

The U.S Bureau of Reclamation (Reclamation) proposes to allow the Northern Colorado Water Conservancy District (District) to apply herbicide to Horsetooth, Soldier Canyon, Dixon Canyon, and Spring Canyon Dams (dams) by aerial spaying for up to five years. The District has submitted a Pesticide Use Proposal (PUP) to Reclamation in order to obtain approval from Reclamation for this proposal. The treatment is intended to prevent invasive and noxious plants from colonizing the aforementioned dams' downstream faces.

I. PURPOSE AND NEED

The purpose of the Aerial Spraying Alternative is to hinder the establishment of invasive and noxious plants, which competitively inhibit the growth of desirable species, while minimizing risks to personal safety. This action is necessary because areas of bare ground, due to recently completed Safety of Dams renovations, are conducive to invasive and noxious plant growth. Leafy spurge (*Euphorbia esula* L.) and other broadleaf weeds pose a threat to the area. The alternative of applying herbicide by walking on the face of the dam, as is necessary for backpack or pump and hose spraying, can pose a personal safety hazard to applicators due to the slope, presence of large rocks, and uneven terrain of the dam faces.

Background

Horsetooth Reservoir (Reservoir) is located west of Fort Collins, CO in a valley between two hogback ridges. The Reservoir, stretching for 6.5 miles and storing up to 151,800 acre-feet of water, supplies project water to the District. The District distributes water from Horsetooth to several municipalities including Fort Collins and rural water districts. Horsetooth Dam encloses the Reservoir at the northern end of the valley while Soldier Canyon, Dixon Canyon, and Spring Canyon secure natural outlets that have eroded in side ridges.

Horsetooth Dam is 4 miles northwest of Fort Collins and is found at T. 7 N., R. 69-70 W., sections 1 and 6. Soldier Canyon Dam is 3.5 miles west of Fort Collins and is located at T.7 N., R. 69 W, Section 7. Dixon Canyon dam is 3 miles southwest of Fort Collins at T.7 N., R. 69 W., Section 20. Spring Canyon Dam is 4.5 miles southwest of Fort Collins at T.7 N. R. 69 W., Section 32 (Figure 1).

Construction during the recent Safety of Dams renovation efforts left the ground on the dams barren and void of vegetation. Until grass or some other type of desirable vegetation is established, the sites are very susceptible to infestation by a broad cross section of weeds, invasive species, and noxious plants. To prevent colonization of undesirable vegetation, Reclamation is proposing to allow the District to apply herbicide by means of a helicopter.

Horsetooth, Soldier Canyon, Dixon Canyon, and Spring Canyon are approximately 3, 7, 8.26, and 6.8 acres, respectively, totaling 25.1 acres. The dams will be sprayed from top to bottom, including the sides or "groins." Areas directly adjacent to the dams that were also disturbed during renovation activities will not be sprayed. These areas are currently being revegetated under a landscape management plan. The maximum area to be sprayed is approximately 25 acres.

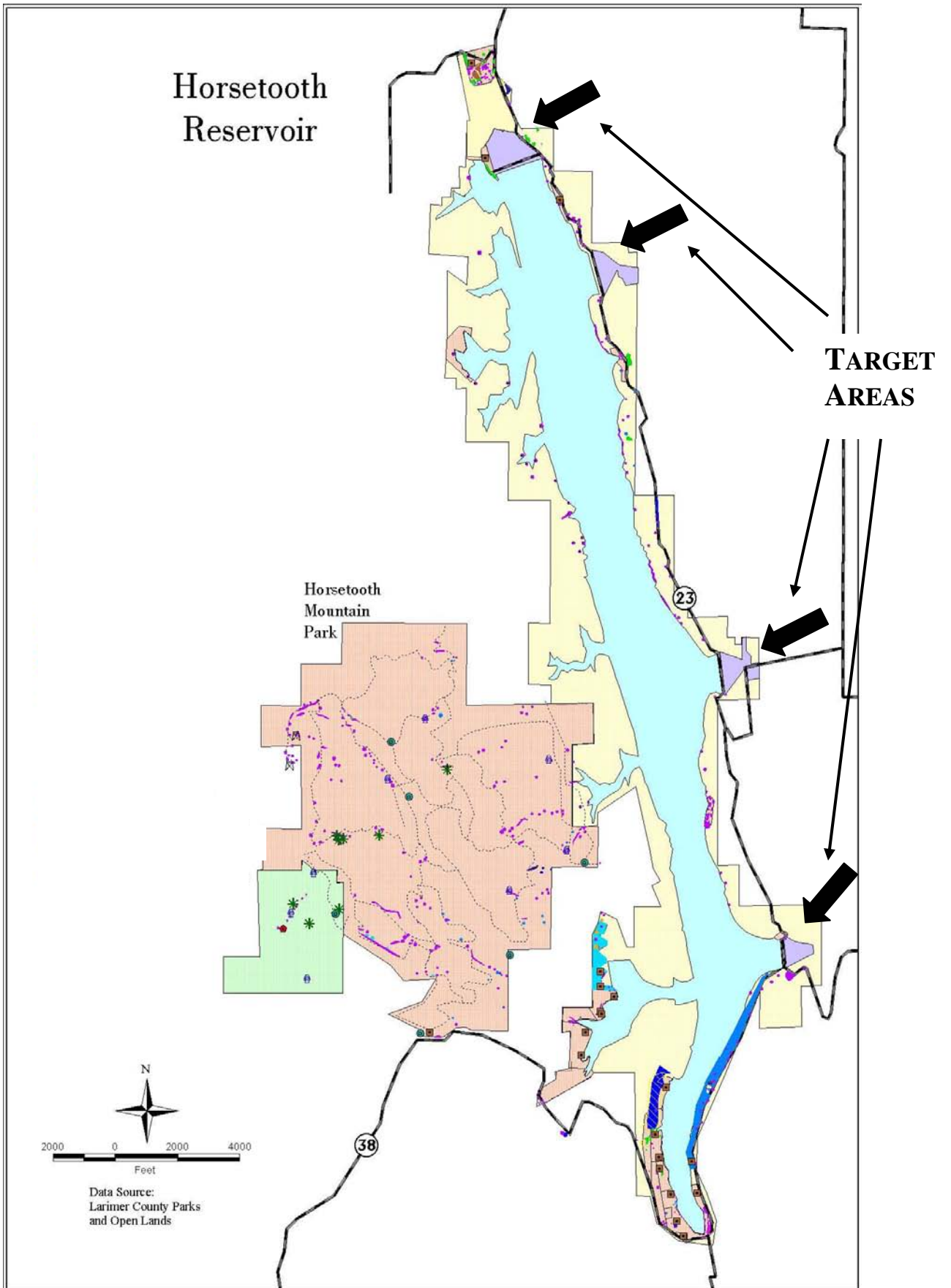


Figure 1. Horsetooth Reservoir and target areas.

If the Proposed Action receives approval, the District would be able to amend their Integrated Pest Management Plan (IPM) to include this type of noxious weed control. The District's current IPM allows for manual spraying of noxious weeds; however, the modernized dam faces, now steep with uneven terrain, represent a personal safety hazard to the pesticide applicators. Additionally, due to the large target area, 25.1 acres, the District has indicated that manual spraying carries approximately the same cost as aerial spraying. Consequently, the District is proposing to aerially spray because it will increase worker safety and is equally cost-effective.

The proposed herbicide is Vanquish (active ingredient: Diglycolamine salt of 3,6-dichloro-0-anisic acid). This selective herbicide, formulated to eradicate broadleaf weeds and brush on non-crop lands, will help to establish desirable plants.

Scoping of Reclamation resource specialists and District personnel indicated the following potentially significant issues involving aerial spraying:

ISSUE	DISPOSITION
<ol style="list-style-type: none"> 1. Spraying recently revegetated and hydro-mulched areas adjacent to the target area. 2. Impacts to recreationists in or near the marked target area. 3. Impacts of helicopter noise and dust on residences in the vicinity of the target area. 	<ol style="list-style-type: none"> 1. Modified the Proposed Action to prevent spraying adjacent areas. 2. Require signing along the parameter advising recreationists to keep out for 24 hours following the spraying. 3. Analyzed in the Affected Environment and Environmental Consequences section.

II. ALTERNATIVES

No Action Alternative

Reclamation would not approve aerial herbicide application to the dams proposed by the District. The District would be expected to employ currently approved methods of weed control. This would include dispensing Vanquish or another broadleaf herbicide by means of a pump truck with several individuals physically walking across and spraying the dam faces.

Aerial Spraying Alternative

Reclamation would approve the proposal by the District to apply herbicide to the dams by aerial spraying using a helicopter. This alternative requires that herbicide application be carried out by a licensed pesticide applicator according to Vanquish's Directions of Use. Prior to spraying, the target area will be clearly delineated so the application will not harm the landscaping work that has occurred adjacent to the dam faces. Further, signs will be posted around the target area instructing recreationists not to enter until 24 hours after the spraying. Lastly, the spraying will occur Monday-Thursday during summer and/or early fall months.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENSES

Scoping determined that the Proposed Action would have no impacts on environmental justice, (adverse effects to a particular social-economic group, including low-income or minority

populations), Indian trust assets (legal interests in property and rights held in trust by the U.S. for Indian tribes or individuals), recreation, water quality, wetlands, and wildlife. The following discussion of specific resources discloses the possible effects to resources that may be impacted by the Proposed Action.

Vegetation

The recently completed modernization of the Horsetooth Dams left the dams' surfaces and the surrounding area void of vegetation. Areas of disturbance, such as this, are very conducive to colonization by noxious and invasive plants. These invaders are very pugnacious and, by out-competing native grasses, alter the ecosystem. Reclamation is currently employing a Landscape Management Plan, which includes hydro-mulching and planting desirable vegetation in the recently disturbed areas immediately surrounding the dam faces. This effort should increase biodiversity in the area and enhance community resistance to invasive plant species (Levine 2000).

The dams' faces were not hydro-mulched, revegetated, or included in the Landscape Management Plan because they are primarily composed of rock and lack good soil. Additionally, the faces are intended to be largely void of vegetation. The District anticipates a wide cross-section of broadleaf weed invaders, despite these unfavorable conditions. Patches of Leafy spurge (*Euphorbia esula* L.), a perennial invader, have already been identified on the dams' surfaces. This plant, inadvertently introduced in 1927, is an aggressive and efficient colonizer that has already infested over 2.5 million acres in northcentral North America (Whitson, Burrill, Dewey, Cudney, Nelson, Lee, and Parker 1992).

“The introduction of harmful, non-native, invasive species – terrestrial and aquatic – has received heightened recognition because of the threats of this form of ‘biological pollution’ poses to ecosystem health, endangered species, and even public health” (Jenkins 2002). The Federal Government and the state of Colorado have recognized the threat that invasives pose and each have regulations and laws regarding their control and eradication (Executive Order 13112, Colorado Noxious Weed Act).

No Action Alternative. Under this alternative, undesirable plants would be eradicated through manual spraying, which is already approved by the District's IPM. Choosing this alternative would result in:

- The use of Vanquish or a similar broadleaf herbicide;
- Annual herbicide treatments for approximately 5 years or until the invasive species threat is controlled;
- Application of herbicide only to the downstream faces of the dams – no impact would be noticed on adjacent parcels of land and areas undergoing revegetation;
- Prevention of establishment of noxious weeds, allowing colonization of desirable plants on the dam faces.

Aerial Spraying Alternative. Under this alternative, noxious and invasive botanical invaders would be eradicated through aerial application of herbicide by means of helicopter. This would entail:

- The use of Vanquish broadleaf herbicide;

- Annual herbicide treatments for approximately 5 years or until the invasive species threat is controlled;
- Application of herbicide only to the downstream faces of the dams – no impact would be noticed on adjacent parcels of land and areas undergoing revegetation;
- Prevention of establishment of noxious weeds, allowing colonization of desirable plants on the dam faces.

Air/Noise Quality

The primary contributor to air and noise impacts within the vicinity of the dam faces is traffic along the roadway over each of the dams. The roadway provides local and regional access for commuters, recreationists, and travelers, as well as providing scenic driving opportunities along Horsetooth Reservoir.

No Action Alternative. Under this alternative, the impacts to air quality by the truck and pump used to apply herbicide would be similar in nature to existing traffic flow in the area. Impacts would be short term, not lasting more than a few hours at each site. Herbicide impacts to air quality would be localized and only occur during spraying. Vanquish's Directions of Use prescribe specific weather conditions that must be followed to avoid spray drift and maintain suitable air quality beyond the target area (dam face). These directions will be followed and, therefore, air quality is not expected to be impacted; see *Appendix A* for product label and directions.

Impacts to noise quality by the truck and pump would be similar to existing noise impacts from regular traffic flow across the dam, but would be stationary rather than transient. Impacts would be short term, not lasting more than a few hours at each site, and not audible between sites.

Aerial Spraying Alternative. Under this alternative, the helicopter is expected to generate dust during landing and takeoff if done in a field rather than at a heliport. Based on the total acres to be sprayed and the need to refill herbicide, no more than 2 landings and takeoffs are expected. Dust is not typically generated from rotor downwash during spraying (Ron Osborne, personal communication, July, 9 2004). Herbicide impacts to air quality would be localized and only occur during spraying; no impacts are expected once the herbicide has landed on plant and ground surfaces. As herbicide will be applied by a licensed handler and in accordance with labeling/directions, spray drift is expected to be minimal and contained within the target area. No air quality impacts are expected outside of the target area as the area will be marked and an on-the-ground individual to monitor for appropriate weather conditions will be used. Again, see *Appendix A* for product label and directions.

Using a helicopter to apply herbicide would generate noise similar to other rotary aircraft noise such as news, public safety, or agricultural aircraft that may occur in the vicinity of the dams. In the immediate area there would be an increase in noise levels from the helicopter, but impacts would be short term (approximately 10 minutes per site). In addition, herbicide applications would occur Monday-Thursday to minimize potential disturbance to local residences and recreationists.

Cultural Resources

Herbicide application, either by means of a helicopter or by manual spraying, is the type of undertaking that has no potential to have effects on cultural resources. Therefore, this is a type of undertaking that would not require consultation.

Threatened and Endangered Species

Reclamation sent a memorandum to the Fish and Wildlife Service on 25 June 2004 requesting concurrence on a list of threatened and endangered species that may be affected by the Proposed Action. On 8 July 2004, Reclamation received a memorandum from the Fish and Wildlife Service identifying two additional species, in addition to the three already identified by Reclamation, that have potential to be in the vicinity of the project.

Preble's Meadow Jumping Mouse

Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) is listed as threatened under the Endangered Species Act. Along Colorado's Front Range, the mouse is found below 7,600 feet in elevation, in areas near streams with medium to high levels of moisture, and in environments consisting of grasses and forbs where high shrubs or low trees provide adequate cover. Arthur's Rock Gulch, on the west side of Horsetooth Reservoir is the only known location of Preble's Meadow Jumping Mouse in the reservoir area. The Fish and Wildlife Service has proposed that Arthur's Rock Gulch be declared a mouse protection site.

Ute Ladies'-Tresses Orchid

Ute Ladies'-Tresses Orchid (*Spiranthes diluvialis*) is a federally threatened species found in sixteen populations along Colorado's Front Range. The plant occurs below 6,500 feet in elevation in moist to wet alluvial meadows, floodplains or perennial streams, and near springs and lakes. One population of Ute Ladies'-Tresses Orchid is found in Larimer County. This population is located in a wetland area associated with a seep below the Pleasant Valley and Lake Canal northeast of Horsetooth Reservoir.

Black Tailed Prairie Dog

The Black Tailed Prairie Dog (*Cynomys ludovicianus*) is candidate for listing as a threatened or endangered species. This heavy-bodied rodent with a black-tipped tail is native to the short-grass prairies of western North America. Allegedly, the Black Tailed Prairie Dog once inhabited seven million acres in Colorado. Typically, residing in south-central/southeastern Colorado and along Colorado's Front Range, below 6,000 feet in elevation, Black Tailed Prairie Dogs are a dynamic component of an ecosystem, serving as food for many predators and whose empty burrows serve as homes for burrowing owls, black-footed ferrets, rabbits, and rattlesnakes (Black Tailed Prairie Dog, 2004).

Bald Eagle

The Bald Eagle (*Haliaeetus leucocephalus*) is a federally threatened species. Bald eagles occupy nest sites during the summer season and roost sites during the winter. Both nesting and roosting sites are typically near bodies of water that are abundant in prey. There are no known nesting sites in the vicinity of Horsetooth Reservoir.

Colorado Butterfly Plant

The Colorado Butterfly Plant (*Gaura neomexicana* spp. *coloradoensis*), a short-lived, perennial herb, was listed as a federally endangered species in 2000. This plant is endemic to Southeast Wyoming, Western Nebraska, and Northeastern Colorado. The butterfly plant is found in habitats characterized by sub-irrigated, alluvial soils of drainage bottoms surrounded by mixed grass prairie in elevations 5800 and 6400 feet. Field studies suggest that the plant has been extirpated from its historical range in Larimer and the surrounding Counties (Fertig 2000).

No Action and Aerial Spraying Alternatives.

Preble's Meadow Jumping Mouse

The dam faces consist of heavily disturbed and imported soil and rock, which currently contains little vegetation and does not contain constituent habitat for Preble's meadow jumping mouse. Therefore, Reclamation has determined that the No Action and Aerial Spraying Alternatives would have no effect on Preble's meadow jumping mouse or its critical habitat.

Ute Ladies'-Tresses Orchid

The dam faces consist of heavily disturbed and imported soil and rock, which currently contains little vegetation and does not contain constituent habitat for Ute ladies'-tresses orchid. Therefore, Reclamation has determined that the No Action and Aerial Spraying Alternatives would have no effect on Ute ladies'-tresses orchid or its critical habitat.

Black Tailed Prairie Dog

The dam faces consist of heavily disturbed, imported soil and rock, which currently contains little vegetation and does not contain constituent habitat for the black tailed prairie dog. Therefore, Reclamation has determined that the No Action and Aerial Spraying Alternatives would have no effect on the black tailed prairie dog or its critical habitat.

Colorado Butterfly Plant

The dam faces consist of heavily disturbed, imported soil and rock, which currently contains little vegetation and does not contain constituent habitat for the Colorado butterfly plant. Therefore, Reclamation has determined that the No Action and Aerial Spraying Alternatives would have no effect on the Colorado butterfly plant or its critical habitat.

Bald Eagle

Bald eagles are active near nesting sites during the summer. The area around Horsetooth Reservoir, while providing roost sites for the birds in the winter, does not contain any known nesting sites for bald eagles. Because the spraying would occur during summer months or early fall when bald eagles are not present in the area, Reclamation has determined that the No Action and Aerial Spraying Alternatives would have no effect on the bald eagle or its critical habitat.

IV. CONSULTATION AND COORDINATION

Reclamation consulted with specialists within the agency on the alternatives considered in this environmental assessment, including environmental, pesticide, and lands specialists and a

landscape architect. In addition, four other entities were consulted about providing information for the EA:

Kevin Waller, Northern Colorado Water Conservancy District, who provided background information on the District's noxious weed treatment.

Maxine Guill, Larimer County Parks and Open Lands, who provided information regarding noxious and invasive weeds near Horsetooth Reservoir.

Ron Osbourne, Frontier Helicopters, who provided information on the amount of rotor downwash that is caused by the helicopter during the application of herbicide.

Brent Bibbes, Colorado Division of Wildlife, who provided information regarding Bald Eagle nesting sites at Horsetooth Reservoir.

Works Cited

Black Tailed Prairie Dog. *Species Conservation*. 25 February 2004. Colorado Department of Wildlife. Accessed : 6 June 2004. <http://wildlife.state.co.us/species_cons/PrairieDog/>.

Fertig, Walter. 2000. Status Review of the Colorado Butterfly Plant. University of Wyoming Diversity Database. Accessed 15 June 2004. <http://uwadmnweb.uwyo.edu/wyndd/Reports/pdf_fertig/Fertig2000_Gaura_neomexicana.pdf>.

Jenkins, P.J. 2002. Paying for Protection from Invasive Species. *Issues in Science and Technology*. **19**: 67-73.

Levine, J.M. 2000. Species Diversity and Biological Invasions: Relating Local Process to Community Pattern. *Science* **288**: 852-855.

Whitson, T., L Burrill, S. Dewey, D. Cudney., B. Nelson, R. Lee, R. Parker. *Weeds of the West: The Western Society of Weed Science*. Pp. 316, 317.

Appendix A.

Vanquish's Directions of Use.