Appendix Q: Biological Assessment (Bull Trout) Grant-Kohrs National Historic Site

National Park Service
U.S. Department of the Interior

Grant-Kohrs Ranch National Historic Site
Deer Lodge, Montana

I.

Northern Rocky Mountains Invasive Plant Management Plan / Environmental Assessment

Fisheries Biological Assessment and Evaluation

2011

Fisheries Biological Assessment and Evaluation
Grant-Kohrs National Historic Site, Deer Lodge, Montana

Project Name: Northern Rocky Mountains Invasive Plant Management Plan / Environmental Assessment

The following Biological Assessment (BA) is designed to satisfy the Endangered Species Act (ESA) requirements of the U.S. Fish and Wildlife Service (USFWS) and the environmental review process of the National Park Service (NPS.) On July 10, 1998, USFWS listed the Klamath and the Columbia River bull trout population segments as threatened (63 FR 31647) and the species was listed as threatened for the coterminous United States on November 1, 1999 (64 FR 58909). The Clark Fork River including the area within Grant-Kohrs Ranch National Historic Site has recently been designated as critical habitat for bull trout (Federal Register Vol. 75, No. 200, Monday, October 18, 2010, pp. 63909). This BA consists of 10 parts:

1. Background/History
2. Description of the Action and Action Area
3. Listed species and Critical habitat in the action area
4. Environmental Baseline Conditions
5. Direct, Indirect, and Cumulative Effects
6. Potential Effects to Species Indicators and Habitat Indicators
7. Determination – Dichotomous Key for Making ESA Determination of Effects
8. Documentation of Expected Incidental Take
9. References Cited
10. Summary and Signature

1.0 BACKGROUND/HISTORY

The purpose of this Biological Assessment is to address the potential effects from the Northern Rocky Mountains Invasive Plant Management Plan / Environmental Assessment (NRM IPMP EA) prepared by the United States Department of Interior, National Park Service, Pacific West and Intermountain Regions on designated critical bull trout habitat within the Grant-Kohrs Ranch National Historic Site (GRKO) near Deer Lodge, Montana. The NRM IPMP EA has been prepared to satisfy the requirements of the National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, 42 U.S. C. 4321-4347, as amended), including the Council on Environmental Quality (CEQ) regulations found at 40 CFR 1500 - 1508 and other applicable laws, *Management Policies* (NPS 2006), the NPS NEPA compliance guidance handbook (Director's Order (DO)-12, *Conservation Planning, Environmental Impact Analysis, and Decision-making*) and management directives. The EA facilitates compliance with Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act, the Wilderness Act and other applicable laws enacted for the protection of the environment.

The project involves improved invasive non-native plant management at GRKO near Deer Lodge, Montana, as well as at 10 other national park units located in the Northern Rocky Mountains. At GRKO, it has the potential to impact the following ESA-listed species that occurs in the area: bull trout (*Salvelinus confluentus)* and its critical habitat.

The purpose of the NRM IPMP EA is to implement a long-term management plan to reduce the impacts of (or threats from) nonnative plants on native plant communities and other natural and cultural resources, including cultural landscapes. Plan components include management strategies and treatment options that can be tailored to fit individual park environments. The following needs are addressed in the EA:

- Northern Rocky Mountains parks lack flexible and documented invasive plant management processes, and do not fully take advantage of Integrated Pest Management (IPM) techniques and adaptive management to direct invasive plant management activities and to prioritize management actions, target plants and resources.

- The use of adaptive management would allow parks to manage new occurrences of nonnative invasive species as they arise and become pests.

- There are a variety of nonnative invasive plant management techniques currently used or that could be used in the future in the 10 parks. These treatment methods include cultural, manual/mechanical, biological, chemical (herbicides) and prescribed fire techniques. These treatments are used alone or in combination to manage nonnative invasive species. Improvement of the selection of treatment methods is needed to ensure that the parks are identifying and using effective methods that minimize adverse impacts on park natural and cultural resources.

- A plan would facilitate compliance with federal and state noxious weed laws and documentation of results through the Government Performance and Results Act (GPRA).

- Without an Invasive Plant Management Plan, it is difficult for parks to communicate and document their needs and objectives to park partners and to foster collaboration on plans and projects. Similarly the parks lack guidance to increase education and awareness about invasive plants for park staff and the public.

- The lack of an Invasive Plant Management Plan makes it difficult to integrate their internal processes, plans, activities and resources among parks and across divisions, regions and programs.

- There is currently limited coordination of monitoring to help the parks understand the status and effectiveness of nonnative plant management efforts or to assist in making better management decisions.

- Current invasive plant management practices and policies are not well documented and are unclear to park partners or the public.

2.0 Description of the Action and Action Area

The action area to be addressed under this BA includes all of GRKO lands and easements and other lands within or adjacent to the boundary of the park unit, if these actions involve the use of NPS resources and/or funding. Grant-Kohrs Ranch National Historic Site, an historic ranch, is located in the broad Deer Lodge Valley of the Clark Fork River in west-central Montana. Approximately 4.8 km of the upper Clark Fork River traverses the center portion of the park, south to north. The park was established in 1972, with the enabling legislation stating the park's purpose is to provide an understanding of the frontier cattle era of the Nation's history. In 1988 the original 216 acres was expanded to 1,618 acres. GRKO contains approximately 86 nonnative plant species. Of these, approximately 18 are currently targeted for treatment. In 2003, an invasive plant survey mapped 625 acres impacted by invasive nonnative plants at GRKO.

The NRM IPMP is intended to provide GRKO with a suite of tools to effectively treat invasive plants. Resource managers can then select the most appropriate treatment option or combination of treatments to reduce the impacts from and threats to the park from invasive plants. Two alternatives are considered for the NRM IPMP EA plan. For Alternative 1, GRKO would continue ongoing invasive plant management activities that have been implemented without a formalized comprehensive invasive plant management plan. For Alternative 2, invasive plant management treatment methods would likely be similar to Alternative 1, but would be directed with a comprehensive plan. For the purposes of the BA, impacts associated with Alternative 2 will be analyzed.

The following treatments will be used for Alternative 2 and impacts will be analyzed for:

- Cultural: practices that reduce opportunities for invasive plants to occur and allow for the continued growth and spread of native plants. Examples include using clean fill in construction and seeding historically appropriate species.
- Manual / Mechanical: practices that remove all or part of the invasive plant. Examples include hand-pulling, cutting, grubbing, haying and mowing.
- Biological: the practice of using the natural enemies of plants (such as insects, fungi, or livestock) to control them. Examples include the use of plant feeding insects or livestock grazing to control invasive plants. Biological control methods are used only when the agent is host-specific and has a negligible risk of becoming a pest itself. Insect biological control methods are approved by the Agricultural Plant Health Inspection Service (APHIS), an agency within the U.S. Department of Agriculture (USDA).
- Chemical: the practice of applying herbicides according to their approved label uses. Examples of application methods include backpack spraying, spot treatment (stump painting) and aerial application using fixed wing aircraft or helicopters. Pesticide use is approved by NPS regional and/or national coordinators.
- Prescribed Fire, including Flaming: the practice of using fire in certain areas under specific conditions to reduce the growth of invasive plants. The use of prescribed fire must also be identified in approved park Fire Management Plans.

Neither Alternative has specified an annual target number of acres for each treatment, but the following overview of past actions (Alternative 1) provides a scale similar to what treatments will be for Alternative 2.

Alternative 1 - No Action (Continue Current Management)
GRKO would continue an ongoing program as follows:

Noxious weed management has been implemented through an IPM approach at GRKO since in 1985. IPM strategies have included mapping and monitoring, hand-pulling, mowing, biocontrol, livestock grazing, herbicide application, and cooperation in a cooperative weed management area. The following invasive species (12 State of Montana designated) have been high priorities for treatment:

Table BA-1. Grant-Kohrs Ranch NHS High Priority Species

Common Name	Scientific Name
Yellow toadflax	*Linaria vulgaris*
Leafy spurge	*Euphorbia esula*
Canada thistle	*Cirsium arvense*
Spotted knapweed	*Centaurea maculosa*
Cheatgrass	*Bromus tectorum*
Field bindweed	*Convolvulus arvensis*
Perennial pepperweed	*Lepidium latifolium*
Hoary cress	*Cardaria draba*
Russian Knapweed	*Acroptilon repens*
Houndstongue	*Cynoglossum officinale*
Common tansy	*Tanacetum vulgare*
Tall buttercup	*Ranunculus acris*
Sulfur cinquefoil	*Potentilla recta*

Baby's breath	*Gypsophila paniculata*
Kochia	*Kochia scoparia*

Less than 1 acre of invasive plants is controlled annually through hand pulling. Biocontrol agents were released as early as 1985 on spotted knapweed at GRKO and were continued to be released during the 1990's. Surveys in 2008 and 2009 indicated biocontrol agents were present and well established on spotted knapweed, leafy spurge, and yellow toadflax. GRKO successfully collaborated with Utah State University in 2004 and 2005 to train park livestock (cattle) to eat weeds. The cattle assisted with controlling spotted knapweed, Canada thistle, and some leafy spurge on more than 300 acres in 2004. The trained cattle are currently being evaluated to understand their preference for invasive species. Prior to 2003, herbicide treatment was implemented through contract commercial applicators including ground and aerial application as well as appropriately licensed resource staff. In 2003, the Northern Rocky Mountain Exotic Plant Management Team (NRM EPMT) began treating the invasive nonnative plants at GRKO and has continued to present. The following table provides an annual summary of the herbicides used and the acres treated at GRKO by NRM-EPMT.

Table BA-2. Grant-Kohrs Ranch NHS Herbicides Used and Acres Treated

Year	Herbicides Used (Common Names)	Acres Treated
2005	2,4-D Amine 4, Curtail, Escort, Redeem R&P, Tordon 22K, Transline	43.3
2006	2,4-D Amine 4, Curtail, Escort, Plateau, Milestone, Redeem R&P, Roundup Ultra, Tordon 22K	212.8
2007	Curtail, Escort, Milestone, Plateau, Roundup Pro, Tordon 22K	190.7
2008	Escort, Milestone, Plateau, Roundup Pro, Telar XP, Tordon 22K	124.2
2009	Escort, Gly Star Pro, Matrix, Milestone, Plateau, Telar XP, Transline	22.3

The average number of acres treated with herbicides per year from 2005-2009 is 118.7. NRM EPMT estimates that since 2003, that they have reduced infestations of spotted knapweed, babysbreath, and hoary cress by 95 percent.

The riparian area (approx 122 acres) along the Clark Fork River that surrounds the critical bull trout habitat was fenced in 1994 due to Superfund related contamination concerns and to protect the vegetation and river banks from grazing impacts. In 2006, approximately 81 acres of large, dense infestations of leafy spurge and yellow toadflax were treated with Plateau herbicide in and immediately adjacent to the riparian area. In 2007, 115 acres of this same area was addressed along with infestations of Russian knapweed and Canada thistle. In 2008, 2009, and 2010, 54 acres, 16 acres and 8.5 acres respectively of leafy spurge and yellow toadflax were treated in the riparian area with Plateau and Telar XP herbicide. Milestone herbicide has also been used to address Canada thistle. Application rates used for Plateau, Telar XP, and Milestone followed pesticide label recommendations of 12, 1.5, and 6 ounces per acre respectively. In 2005 and in 2010, small plots of leafy spurge (<1 acre) were grazed with cattle to evaluate their preference for the weed. These plots were temporarily fenced, cattle were in each plot less than one week, and water was supplied via an offstream source or with limited access to the river. For Alternative 2, riparian treatment strategies similar in trend (to 2009 and 2010) and scale (acres treated, herbicides used and application rates) would likely continue to be implemented. No prescriptive fire use for invasive plant management has been used in the riparian area.

Most actions have been implemented without a comprehensive invasive plant management plan.

Alternative 2 – Implement Comprehensive Invasive Plant Management Program (Preferred)

Treatment actions proposed under Alternative 2 are likely to be similar in scale to treatments described in Alternative 1, but directed with a comprehensive plan. Unlike Alternative 1, this alternative is a comprehensive proposal that includes the following elements for the management of invasive plants that would be systematically implemented by GRKO:

9) Prevention and Early Detection;
10) Implement Seven Step Decision-Making Tool;
11) Recordkeeping;
12) Interpretation / Education;
13) Partnerships;
14) Adaptive Management;
15) Measures to Avoid, Minimize or Mitigate Impacts; and
16) Consistency Analysis for Site Specific Plans.

Under this alternative, GRKO would identify high priority invasive species for treatment; determine what treatments are feasible to reduce the number of or population of plants; identify the most reasonable management strategy or strategies; and then select the most appropriate treatment option or combination of treatments to minimize potential impacts and maximize overall management success. To do this GRKO would use a systematic, documented and comprehensive methods and analysis through a new 7-Step Decision-making Tool outlined as follows:

Step 1: Identify Nonnative Plants;
Step 2: Determine Whether Nonnative Plant Meets Action Thresholds;
Step 2a: Monitor to Determine Whether Nonnative Species is Invasive;
Step 3: Identify Species Management Priorities;
Step 4: Identify Area Management Strategy and Evaluate and Select Treatment Method(s);
Step 5a: Confirm Compliance for Chemical and/or Biological Treatment Method(s);
Step 5b: Confirm Compliance with NEPA (including NHPA, ESA, CWA, etc.);
Step 6: Implement Selected Treatment(s); and
Step 7: Monitor Treatment to Assess Control Efficacy.

By employing a more effective process (the 7-Step Decision-making Tool), GRKO would systematically identify nonnative invasive plants and their characteristics to determine which plants are the highest priorities for treatment. Although this list could vary from year to year based on several variables, the ability to use the Alien Plant Ranking System (APRS) and a collaborative set of resource-based criteria to identify the park's highest priorities would ensure that those species that pose the greatest threats would be identified and potentially targeted for treatment. Whether or not these species were actually treated would depend on the availability of successful treatment methods, funding, staffing and other operational factors. Combined, the ability to identify the highest priority plants and additional knowledge provided by the plan associated with treatment methods would have a long-term beneficial effect on reducing the incidence and spread of nonnative invasive plants.

Alternative 2 would also allow for adaptive management. Herbicides with similar or less toxicity and fewer environmental effects would be used to treat nonnative invasive plants as these were developed and approved as non-restricted use herbicides and subsequently approved through the Pesticide Use Proposal (PUPs) system by NPS regional or national IPM Coordinators. The ability to use a wider range of herbicides as these were developed and tested and proven successful would have a long-term beneficial effect on decreasing weed abundance and fewer effects from treatment with less weed resistance would occur from herbicide use.

In Alternative 2, increased monitoring would improve the effectiveness of the invasive plant management program by helping to direct efforts where they are most effective, a long-term beneficial effect. There would also be greater emphasis on combining treatments with rehabilitation or restoration where possible. This would minimize the opportunities for additional invasion or spread of nonnative invasive plants in treated areas, a long-term beneficial effect.

GRKO would apply the impact avoidance, minimization and mitigation measures specified in NRM IPMP EA Chapter 3 and in the environmental consequences section for each applicable resource as applicable to protect cultural and natural resources (Special Status Species) and the quality of the visitor experience. (Note: These are also summarized in the NRM IPMP EA Appendix K.)

3.0 Listed species and Critical habitat in the action area

BULL TROUT

Description. Bull trout and Dolly Varden (*Salvelinus malma Girard*) were both formerly known as Dolly Varden (*Salvelinus malma Walbaum*). In 1991 they were recognized as two distinct species. Bull trout have an elongated body that is somewhat rounded and slightly compressed laterally, and covered with cycloid scales numbering 190-240 along the lateral line (Brown 1971). The mouth is large with the maxilla extending beyond the eye and with well developed teeth on both jaws and head of the vomer (none on the shaft). Bull trout have 11 dorsal fin rays, 9 anal fins, and the caudal fin is slightly forked. Although they are often olive green to brown with paler sides, color is variable with locality and habitat. Their spotting pattern is easily recognizable showing pale yellow spots on the back, and pale yellow and orange or red spots on the sides. Bull trout fins are tinged with yellow or orange, while the pelvic, pectoral, and anal fins have white margins. Black markings are absent on the fins (USFWS 1998).

Historical and Current Distribution. The historical range of bull trout was restricted to North America (Cavender 1978). Bull trout have been recorded from the McCloud River in northern California, the Klamath River basin in Oregon and throughout much of interior Oregon, Washington, Idaho, western Montana, and British Columbia, and extended into the Hudson Bay Drainage (USFWS 1998).

Bull trout are now extinct in California and only a small population still exists in the headwaters of the Jarbidge River, Nevada which represents the present southern limit of the species' range. Bull trout are known or predicted to occur in 45 percent of watersheds in the historical range and to be absent in 55 percent (USFWS 1998).

Bull trout are present in the upper reaches of Warm Springs Creek and Flint Creek, tributaries at the upstream extent of this section of the upper Clark Fork River (75 CFR 63909). The Montana Department of Fish Wildlife & Parks (MDFWP 2002) recognizes the portion of the upper Clark Fork River crossing GRKO as a bull trout fishery. Before mining activity in the upper Clark Fork River, the potential for viable bull trout fishery was likely quite high. But pollution from toxic metals and sedimentation of streams by mining wastes greatly reduced habitat quality. Fish population surveys conducted between 1979 and 1983 encountered no bull trout at stations above and below park (Knudson 1984). In a September 3, 2010, phone conversation with MDFWP area fish biologist Jason Lindstrom, he indicated that no bull trout have been found in the upper Clark Fork River within or near the vicinity of GRKO. See Attached Figure, Critical Habitat for Bull Trout.

Life History Characteristics. Bull trout spawn from August through November. Hatching may occur in winter or early spring, but alevins may stay in the gravel for an extended period after yolk absorption (McPhail and Murray 1979). Growth, maturation, and longevity vary with environment. First spawning is often noted after age four, with individuals living 10 or more years (Rieman and McIntyre 1993).

Two distinct life-history forms, migratory and resident, occur throughout the range of bull trout (Pratt 1992; Rieman and McIntyre 1993). Migratory forms rear in natal tributaries before moving to larger rivers (fluvial form) or lakes (adfluvial form) or the ocean (anadromous) to mature. Migratory bull trout may use a wide range of habitats ranging from 2^{nd} to 6^{th} order streams which varies by season and life stage. Seasonal movements may range up to 300 km as migratory fish move from spawning and rearing areas into overwinter habitat in downstream reaches of large basins (Bjornn and Mallet 1964; Elle and others 1994). The resident form may be restricted to headwater streams throughout life. Both forms are believed to exist together in some areas, but migratory fish may dominate populations where corridors and subadult rearing areas are in good condition (Rieman and McIntyre 1993).

Due to the known presence of bull trout in the upper reaches of Warm Springs Creek at the upstream extent of the upper Clark Fork River, at least a portion of which are thought potentially represent the migratory life history form, there is further circumstantial evidence that migratory bull trout may temporarily or seasonally occur in this reach of the upper Clark Fork River (75 CFR 63909) which flows through GRKO.

Habitat Relationships. Bull trout appear to have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). Habitat characteristics including water temperature, stream size, substrate composition, cover and hydraulic complexity have been associated with the distribution and abundance (Dambacher and other, in press; Jakober 1995; Rieman and McIntyre 1993).

Stream temperatures and substrate composition may be particularly important characteristics of suitable habitats. Bull trout have repeatedly been associated with the coldest stream reaches within basins. Goetz (1994) did not find juvenile bull trout in water temperatures above 12.0°C. The best bull trout habitat in several other Oregon streams was where water temperature seldom exceeded 15°C (Buckman et al. 1992; Ratliff 1992; Ziller 1992). Temperature also appears to be a critical factor in the spawning and early life history of bull trout. Bull trout in Montana spawned when temperatures dropped below 9 to 10°C (Fraley and Shepard 1989). McPhail and Murray (1979) reported 9°C as the threshold temperature to initiate . Temperatures fell below 9°C before spawning began in the Metolius River, Oregon (Riehle 1993). Survival of bull trout eggs varies with water temperature (McPhail and Murray 1979). They reported that 0-20%, 60-90%, and 80-95% of the bull trout eggs from British Columbia survived to hatching in water temperatures of 8-10°C, 6°C, and 2-4°C, respectively. Weaver and White (1985) found that 4-6°C was needed for egg development for Montana bull trout. Temperature may be strongly influenced by land management (Henjum and others 1994) and climate change; both effects may play an important role in the persistence of bull trout.

Bull trout are more strongly tied to the stream bottom and substrate than other salmonids (Pratt 1992). Substrate composition has repeatedly been correlated with the occurrence and abundance of juvenile bull trout (Dambacher and others in press; Rieman and McIntyre 1993) and spawning site selection by adults (Graham and others 1981; McPhail and Murray 1979). Fine sediments can influence incubation survival and emergence success (Weaver and White 1985), but might also limit access to substrate interstices that are important cover during rearing and overwintering (Goetz 1994; Jakober 1995).

Key Factors. Watershed disruption is a factor that has played a role in the decline of bull trout. Changes in or disruptions of watershed processes likely to influence characteristics of stream channels are also likely to influence the dynamics and persistence of bull trout populations. Bull trout have been more strongly associated with pristine or only lightly disturbed basins (Brown 1992; Clancy 1993; Cross and Everest 1995; Dambacher and others, in press; Huntington 1995; Ratliff and Howell 1992).

Large quantities of flood-deposited tailings are present throughout the Deer Lodge Valley. These deposits were derived from exposed and easily eroded mine and smelter waste and tailings. They are enriched in arsenic, cadmium, copper, iron, manganese, lead, and zinc (Smith *et al.* 1998 in NPS GRKO 2007). All of these contaminated deposits lie within the extensive 100-year floodplain of the upper Clark Fork River.

Introduced species are another factor influencing bull trout. More than 30 introduced fish species occur within the present distribution of bull trout. Species such as brown, brook, and lake trout are thought to have depressed or replaced bull trout populations (Dambacher and others, in press; Donald and Alger 1992; Howell and Buchanan 1992; Kanda and others, in press; Leary and others 1993; Ratliff and Howell 1992). Brook trout are seen as an especially important problem (Kanda and others, in press; Leary and others 1993) and may progressively displace bull trout through hybridization and higher reproductive potential (Leary and others 1993). Brook trout now occur in the majority of the watersheds representing the current range of bull trout. Introduced species may pose greater risks to native species where habitat disturbance has occurred (Hobbs and Huenneke 1992).

In a fish inventory completed in 2002 at GRKO, the fish assemblages consist primarily of native species; five of six species captured were native. The six species captured were brown trout (*Salmo trutta*), largescale sucker (*Catostomus macrocheilus*), longnose sucker (*Catostomus catostomus*), mountain whitefish (*Prosopium williamsoni*), redside shiner (*Richardsonius balteatus*), and mottled sculpin (*Cottus bairdi*). However, in terms of numbers, the introduced brown trout is the most common species present (Bramblett 2002.) In addition to the six fish species captured, the State of Montana MFISH database lists an additional five species including brook trout (*Salvelinus fontinalis*) and rainbow trout (*Oncorhynchus mykiss*) as rare in abundance.

Isolation and fragmentation are other factors likely to influence the status of bull trout. Historically bull trout populations were well connected throughout the Basin. Habitat available to bull trout has been fragmented, and in many cases populations have been isolated entirely. Dams have isolated whole subbasins throughout the Basin (see for example, Brown 1992; Kanda and other, in press; Pratt and Huston 1993; Rieman and McIntyre 1995). Irrigation diversions, culverts, and degraded mainstem habitats have eliminated or seriously depressed migratory life histories effectively isolating resident populations in headwater tributaries (Brown 1992; Montana Bull Trout Scientific Committee, in preparation; Ratliff and Howell 1992; Rieman and McIntyre 1993). Introduced species like brook trout may also displace bull trout in lower stream reaches further reducing the habitat available in many remaining headwater areas (Adams 1994; Leary and others 1993). Loss of suitable habitat through watershed disturbance may also increase the distance between good or refuge habitats and strong populations thus reducing the likelihood of effective dispersal (Frissell and others 1993).

The likelihood of bull trout occupancy in the upper Clark Fork River has increased since 2008, as a result of the removal of Milltown Dam, which eliminated a barrier to bull trout migration in this reach.

4.0 Environmental Baseline Conditions

Bull trout populations. In preparing the January 14, 2010, reproposal (75 FR 2269), USFWS re-examined the record, including the State of Montana's MFISH database, and found that hard documentation of bull trout occupancy of the upper Clark Fork River reach over the last 20 years was lacking. However, the sampling was not comprehensive and USFWS acknowledged that low levels of undocumented bull trout occupancy likely occur in this lengthy stream reach. According to MFISH, the nearest sampled bull trout population is approximately 41 stream miles above GRKO in Warm Springs Creek.

Habitat Conditions. Because of the removal of Milltown Dam and the ongoing and planned habitat restoration actions, USFWS no longer believes that the primary constituent elements (PCEs) in the upper Clark Fork River are limiting to occupancy by migratory bull trout, on at least a seasonal basis. Based on comments and data USFWS received in response to their request for information in the January 14, 2010, reproposal (75 FR 2269), USFWS now finds PCEs present in this area and has determined that this area does meet the selection criteria and is essential for the conservation of the species. (75 CFR 63909)

The U.S. Geological Survey 12324200 Clark Fork gauging station at Deer Lodge MT is approximately one mile upstream of GRKO. At the station site, the drainage area is 995 square miles. June has the highest mean monthly discharge of 506 cubic feet per second (cfs) and August has the lowest monthly discharge of 105 cfs.

About 4.8 km of the upper Clark Fork River flows through GRKO, of which three reaches were inventoried for fish in August and September 2002. Sites were chosen based on available access points.

The upper reach was located near the southern boundary of GRKO and was 270 m in length. Stream width was about 8-12 m, depth range was 0.3-1.5 m, substrate ranged from silt to cobble, aquatic macrophytes and filamentous algae were common, and large woody debris was rare. The middle reach was located upstream of the bridge near the ranch buildings and was 300 m in length. Habitat conditions were similar to those described for the upper reach, although with slightly less diversity in depths and stream-flow velocities. The lower reach was located towards the northern boundary, near the Deer Lodge sewage ponds and was 300 m in length. Habitat conditions were similar to those in the upper and middle reaches; however, this reach was noticeable shallower and had less diversity in depths, substrates, and stream-flow velocities. (Bramblett 2002)

Water in the Clark Fork River is a calcium-bicarbonate-sulfate type, and major constituents are primarily derived from weathering of rock fragments in the alluvial fill except sulfate, which is released from oxidation of pyrite present in mine wastes. Arsenic, cadmium, copper, lead, manganese, and zinc, which are trace elements associated with mine wastes from historical mining activities, commonly were measured at detectable levels in the river. Nutrients in the river were mainly human-derived related to wastewater discharge and agriculture. Statistically significant downward trends were detected in dissolved calcium, sulfate, and zinc in the Clark Fork River that were attributed to remediation and restoration efforts during the 1980s and early 1990s. The Clark Fork River in the vicinity of GRKO has a beneficial-use classification of C-1 (suitable for bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply) and is listed as severely impaired for aquatic life and cold-water fishery and partially impaired for primary-contact recreational use. The sources of impairment are mine wastes, agriculture, and municipal wastewater discharge. (Mast 2007)

In a 4 year study titled, "Mercury, Selenium and other contaminants in osprey along the Upper Clark Fork River," osprey chicks' blood samples were collected and analyzed from 36 nests along the upper Clark Fork River, with one of the nests on GRKO. With fish being the primary food source of osprey, the purpose of the study was to determine if contaminants from the river (via fish) would bioaccumulate in the chicks. Blood concentrations of lead, zinc, copper and cadmium were not significantly different from values found in other sections of the Clark Fork River. Results did show that blood mercury levels were highly elevated. Average total blood mercury concentrations in the GKRO nest were 113, 97, 101, and 205μg/L during years 2006 to 2009, respectively. These values are about 20 times higher than the human health threshold of 5.8μg/L. While mercury concentrations are high, they are among the lowest in the Clark Fork river watershed and are in line with values from much less contaminated tributaries. Interestingly, blood mercury levels in young osprey increase downstream, especially below where the highly mercury-contaminated Flint Creek enters the Clark Fork River near Drummond, where concentrations over 600μg/L have been routinely observed. The source of the mercury is most likely historic precious metals mines that are abundant in the basin. (Langner 2009)

5.0 Direct, Indirect, and Cumulative Effects

Potential impacts to bull trout and designated critical habitat with implementation of the NRM IPMP EA Alternative 2 would occur from accessing treatment areas, manual/mechanical treatments, use of livestock for biological control, use of herbicides, restoration treatments, and from fire.

Removal of plant cover using any technique, but particularly through manual /mechanical means, such as hand-pulling or tilling, would continue to result in negligible to minor or localized moderated adverse effects on water quality from the increased likelihood of eroding loose soil into water runoff during rain or snowmelt causing erosion and sedimentation of nearby surface water (wetlands, streams and rivers). Until vegetation is reestablished, there could be slight spikes in sedimentation, within the natural range of variability, in some surface water resources from the removal of native plant cover.

There are no known direct or indirect impacts from the use of insect biological control agents near surface waters. Impacts of biological treatments on water resources would be negligible. Use of livestock for biological control would continue to have the potential to affect surface water resources from improper handling of excrement, from allowing livestock access to surface water resources, and from heavy runoff through livestock pastures. Effects would range from negligible to moderate. At GRKO, where cows are a part of the cultural landscape, not using cows for invasive nonnative plant treatment would not eliminate them from this cultural landscape. Since 1994, when the entire riparian corridor (122 acres) along the Clark Fork River was fenced at GRKO, livestock grazing (with the exception of small enclosed leafy spurge grazing test plots of <1 acre in 2005 and 2010) in the riparian area has not been allowed. Although exclusion of cows from the riparian zone will be the general rule, limited non-native invasive grazing plots may be implemented in the riparian area with the following mitigation measures:

- Temporary and existing permanent riparian fencing or herding would be used to hold cows in specific plots; and
- Impacts to water quality from cows would be minimized by preventing unlimited access by livestock to open Clark Fork River water.

Because these best management practices (BMPs) would be employed, most effects would be negligible to minor.

Impacts of herbicide treatments on vegetation communities may have a wide range of possible outcomes, including short-term minor to moderate adverse effects; long-term beneficial effects; and long-term minor to moderate adverse effects. Overall, effects are more likely to be minor and short-term when herbicides are spot-sprayed to target specific weeds, compared to broadcast sprayed. Spot spraying minimizes non-target effects, resulting in negligible to moderate short-term adverse effects on native vegetation (depending on the herbicide, and the native plants' proximity to the target weed), ideally followed by long-term beneficial effects on native vegetation as it presumably increases in density and/or vigor following release from competition by the targeted weed.

Use of herbicides within or adjacent to surface waters would continue to be highly controlled, both as to the type of herbicide used and to additional analysis of its potential effects, including alternatives to its use, prior to application. Only herbicides approved for use within or near water would be used in these areas. Requirements or specifications regarding use, including distance from surface water for other herbicides, would also be strictly followed. Additional best management practices such as target, rather than broadcast or aerial spraying in nearby areas would also be used to limit herbicide drift effects over water. Aquatic herbicides designed for use in water do not harm water quality because they break down and come out of solution quickly, and are non-toxic to aquatic wildlife. In addition, because these are generally used in flowing water, their limited effects dissipate quickly. Overall effects would vary from negligible to moderate.

As with most terrestrial wildlife, except insects, it is unlikely that aquatic wildlife would be directly exposed to herbicides during application. Potential effects to aquatic habitat and fisheries could result from toxic concentrations of herbicides reaching and sustaining a 96 hour concentration that can cause fish mortality. Use of herbicides registered for use in or near water (such as water-suitable formulations of glyphosate) would not pose a risk to aquatic communities or other standing water environments and would not be detectable (See NRM IPMP EA Table 37: *Environmental Effects of Current and Proposed Herbicides*). Herbicides used to treat invasive nonnative aquatic species would be those approved for in water application. Impacts resulting from the use of herbicides could have short- and long-term negligible to moderate adverse impacts on native aquatic wildlife species, their habitats, or natural processes sustaining them.

Risks from accidental direct spray or a chemical spill into a water body of a non-aquatic approved herbicide could be moderate and could cause direct mortality of invertebrates or fish, but the probability of either event occurring is low. The following mitigation measures at a minimum will be employed:

- Hazardous spill clean-up materials would be on site during operations;

- Application of herbicides within 50 feet of surface water would be done by hand or with vehicle mounted (hand-gun) ground equipment.
- Application distances near water would adhere to the restrictions printed on the pesticide label;
- No spraying of any herbicide would occur when wind velocity exceeds 10 mph; and
- Application of pesticides during periods of seasonal precipitation or when irrigation is likely to wash residual pesticides into waterways would be limited.

Because procedures that would prevent spills and direct spraying of non-aquatic approved herbicides into fish bearing waters, there would be negligible to minor effects on fish species. If non-target plants that bind sediment, protect banks and shade water were affected by spraying weeds, fish habitat quality could potentially be reduced from a reduction or loss of streamside shading or stabilizing streambank vegetation.

The following tables were adopted from NRM IPMP EA Table 37: *Environmental Effects of Current and Proposed Herbicides*). They describe some of the most commonly used herbicides at GRKO proposed under this alternative and their toxicity to fish, specifically to rainbow trout. The toxicity classification provides a relative ranking of the toxicity of each herbicide to rainbow trout. Of the herbicides used and proposed, picloram and glyphosate (in the Roundup formulation) have the lowest LC50s (which equates to the highest toxicity) for salmonids. Mitigation measures in NRM IPMP EA Appendix K: Impact Avoidance, Minimization, and Mitigation Measures would minimize the potential for adverse effects on aquatic resources.

Table BA-3. Ecotoxicity Categories for Aquatic Organisms.

Toxicity Classification	LC50(mg/L)
Very Highly Toxic	<0.1
Highly Toxic	0.1 – 1
Moderately Toxic	>1 – 10
Slightly Toxic	>10 – 100
Practically Non-toxic	>100

Table BA-4 Characteristics of the Herbicides Commonly Used at Grant-Kohrs Ranch NHS

Active Ingredient	Product Name	Toxicity 96-hour LC50 (mg/L)	Toxicity Classification
2, 4-D Acid	Amine 4	250	Practically Non-toxic
Aminopyralid	Milestone	>100	Practically Non-toxic
Chlorsulfuron	Telar	>122	Practically Non-toxic
Clopyralid	Transline	>100	Practically Non-toxic
Glyphosate	Roundup Pro	86	Slightly Toxic
Imazapic	Plateau	>100	Practically Non-toxic
Metsulfuron-methyl	Escort	>150	Practically Non-toxic
Picloram	Tordon 22K	1-10	Moderately Toxic

In a report prepared for the USDA Forest Service (SERA TR 99-21-15-01e) under section 4.4.1, Risk Characterization, it states "[that] Longer term water concentrations associated with the normal application of picloram at an application rate of 1 lb (a.i.)/acre are likely to be in the range of 0.01 to 0.06 mg/L in areas with substantial rain fall or as the result of applications in which some initial incidental contaminations of water occurs. All of these concentrations are substantially below concentrations that have been shown to impact aquatic plants or animals…Even at the highest estimated concentrations, however, no effects would be anticipated in aquatic animals…" The LC50 values used are for 96-hour exposure periods – this is typically much longer than exposure in a stream environment would be expected, and therefore provides another precautionary buffer in the determination of effects, especially since bull trout are likely migratory through GRKO.

At GRKO from 2007-2009, glyphosate was used to treat an average of 1.5 acres/year and picloram was used to treat an average of 3.76 acres/year. In the future, water suitable formulations of glyphosate will be used to mitigate the risk to aquatic communities. Picloram was not used at GRKO in 2009 and 2010, and will likely be used very little in the future because effective herbicides with less toxicity and fewer environmental effects are available to address spotted knapweed which was the primary target for use of this herbicide.

Direct mortality from fire is unlikely for aquatic organisms. Indirect effects from temporary loss of vegetation, however, could affect aquatic organisms by causing minor increases in erosion and sedimentation or water temperature or other physical and chemical components. Because prescribed fires used to treat infestations of nonnative invasive species would be small, however, extensive impacts would not be expected to occur and although some impacts would be detectable, they would remain generally localized, minor and short-term. Prescriptive fire use for invasive plant management would be used outside of the riparian zone at GRKO.

Restoration would generally have long-term beneficial effects from promoting the reestablishment of native vegetation through seeding or planting, which could help reduce existing erosion and sedimentation of surface waters from increasing plant cover and therefore retention of water for uptake by plants and interruption of soil loss. There would also be a potential that restoration would be unsuccessful, temporarily leaving areas of bare ground. Unless, loss of plant cover occurred over a wide area or for a long period, most changes in water quality would be localized and beneficial (such as reduced sediment transport to surface waters).

Restoration of aquatic habitats by removing nonnative invasive species would have long-term beneficial effects on aquatic wildlife. Removal would increase native habitat components and decrease nonnative habitat components which may not fulfill habitat requirements for food or nesting for native species.

Long-term beneficial effects would likely also occur from the use of a directed decision-making process to identify which species are the highest priorities for treatment and from the use of monitoring to ensure progress is made in treatment. Beneficial effects would also result from selection of the most effective environmentally benign type of treatment and from the ability to use adaptive management to select from newly developed herbicides or treatment methods if these had similar or fewer effects than currently used herbicides or treatments.

Finally, there would be long-term beneficial effects on aquatic habitat from the more effective use of mitigation measures that would help to avoid or minimize impacts of proposed treatments on aquatic species and non-target plants

6.0 Potential Effects to Species Indicators and Habitat Indicators

Species Indicators:

1. Sub-population Size: MAINTAIN. This project would have negligible impacts on sub-population size of bull trout.
2. Growth and Survival: MAINTAIN. Use of herbicides has the potential to affect all life stages of bull trout, but the highest risk is for the egg and fry stage. With mitigation measures being followed and with those life stages not present the risk is considered negligible and discountable.
3. Life History Diversity and Isolation: MAINTAIN. This project would have negligible impacts on life-history diversity and isolation of bull trout.
4. Persistence and Genetic Integrity: MAINTAIN. This project would have negligible impacts on persistence and genetic integrity of bull trout.

Habitat Indicators:

1. Temperature: MAINTAIN. Temperature should not be affected by loss of streamside vegetation associated with herbicide application because streamside shrubs will not be targeted with herbicide application.
2. Sediment: MAINTAIN. There may be slight benefits with reduction in invasive plant abundance and associated decreases in sediment delivery to the river. However, benefits to fisheries will likely be immeasurable in most circumstances.
3. Chemical Contamination/Nutrients: MAINTAIN. There is some risk of herbicide application affecting bull trout in terms of growth and/or survival should significant amounts of certain herbicides reach the river. If mitigation measures and label precautions are adhered to, chances are extremely low that bull trout would be affected. The remote chance of an accidental spill could result in direct effects to populations in the short-term.
4. Physical Barriers: MAINTAIN. No fish passage impairments would result from this project.
5. Substrate Embeddedness: MAINTAIN. Same rationale as sediment
6. Large Woody Debris: MAINTAIN. The project would have no impact on this indicator.
7. Pool Frequency and Quality: MAINTAIN. The project would not change either pool frequency or quality at the reach level.
8. Large Pools: MAINTAIN. The project is not anticipated to change either large pool frequency or quality at the reach level.
9. Off Channel Habitat: MAINTAIN. This project would have no impacts on this indicator.
10. Refugia: MAINTAIN. This project would have no impacts on this indicator.
11. Average Wetted Width/Maximum Depth Ratio: MAINTAIN. This project would have no impacts on this indicator.
12. Streambank Condition: MAINTAIN. The project would not affect streambank condition.
13. Floodplain Connectivity: MAINTAIN. The project would not affect floodplain connectivity.
14. Changes In Peak/Base Flow: MAINTAIN. The project would not affect peak and base flows
15. Increases in Drainage Network: MAINTAIN. The project would not alter the drainage network
16. Road Density and Location: MAINTAIN. This project does not propose to construct or remove road(s).
17. Disturbance History: MAINTAIN. Disturbance history would not be changed by actions proposed for this project.
18. Riparian Conservation Area: Not Applicable
19. Disturbance Regime: MAINTAIN. The project would not alter the existing natural disturbance regime.
20. Integration of Species and Habitat Conditions: MAINTAIN. Project planning and application of the mitigation measures should prevent herbicides from reaching streams. While certain situations could still allow contamination to occur, chemical concentrations and duration of exposure will be significantly below levels shown to cause mortality. The remote chance of an accidental spill could result in direct effects to populations in the short-term. Thus, there is a very small risk of affecting the bull trout in terms of survival. This project will not cause an adverse modification of the proposed critical habitat in the Columbia River Basin

Part 7.0 – Determination – Dichotomous Key for Making ESA Determination of Effect

1. Are there any proposed/listed fish species and/or proposed designated critical habitat in the watershed or downstream from the watershed?

   NO…………………………………..No Effect

   YES…XX………………………………go to question 2

2. Will the proposed actions(s) have any effect whatsoever on the species and/or critical habitat?

   NO…………………………………No Effect

   YES…XX……………………………..(May Affect) go to question 3

3. Does the proposed action(s) have the potential to hinder attainment of relevant "functioning appropriately" indicators>

   NO…XX………………………….....**Not Likely to Adversely Affect**, go to question 4

   YES………………………………..Likely to Adversely Affect

4. Does the proposed action(s) have the potential to result in "take" of any propose/listed species or destruction/adverse modification of proposed/designated critical habitat?

   There is a negligible probability of "take" of the federally listed, threatened bull trout.

The matrix checklist and supporting documentation indicate that the actions proposed for the Northern Rocky Mountains Invasive Plant Management Plan / Environmental Assessment project would be not likely to adversely affect the listed bull trout and its critical habitat.

Part 8.0 – Documentation of Expected Incidental Take

There is no incidental take anticipated from any activity resulted from the actions NPS proposes for this project.

Harm = significant impairment of behavioral patterns such as breeding, feeding, sheltering, and others.

Harass = significant disruption of normal behavior patterns which include, but are not limited to, breeding, feeding, sheltering or others.

Pursue, Hunt, Shoot, Wound, Capture, Trap, Collect

1. What is the approximate duration of the effects of the proposed action(s) resulting in incidental take?

   NONE. This project has negligible probability of "take".

2. Which of the following life stages will be subject to incidental "take"?

   NONE. This project has negligible probability of "take".

3. Which life form and sub-population status are present in the watershed or downstream of the watershed where the activities will take place?

Life Form	Sub-population Status
Resident	x
Adfluvial	
Fluvial	
Anadromous	

4. What is the location of the expected incidental "take" due to the proposed action?

   NONE

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Part 10.0 – Summary and Signature

Project Name: Northern Rocky Mountains Invasive Plant Management Plan / Environmental Assessment, Bull Trout Biological Assessment

Prepared By: Jason Smith

Date Prepared: January 2011

Listed Species	Determination of Effects[1]	Potential for Incidental Take
Bull Trout	NLAA	None

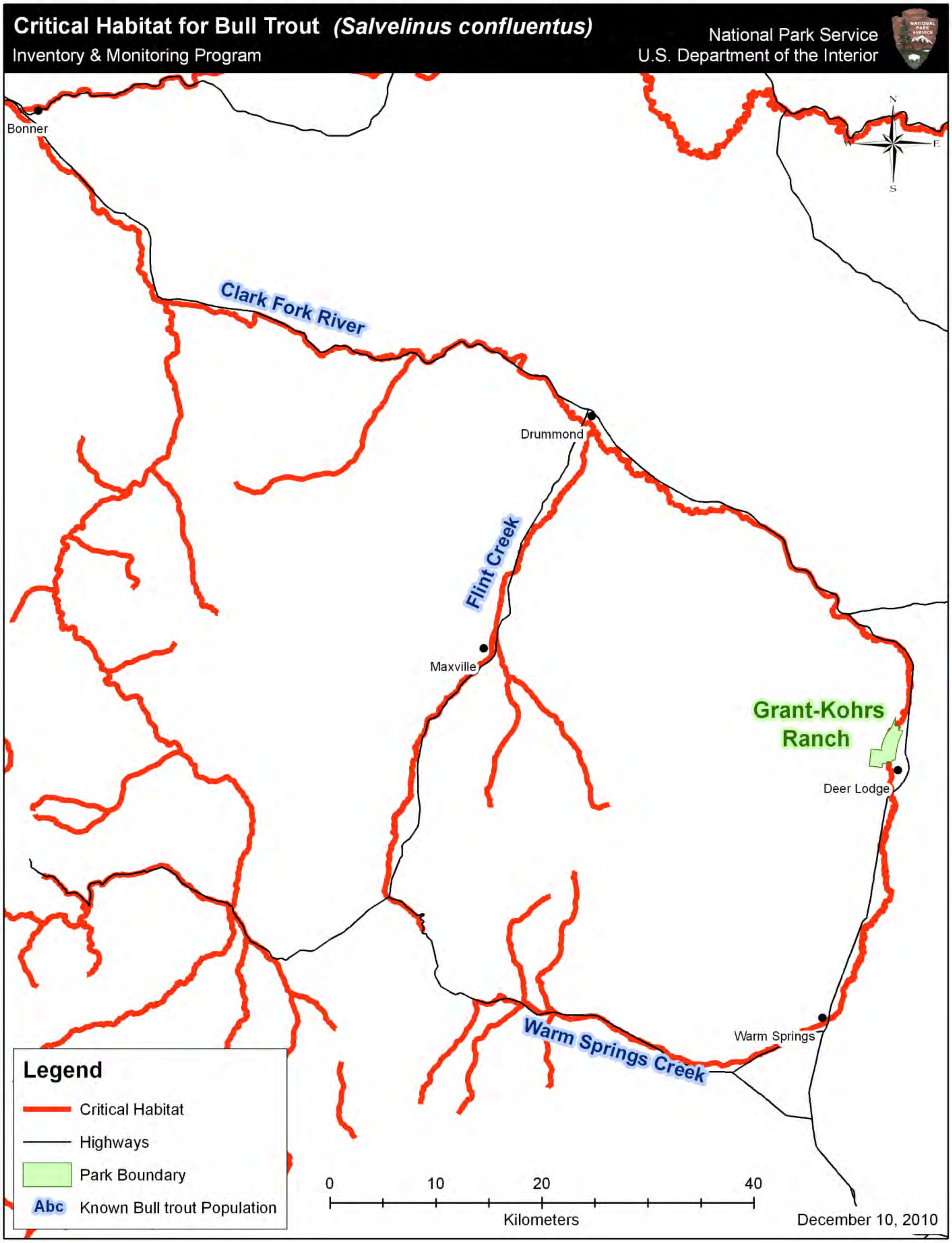
1. **Possible Determinations of Effects:**
   NE = No Effect;

   NLAA = May Affect, Not Likely to Adversely Affect**;**

   LAA = May Affect, Likely to Adversely Affect

Signature: Jason Smith Date: 1/10/2011

Jason Smith
Grant-Kohrs Ranch NHS, Natural Resource Management Specialist


Critical Habitat for Bull Trout (Salvelinus confluentus)
Inventory & Monitoring Program
National Park Service
U.S. Department of the Interior
Bonner
Clark Fork River
Drummond
Flint Creek
Maxville
Grant-Kohrs Ranch
Deer Lodge
Warm Springs
Warm Springs Creek
Legend
Critical Habitat
Highways
Park Boundary
Abc Known Bull trout Population
0 10 20 40
Kilometers
December 10, 2010