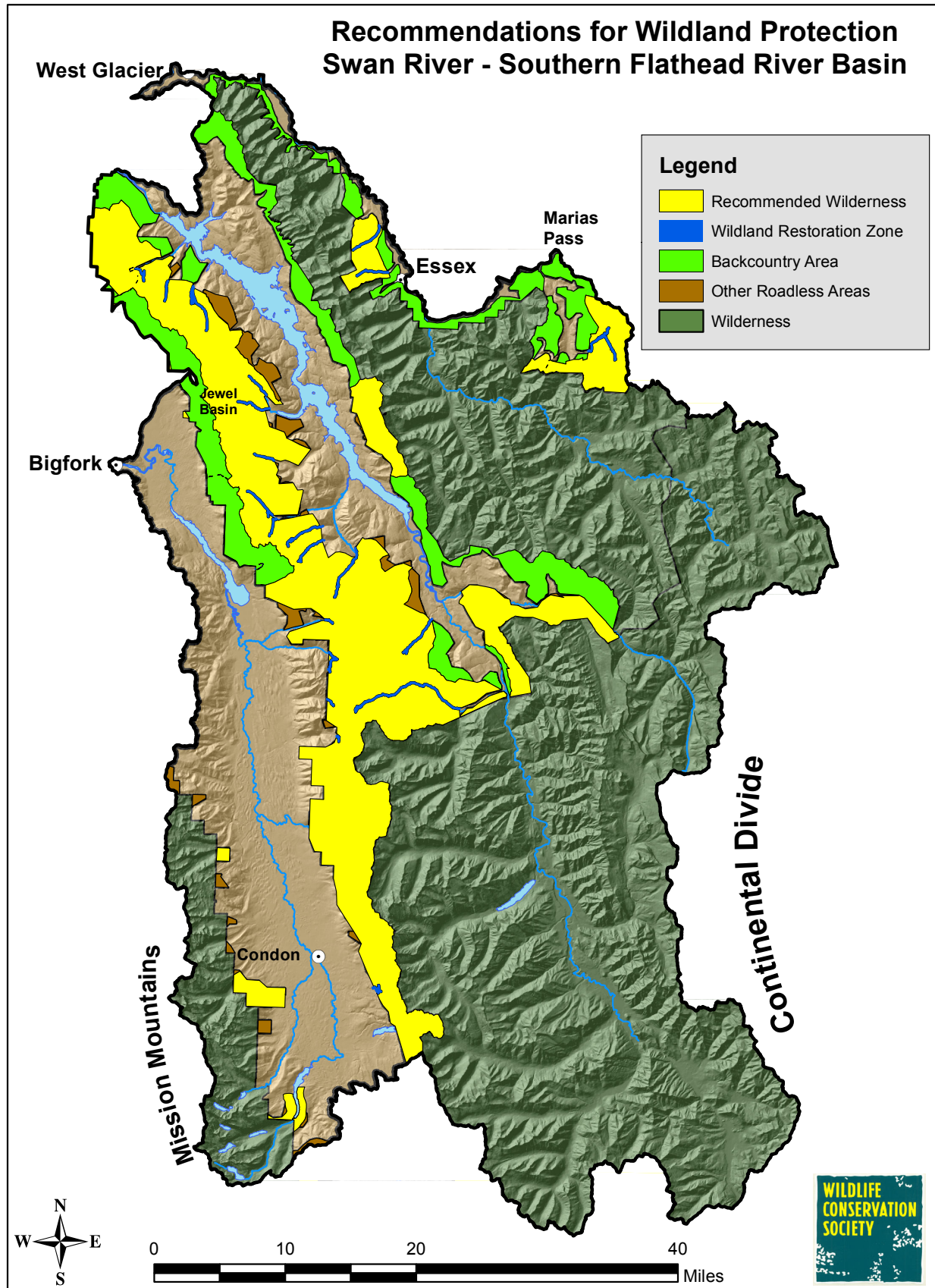
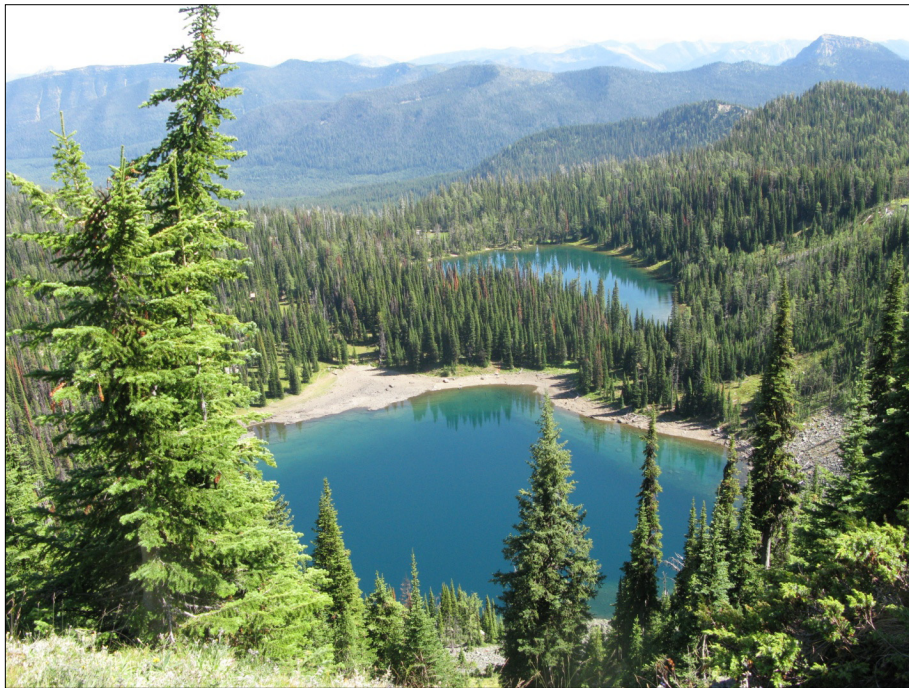


Figure 28. Recommendations for wildland protection, Swan River and Southern Flathead River Basin, Crown of the Continent Ecosystem, Montana.



7. NORTH FORK FLATHEAD RIVER BASIN AND TEN LAKES AREA



John L. Weaver

The North Fork Flathead River Basin and Ten Lakes roadless area drapes over the Whitefish Range along the western edge of the Crown of the Continent Ecosystem in Montana. The North Fork Flathead River begins in British Columbia and meanders southward through a broad basin and across the international border, marking the west boundary of Glacier National Park. A mix of roadless and logged Forest Service lands occurs west of the Flathead River. International concern and attention to conservation issues in this critical trans-boundary watershed have increased markedly in recent times. The Ten Lakes Scenic Area is the centerpiece of a roadless area on the west side of the Whitefish Range. Approximately 272, 443 acres of *roadless* lands exist currently in the North Fork Flathead River Basin and Ten Lakes area. What is their conservation value for vulnerable fish and wildlife species?

Figure 34. Composite conservation values for suite of vulnerable fish and wildlife species, North Fork Flathead River Basin and Ten Lakes area, Crown of the Continent Ecosystem, Montana.

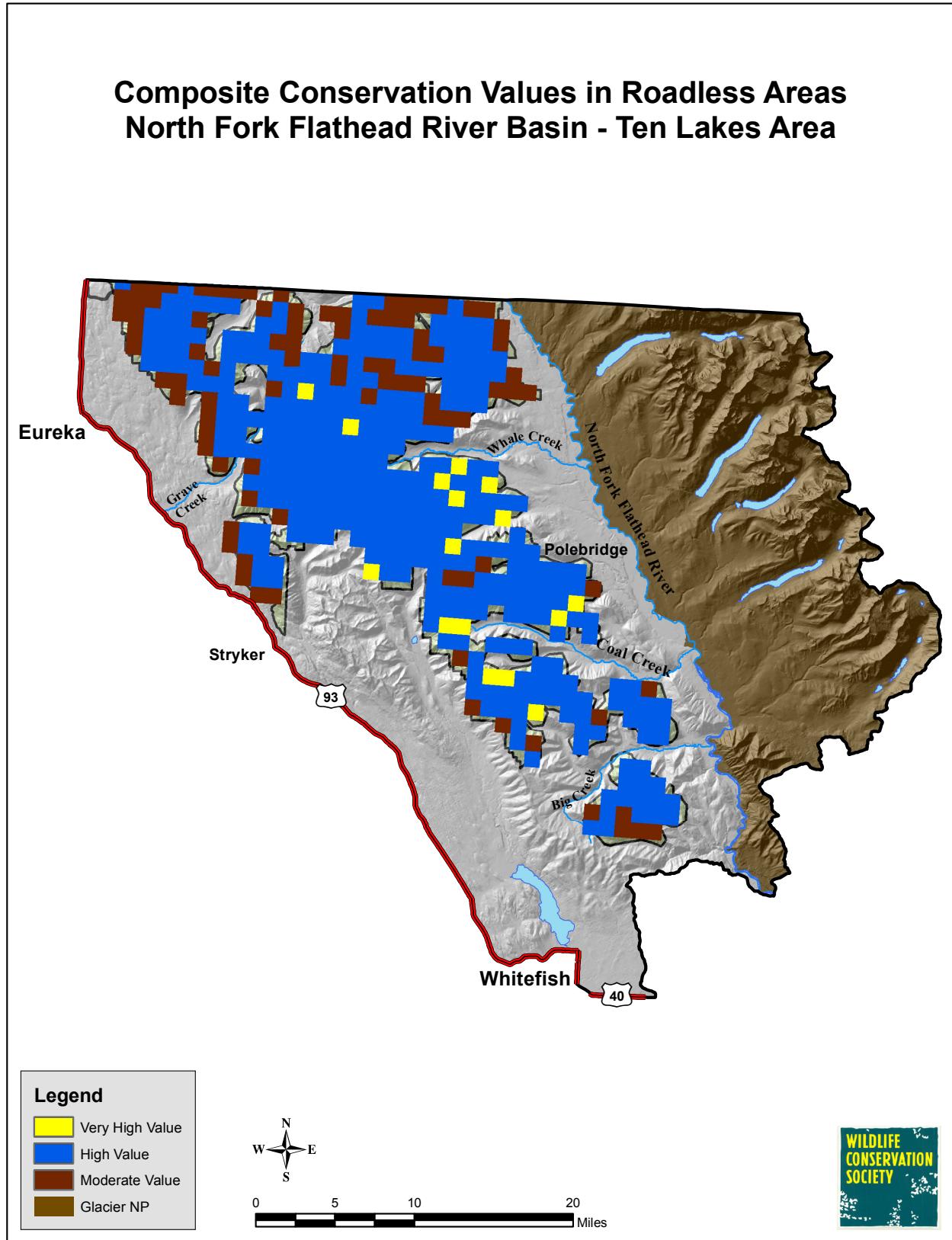
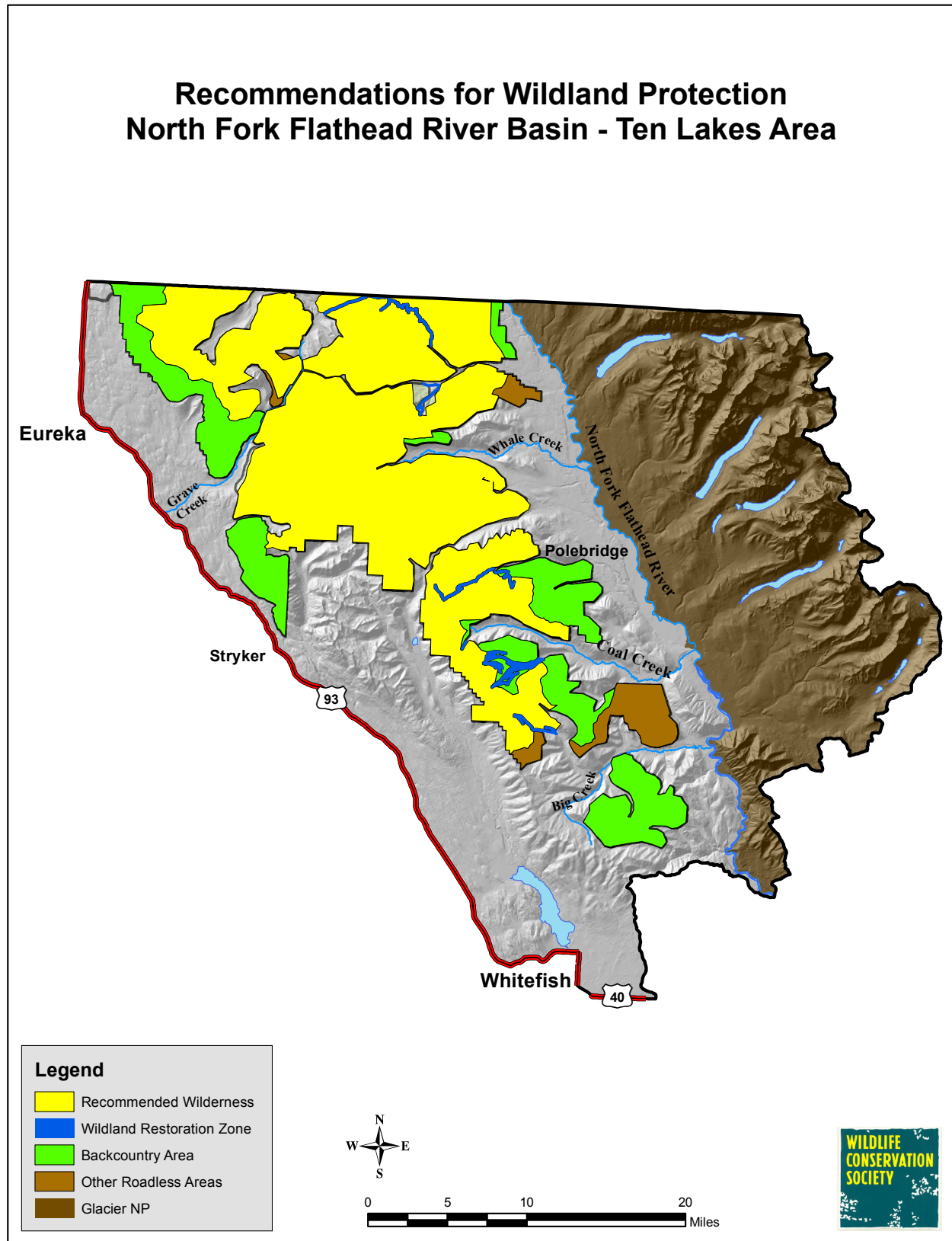


Figure 35. Recommendations for wildland protection, North Fork Flathead River Basin and Ten Lakes area, Crown of the Continent Ecosystem, Montana.



8. CROWN OF THE CONTINENT ECOSYSTEM: COMPLETING THE LEGACY OF CONSERVATION

Synthesis of Conservation Values across the Crown of the Continent Ecosystem, Montana

In this assessment, I have examined the conservation value of remaining roadless areas for vulnerable fish and wildlife species in various regions around the Crown of the Continent Ecosystem in Montana. Now, let's zoom out a bit and view these roadless lands and waters from the vantage of the entire Crown ecosystem for a larger perspective (see Appendix A for maps of conservation values for each species).

The waters of the Flathead River basin provide the cold, clean, complex and connected habitat that is critical for native bull trout, a threatened species (Appendix A1). Indeed, the Flathead River basin is widely acknowledged to be a stronghold for bull trout in the American West. Although several of these critical waters occur in existing Wilderness or Glacier National Park, many other streams designated as critical habitat begin or flow through roadless areas. As the Crown's climate continues to warm, tributaries will provide the best likelihood of remaining sufficiently cold for bull trout – especially those in the roadless headwaters of the Swan Range, Whitefish Range, and upper Blackfoot River basin.

The status assessment for native westslope cutthroat trout in the western United States revealed that 49% of the remaining 'conservation populations' occur in roadless areas on US Forest Service lands (Shepard et al. 2005). The network of cold-water streams throughout the Crown of the Continent Ecosystem provide a stronghold for remaining genetically-pure populations of westslope cutthroat trout, too (Appendix A2). Hybridization with non-native trout (particularly rainbow trout), however, threatens the genetic integrity of many westslope cutthroat populations. Because climate warming will favor the

spread of non-native trout at lower elevations, the higher tributaries will offer the most likely refugia for this cold-water native species. In the larger perspective, cold and clean streams in the South Fork, Middle Fork, and upper North Fork of the Flathead River will become even more important for westslope cutthroat trout.

The largest population of grizzly bears in the lower 48 states thrives on a variety of foods in habitats that reach from valley to mountain peak across the Crown of the Continent Ecosystem. Relatively higher densities of grizzlies occur in the northern and central sections of the Crown where habitats are most productive (Appendix A3). Roadless areas provide additional security for grizzly bears from human disturbance and mortality to support a robust population. Roadless lands along the Rocky Mountain Front (including Badger-Two Medicine), Swan Range, and Whitefish Range are integral for sustaining the wide-ranging movements of grizzly bears, now and into a future of varying conditions.

The largest population of the rare wolverine in the conterminous United States roams the rugged terrain of the high country across the Crown of the Continent Ecosystem in Montana. Primary habitat appears to be widespread across the Crown, but maternal habitat is more limited to the higher ridges and cirque basins (Appendix A4). Because the distribution and ecology of wolverines appears strongly linked to areas characterized by persistent snow cover (Copeland et al. 2010), climate warming may diminish suitability of habitats at lower elevations. Many of the remaining roadless areas in the Crown provide habitat in the high country that will help sustain the unique niche of this elusive carnivore.

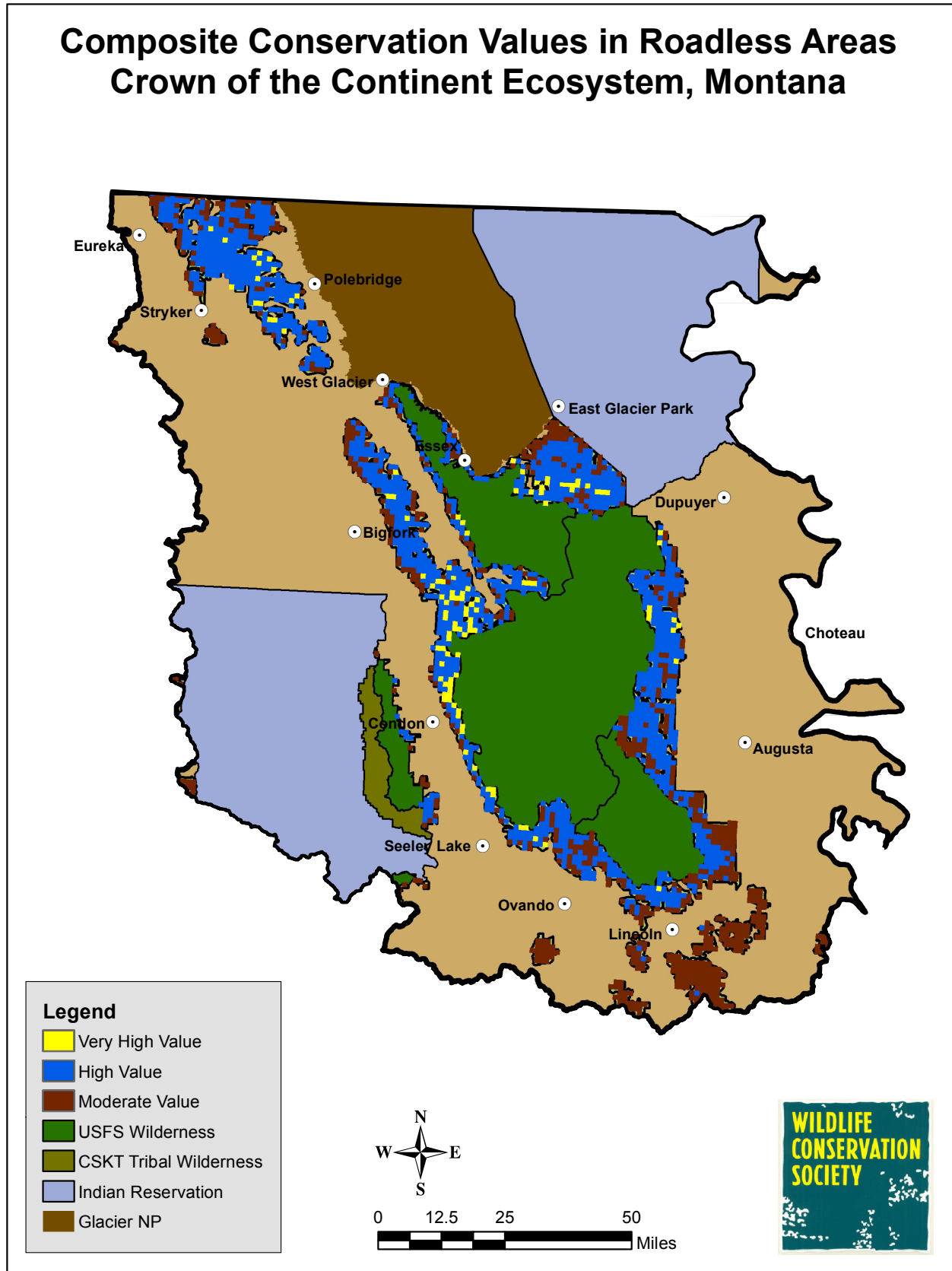
Mountain goats still occupy the same bands of remote cliffs where their ancestors stood sentinel in the past (Appendix A5). In some areas, goat populations have decreased due (in part) to excessive hunting facilitated by new roads and easier access. On many of the narrow crests and peaks, goats may rest on ledges inside a Wilderness area but find their scant forage on the roadless side of the ridge. Roadless areas with traditional maternal goat range, particularly in the Badger-Two Medicine and along the southern Swan Range, have high conservation value for this vulnerable species.

Some of the largest herds of bighorn sheep in America inhabit the spectacular rocky reefs and wind-swept, montane grasslands along the Rocky Mountain Front (Appendix A6). Much of their traditional winter range and summer range occurs in roadless areas there.

Several roadless areas serve as traditional summer range where elk birth and raise their calves, including: the Badger-Two Medicine area along the Rocky Mountain Front, upper Monture Creek in the Blackfoot River basin, upper Bunker Creek-Sullivan Creek and east of Hungry Horse Reservoir in the South Fork of the Flathead, and upper Granite Creek in the Middle Fork of the Flathead River basin.

The majority of remaining roadless lands in the Crown of the Continent Ecosystem scored **very high** (5.2%) or **high** (61.0%) in *composite* conservation value for this suite of vulnerable fish and wildlife species (Figure 36). Very-high conservation values were concentrated in the Badger-Two Medicine area on

Figure 36. Composite conservation values in roadless areas for suite of vulnerable fish and wildlife species, Crown of the Continent Ecosystem, Montana.



the Rocky Mountain Front, central and southern sections of the Swan Range, and a few places in the North Fork Flathead River basin. High conservation values were found in roadless areas throughout the Crown. Roadless lands with moderate value (33.8%) occurred at lower elevations closer to roads and in the isolated blocks south of Hwy 200 in the Blackfoot River basin.

The Crown of the Continent Ecosystem in Montana is truly one of the last, best places for these vulnerable fish and wildlife species. Moreover, the Crown ecosystem offers a notable range of future options for plants and animals to shift and persist during climate change due to: (1) its tremendous range-of-elevation, (2) diverse topography and aspect, and (3) 150-mile latitudinal distance south to north. Hence, the Crown of the Continent Ecosystem has the potential for robust resiliency to climate change compared to other areas. But such advantageous resiliency can be fully realized only if fish and wildlife have room to move unfettered across large, connected landscapes.

Summary of Recommendations for Wildland Protection

Based upon a thorough spatial assessment of conservation values for vulnerable fish and wildlife species on remaining roadless lands in the Crown of the Continent Ecosystem, I recommend that (Table 6, Figure 37):

- ✓ 887,461 acres (66.5%) be legislated as **Wilderness**,
- ✓ 310,320 acres (23.2%) be designated as Backcountry, and
- ✓ 82 miles of old, primitive logging roads be restored to natural condition for wildlife security.

Table 6. Amount of roadless areas (ac) recommended for Wilderness and other conservation designation for each of the sub-regions across the Crown of the Continent Ecosystem, Montana.

Category	Rocky Mountain Front		Blackfoot-Clearwater River Basin		Swan River and Southern Flathead River Basin		North Fork Flathead River Basin		TOTAL	
	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%
Wilderness	306,288	78.9	134,159	45.0	253,554	67.3	193,460	71.0	887,461	66.5
Backcountry	81,218	20.9	58,930	19.8	106,286	28.2	63,890	23.5	310,324	23.2
WRZ ¹	290	0.1	-	-	1,569	0.4	2,025	0.7	3,884	0.3
Other	364	0.1	104,742	35.2	15,185	4.0	13,068	4.8	133,359	10.0
TOTAL	388,160	100.0	297,831	100.0	376,594	99.9	272,443	100.0	1,335,028	100.0

¹Wildland Restoration Zone

For roadless lands recommended for Wilderness, I propose the following additions to existing units:

- ≈ 407,083 acres would be added to the Bob Marshall Wilderness,
- ≈ 173,602 acres to Great Bear Wilderness,
- ≈ 98,928 acres to Scapegoat Wilderness, and
- ≈ 14,391 acres to Mission Mountains Wilderness.

The 193,460 acres recommended for wilderness in the North Fork Flathead River basin and Ten Lakes area would comprise a separate unit, which some have suggested be named the ‘Winton Weydemeyer Wilderness’ after an early advocate of wildland protection for that area.

In conclusion, I have examined the conservation value of remaining roadless areas in the Crown of the Continent Ecosystem through the lens of a set of vulnerable fish and wildlife species. And I have found that the majority of these lands provide high to very high conservation values. Protecting these wildlands will secure habitats for year-round ranges, safeguard genetic integrity, enhance connectivity, and provide options for movement in response to changing conditions for these vulnerable species.

Completing the Legacy

Why is protecting more wildlands important?

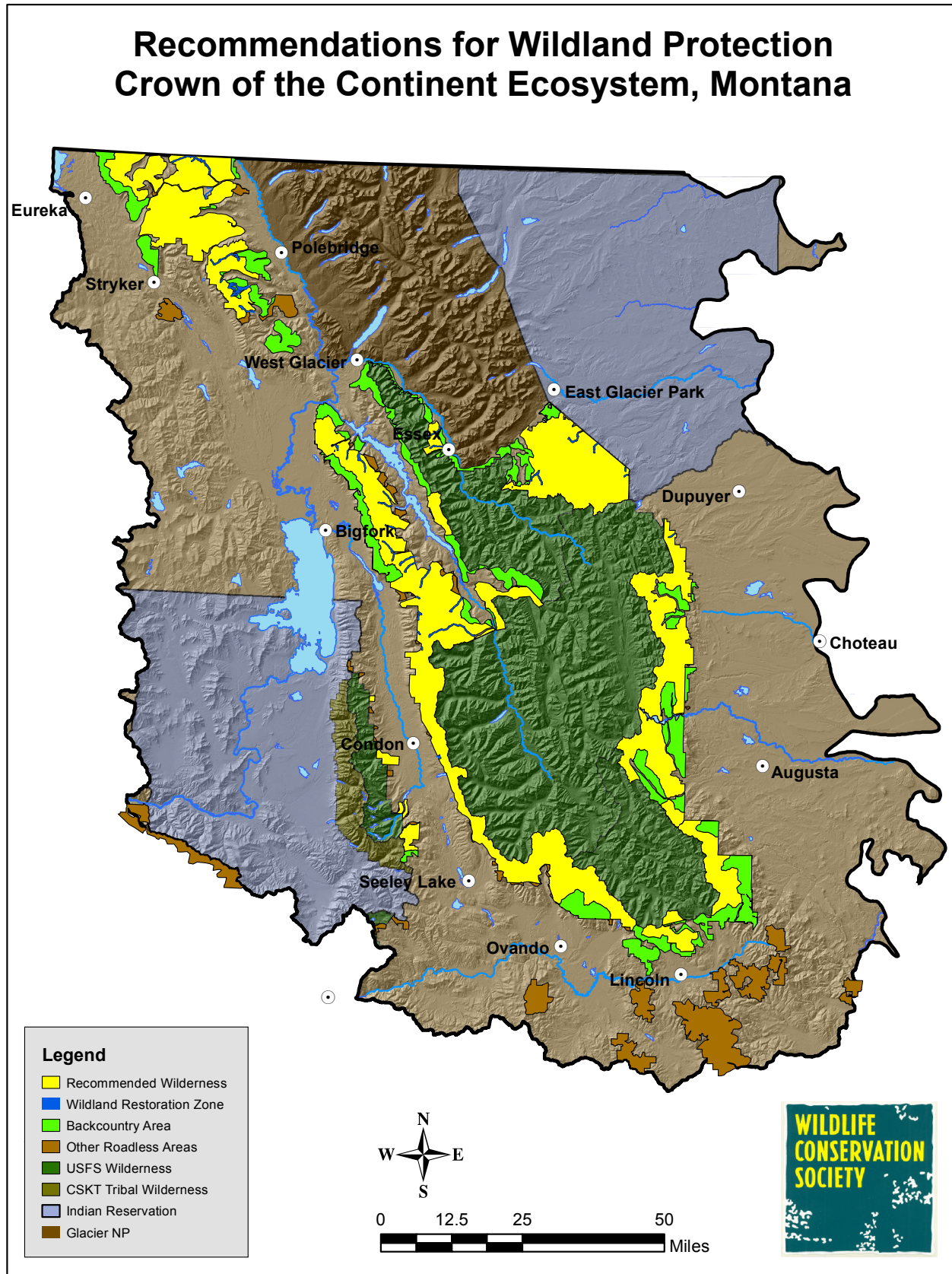
In the view of the eminent ecologist Aldo Leopold, the overall goal of conservation was to preserve the *health of the land* (Leopold 1949). By ‘land’, Leopold meant the soils, waters, plants, and animals - in other words, the ecosystem. By ‘health’, he meant the capacity of the land for self-renewal ... its resiliency in the face of change. Leopold believed that health of the land depended upon its ecological integrity ... its *wholeness* in terms of native species, collective functioning of integral parts, and intact complexity of ecological interactions. Leopold saw a beauty in the glow of healthy land ... especially lands that retained their natural integrity. Here, the scientist Leopold reflected the poetry of Robinson Jeffers (1938):

“Integrity is wholeness,
the greatest beauty is organic wholeness,
The wholeness of Life and things, the divine beauty of the universe.”

Thus, Leopold – as one of the original founders of the wilderness movement in America – envisioned the role of protected wilderness as critical in the larger concept of conservation. Wilderness was one strategic asset in a larger portfolio of conservation investments that ranged from farms to parks.

Leopold also believed that wilderness possessed great cultural value for people. In a deep sense, wild lands remind us of the natural environments that comprised the ancient crucible of humanity. In the modern scene, wilderness offers quiet respite from the pressures and adsorption of contemporary living ... a place that yields a cultural harvest of things “natural, wild and free” (Leopold 1949).

Figure 37. Recommendations for wildland protection, Crown of the Continent Ecosystem, Montana.



Many people – past and present, young and old, Montanans and others – share a similar feeling about things natural, wild and free. Over the past century, citizens and government leaders have worked hard to protect the splendid Crown of the Continent Ecosystem in Montana. It was a remarkable legacy and great gift. Yet, in the face of new information and new challenges, it may not have been enough. Today, more than 1.3 million acres remain roadless ... wild places where

native trout find the way back to their birth stream to spawn in the clean, cold waters of the Rockies ...

a mountain goat climbs the narrow ledges of a cliff that cleaves the sky ...

herds of bighorn sheep nibble short grasses with the roar of chinook winds and eagle wings in their ears ...

a mother grizzly bear and her cubs savor sweet huckleberries sprouted in soils enriched by the ashes of a wildfire half a century ago ...

a wolverine lopes across a snow-filled subalpine basin in its undaunted search for something to eat along the ragged edge of Nature's food web ...

the wild challenge of a bull elk trumpets across a September sunrise.



Milo Burcham

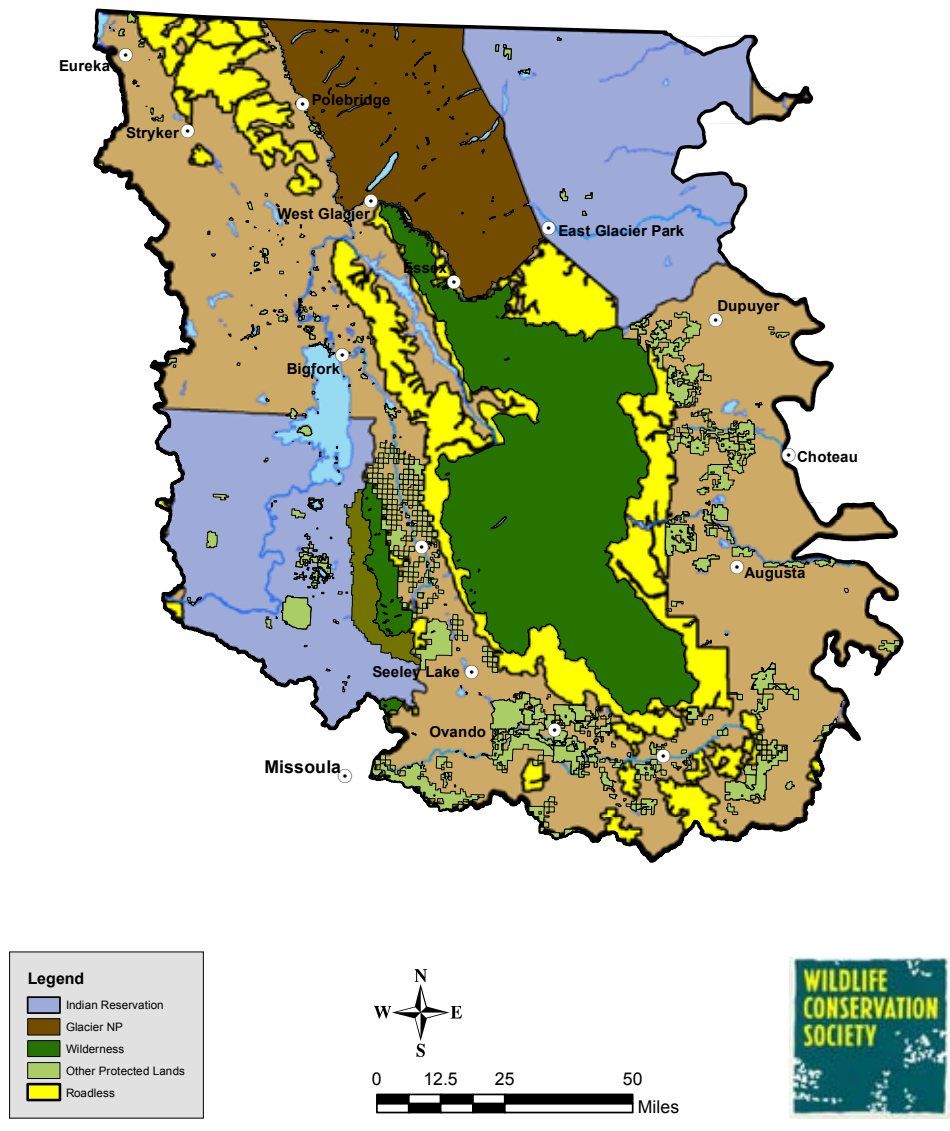


Rick and Susie Graetz

Here lays a rare opportunity to complete the legacy of conservation
in the Crown of the Continent Ecosystem in Montana and
to sustain the wild heartbeat of Life for present and future generations.

Crown of the Continent Ecosystem, Montana

Let's Complete the Conservation Legacy



Over the past 100 years, previous generations of citizens and Congressional leaders worked hard to protect the central wildlands of the spectacular Crown of the Continent Ecosystem in Montana as National Parks and Wilderness. Private landowners, conservation organizations, and the State of Montana have also teamed up to safeguard crucial habitat for fish and wildlife on surrounding lands. This was a great gift and remarkable legacy. Yet, 1.3 million acres (shown in yellow) remain roadless today. Many of these lands and waters have very high conservation value for a suite of vulnerable fish and wildlife – including bull trout, westslope cutthroat trout, grizzly bear, wolverine, mountain goat, and bighorn sheep. This is a rare opportunity to complete the legacy of conservation for present and future generations.



Wildlife Conservation Society
2300 Southern Boulevard
Bronx, NY 10460
Tel: 718-220-5100
www.wcs.org