ENVIRONMENTALLY SENSITIVE AREAS AND WETLAND REPORT FOR THE ROCKY MOUNTAIN VILLAGES III PROPERTIES

Prepared
by
Cedar Creek Associates, Inc.
Fort Collins, Colorado

Prepared
for
McWhinney Enterprises
Loveland, Colorado

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INTRODUCTION AND LOCATION

This report documents the evaluation of environmental conditions at the Rocky Mountain Villages III properties in Loveland in accordance with City of Loveland Planning Department guidelines for preparation of an Environmentally Sensitive Areas Report (Attachment D - 9/23/98). This report includes an evaluation of three separate parcels proposed for development. The properties are all located in Township 5 North, Range 68 West. The western-most parcel consists of approximately 480 acres in Section 17 (W 1/2 & NW 1/4 of SE 1/4). The central parcel is comprised of approximately 665 acres and occupies portions of Section 9 (N 1/2), Section 4 (S 1/2), and Section 10 (NW 1/4). The eastern-most and largest parcel consists of approximately 960 acres and occupies portions of Section 10 (E 1/2), Section 11 (W 1/2), Section 2 (SW 1/4), and Section 3 (SE 1/4). The locations of each parcel are shown on Figure 1. The proposed development parcels consist primarily of cultivated land except for drainages, irrigation ditches, reservoirs, reservoir margins.

Wetland surveys and field evaluations of habitats were completed by Cedar Creek personnel on November 5, 6, 10, and 11, 1998. Observations recorded included: major vegetation communities / wildlife habitats present within the property; dominant flora associated with each community / habitat; unique habitat features; and observations of wildlife species and/or definitive sign. Wildlife presence and habitat use was based on on-site observations and habitat presence in conjunction with the known habitat requirements of potential wildlife species. Once the field reconnaissance was completed, environmentally sensitive areas and other habitats were delineated from color aerial photographs of the properties. Wetland surveys were completed to satisfy Corps of Engineers guidelines (Environmental Laboratory, Department of the Army 1987) for determination of "jurisdictional" wetlands. The results of these survey are also summarized in this report. Detailed mapping of jurisdictional wetlands is provided on the General Development Plan maps for Parcels A, B, C, and D.
This report summarizes the findings of the field surveys, identifies environmentally sensitive areas on the properties, discusses potential impacts associated with the proposed development, and provides recommendations for mitigation.

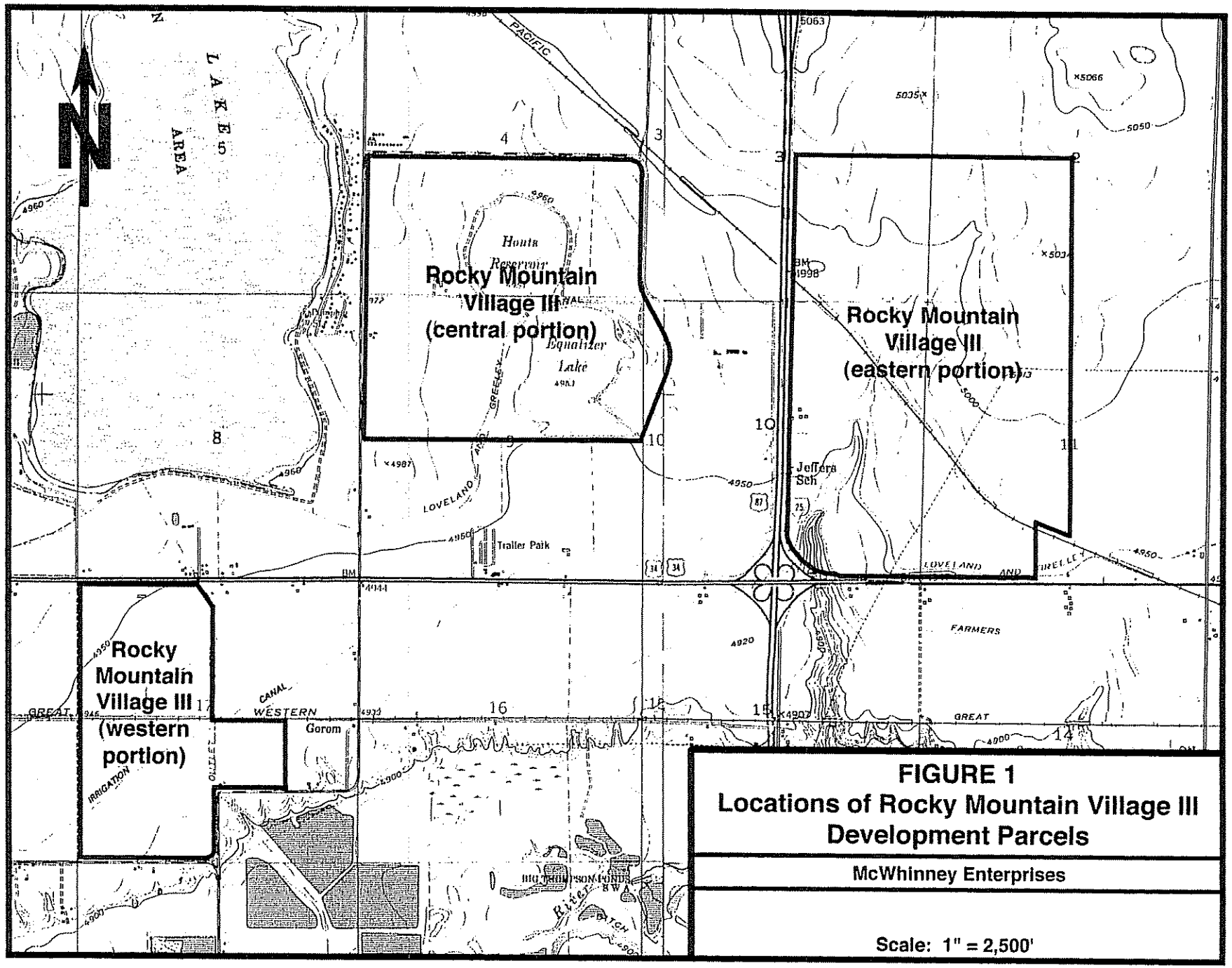

FIGURE 1
Locations of Rocky Mountain Village III Development Parcels

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Scale: 1" = 2,500'

HABITAT CONDITIONS AND ENVIRONMENTALLY SENSITIVE AREAS

Western Portion

This development parcel is nearly level and is comprised almost entirely of actively cultivated cropland (see Figure 2). Areas defined as environmentally sensitive by City of Loveland guidelines are limited to an irrigation ditch (Farmers Ditch) and the Outlet Ditch that carries overflow water from Boyd Lake to the Big Thompson River. There are no other drainages, areas of wildlife habitat, or other Natural Areas (*In the Nature of Things, Loveland's Natural Areas* - October 1996) in this parcel that would qualify as environmentally sensitive areas (see Figure 3).

According to the *Soil Survey of Larimer County Area, Colorado* (SCS 1980), predominant soils in the area include Aquepts, Nunn clay loam, and Stoneham loam. These are not highly erosive soils; runoff is slow to medium and the hazard of wind or water erosion is slight to moderate. No slopes over 20 percent, land formerly used for landfill operations or hazardous industrial use, or fault areas were identified on the property.

Wetlands associated with the Farmers Ditch were not delineated because wetlands supported in active irrigation ditches are not classified as jurisdictional by the Corps of Engineers. In addition, since active cultivation approaches to the edge of this narrow ditch and there is minimal vegetation cover, this ditch has little value as wildlife habitat or as a movement corridor.

The only jurisdictional wetlands on the property were located within the Outlet Ditch. At the time of the survey, there was flowing water (6 to 10 inches deep) in the bottom of ditch and wetlands were restricted to the edges of the flowing channel and the side-slopes of the ditch (see Figure 2). There were also some minor inclusions of uplands on the ditch banks. Wetland herbaceous vegetation within the ditch was characterized by reed canarygrass (*Phalaris arundinacea*), common cattail (*Typha latifolia*), hemp dogbane (*Apocynum cannabinum*), showy milkweed (*Asclepias speciosa*), field horsetail (*Equisetum arvense*), and Emory sedge (*Carex emoryi*). Several large, mature plains cottonwoods (*Populus sargentii*) also grow within the ditch (see Figure 2). There were individual box elder trees (*Acer negundo*) and scattered pockets of coyote willow (*Salix exigua*), red hawthorn (*Crataegus erthyropoda*), and wild plum (*Prunus americana*) along the ditch, as well.

The Outlet Ditch was classified as an environmentally sensitive area because it supports wetlands and mature cottonwood trees. Based on the rating system used in *In the Nature of Things, Loveland's Natural Areas* (ratings of 1 to 10 with 10 indicating highest value and 1 indicating lowest habitat value), the outlet ditch was given a rating of "3." Although the ditch contains wetlands and several large trees, its overall

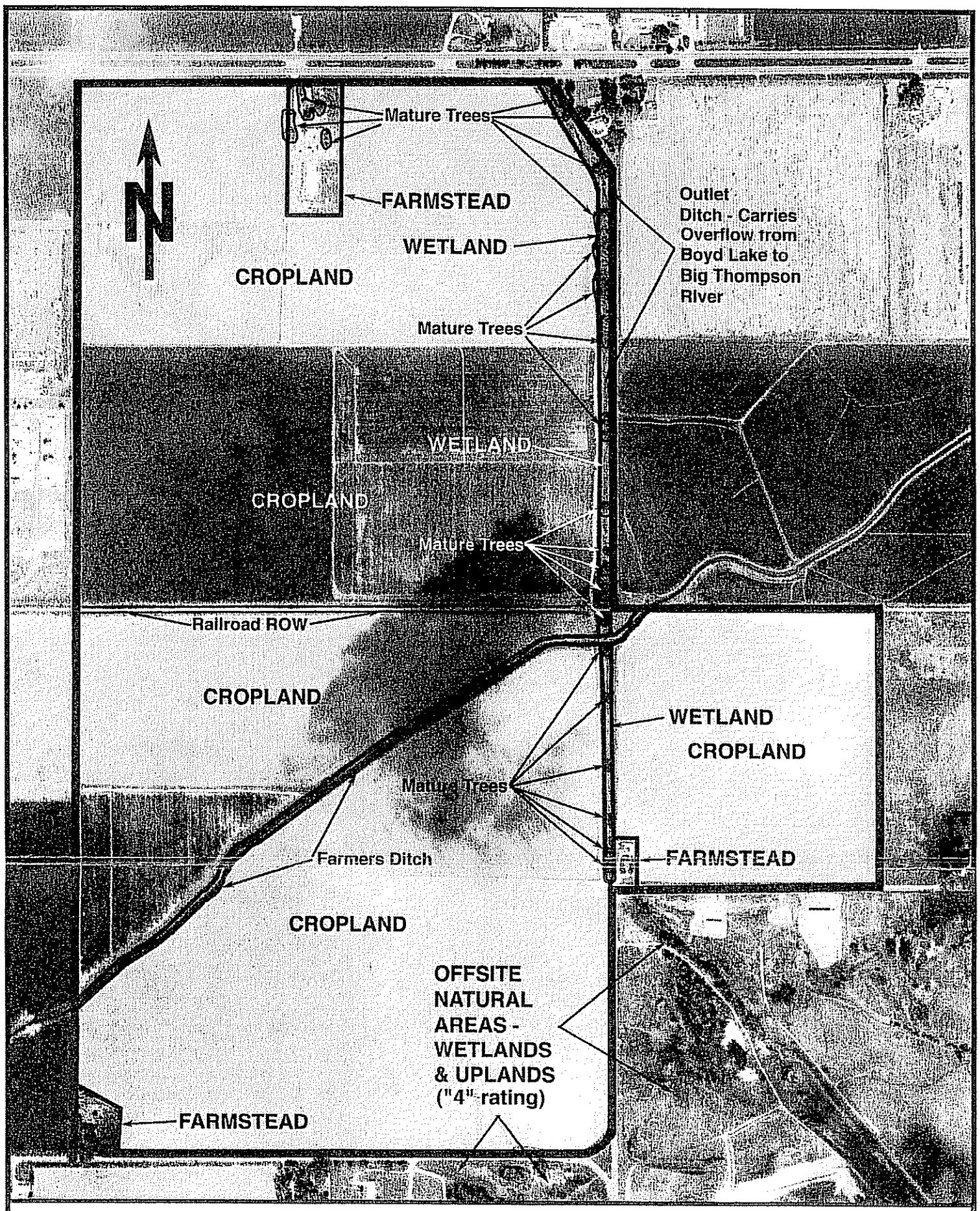

FIGURE 2
Habitat Mapping

Rocky Mountain Village III - Western Portion

McWhinney Enterprises

Scale: 1" = 600'

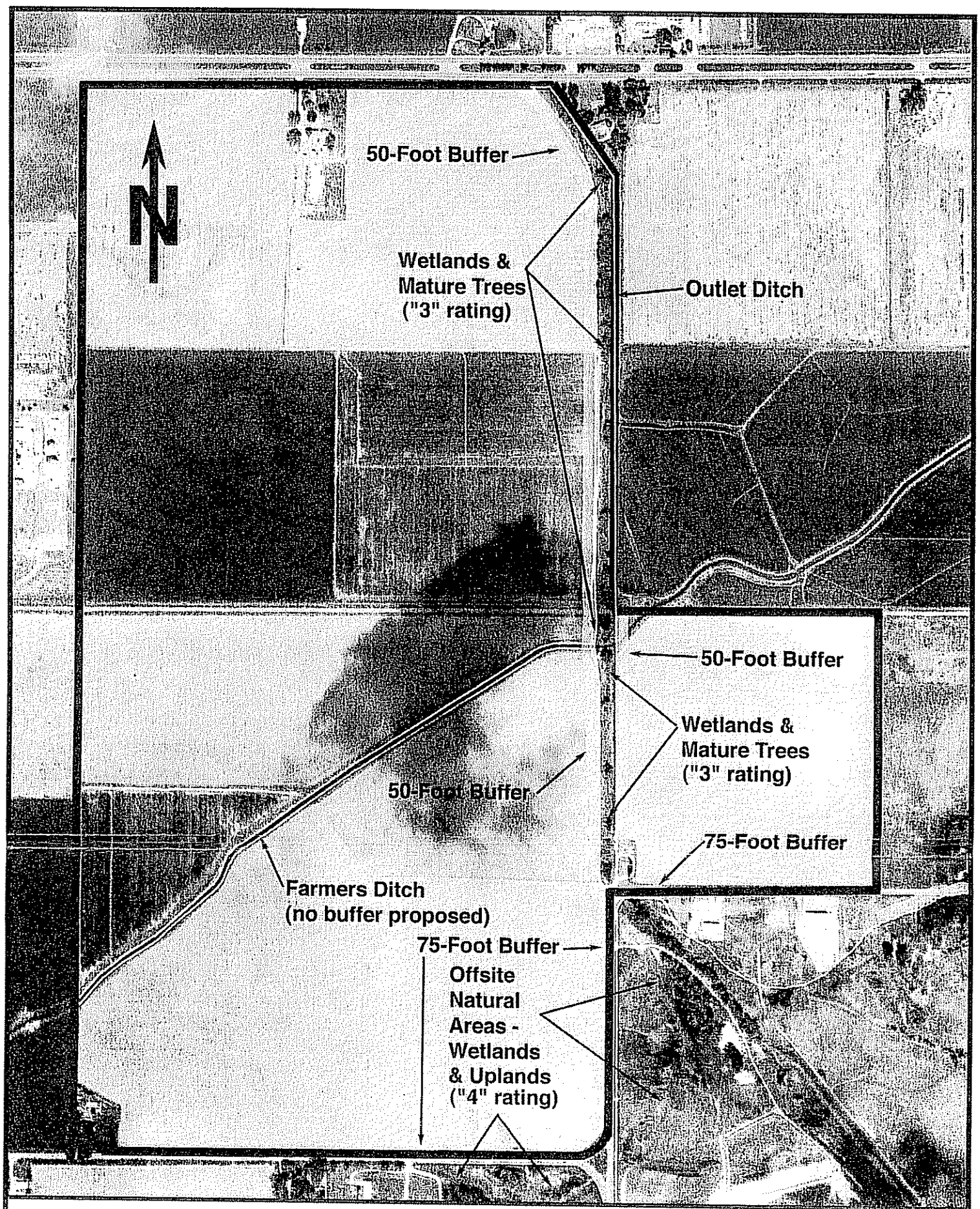

FIGURE 3
Environmentally Sensitive Areas

Rocky Mountain Village III - Western Portion

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Environmentally Sensitive Areas Rated 5 or Below (Recommend 50 to 75-foot buffer to protect natural resources)

Scale: 1" = 600'

habitat value is limited by its narrow configuration, lack of adjacent natural habitats, its close proximity to croplands, and its lack of continuity with other natural areas.

Habitat between the outlet ditch edge and cropland is restricted to a narrow strip of ground supporting primarily non-native and annual weedy species such as smooth brome (*Bromus inermis*), cheatgrass (*Bromus tectorum*), prostrate knotweed (*Polygonum aviculare*), common mullein (*Verbascum thapsus*), yellow foxtail (*Setaria glauca*), field bindweed (*Convolvulus arvensis*), prickly lettuce, (*Lactuca serriola*), common dandelion (*Taraxacum officinale*), Canada thistle (*Cirsium arvense*), and musk thistle (*Carduus nutans*). These areas and adjacent croplands have limited wildlife habitat value and would not be classified as environmentally sensitive areas.

It should be noted that two areas classified as Natural Areas (Sites #14 and #15 with a "4" rating) in *In the Nature of Things, Loveland's Natural Areas* exist adjacent to the southeast corner of the property (see Figures 2 and 3). These areas contain a mixture of wetlands and uplands, and the area east and south of County Road 9E has undeveloped land continuity with the Big Thompson River corridor to the south. These areas lack continuity with the Rocky Mountain Village III Western Portion, however, because of the presence of County Road 9E.

Wildlife Use and Corridors

The only potential wildlife movement corridor on the property is the Outlet Ditch. This ditch is hydrologically linked to Boyd Lake and the Big Thompson River, but it does not provide a continuous wildlife movement corridor between these two areas due to disruption by Highway 34 at the north edge of the property and by County Road 9E at the south edge of the property. The greatest potential for wildlife movement to and from the property is most likely to occur across County Road 9E from the Big Thompson River corridor. County Road 9E is a two-lane road with relatively low traffic volume. Wildlife movement between the property and the Boyd Lake area to the north is unlikely since wildlife would have to cross a four-lane, high-speed highway (Highway 34) with high traffic volumes. In addition, the size of the Outlet Ditch culvert under Highway 34 is insufficient in size to permit passage by most wildlife species.

Wildlife use of the property is limited primarily to urban-adapted songbirds, small and medium-sized mammals (rodents, red fox, raccoon, striped skunk), and reptiles and amphibians. Open-country raptor species such as great-horned owl and red-tailed hawk may use the large trees in the Outlet Ditch as perch sites, although suitable hunting habitat is limited by adjacent croplands. No evidence of past raptor nesting activity (stick nests, nest cavities, or whitewash) was noted during the field survey. Wildlife species noted during the field survey included common snipe, great-horned owl, American robin, and American kestrel along the Outlet Ditch. A dead red fox was also found along the edge of the Outlet

Ditch. Canada goose droppings between a harvested cornfield and the Outlet Ditch indicated considerable use of the area by Canada geese.

Croplands have little value for wildlife because of seasonal cultivation or mowing and the lack of forage and cover. As a wheat or corn crop matures, croplands may receive limited use by species such as white-tailed deer, raccoon, striped skunk, ring-necked pheasant, common grackle, red-winged blackbird, and western meadowlark. Once the crop is harvested and cover is removed, wildlife use of this habitat is limited to occasional use by rodents, songbirds, and waterfowl such as Canada goose that forage for remnant wheat or corn kernels left by harvest operations.

No habitat for any state or federally listed threatened or endangered species exists within or near the Western Portion property. Suitable habitat for Ute ladies-tresses' orchid (*Spiranthes diluvialis*) and Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is not present along the wetlands within the Outlet Ditch due to the steep side-slopes. Wintering bald eagles in the region may occasionally perch in large cottonwoods along the ditch, but surrounding croplands do not provide suitable winter foraging habitat.

Central Portion

This nearly level development parcel is composed of actively cultivated cropland and two irrigation reservoirs (Houts Reservoir and Equalizer Lake), as well as wetland, disturbed/weedy, grassland, and rabbitbrush/grassland habitats (see Figure 4). Cropland, disturbed weedy areas, and rabbitbrush/grassland do not meet any criteria for classification of environmentally sensitive areas. Cropland is seasonally disturbed and lacking vegetation cover between late fall and spring. It provides minimal wildlife habitat except for occasional foraging by Canada geese after harvest.

Disturbed/weedy areas have been cleared of native vegetation and revegetated by primarily weedy and non-native grasses and forbs. Dominant vegetation in these areas included kochia (*Kochia scoparia*), prickly lettuce (*Lactuca serriola*), flixweed (*Descurainia sophia*), Canada thistle (*Cirsium arvense*), intermediate wheatgrass (*Agropyron intermedium*), western wheatgrass (*Agropyron smithii*), and cheatgrass (*Bromus tectorum*). The disturbed weedy area on the west side of Houts Reservoir (see Figure 4) also contained scattered trash piles, old car bodies, and abandoned farm implements, particularly at the south end.

The two rabbitbrush/grassland habitat parcels on the west side of Equalizer Lake appeared to have had some surface disturbance in the past and currently support a mixture of native shrubs and non-native weedy species. Dominant vegetation in this habitat was rubber rabbitbrush (*Chrysothamnus nauseosus*), fringed sagebrush (*Artemisia frigida*), broom snakeweed (*Gutierrezia sarothrae*), winterfat (*Eurotia lanata*),

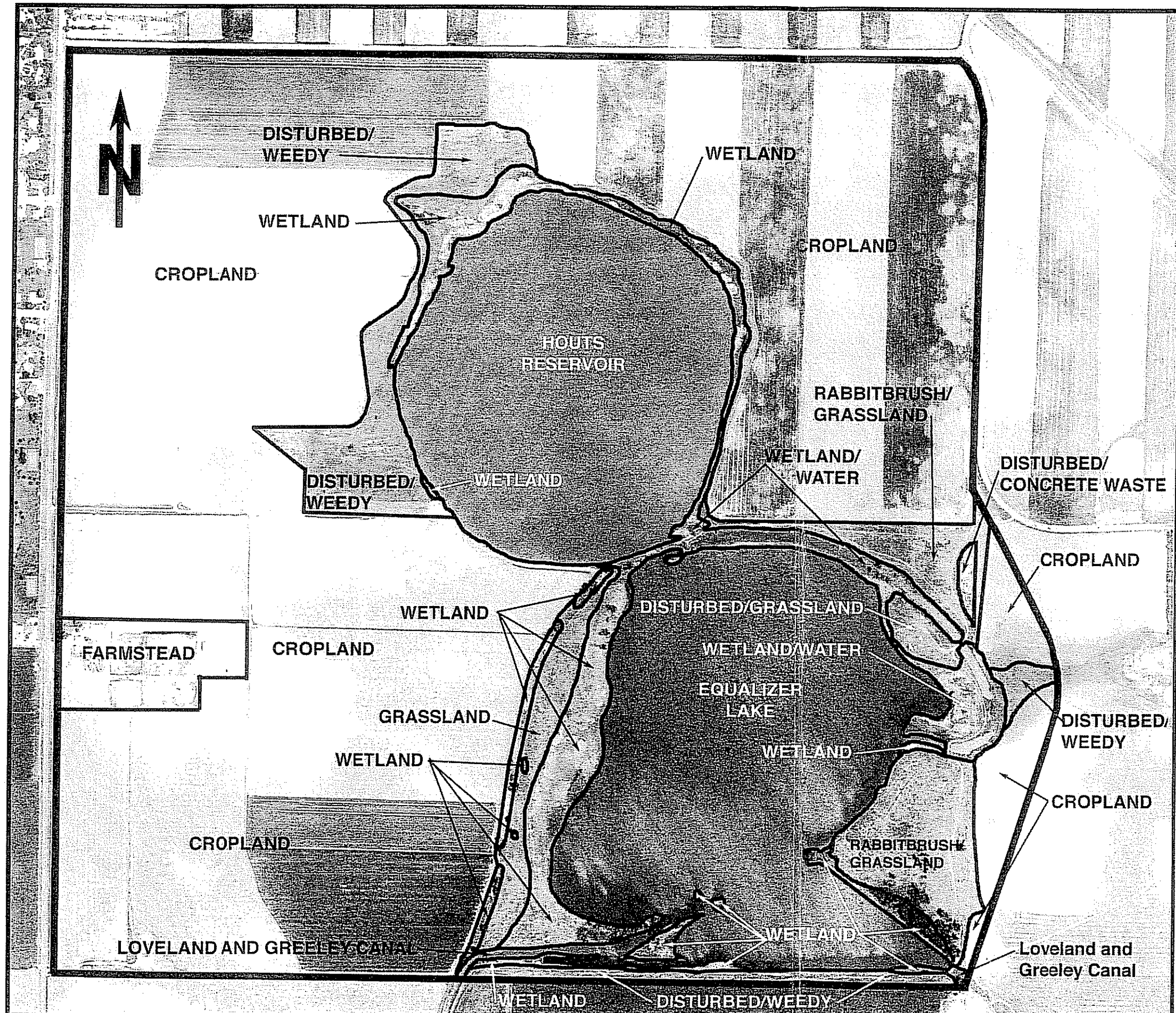

FIGURE 4
Habitat Mapping

Rocky Mountain Village III - Central Portion

McWhinney Enterprises

Scale: 1" = 600'

crested wheatgrass (*Agropyron cristatum*), cheatgrass, kochia, and Russian thistle (*Salsola kali*). These two habitat areas also contain prairie dog burrows, but observed burrow openings were in disrepair, and there was no evidence of recent occupation by prairie dogs. It is unknown if the prairie dog town had been poisoned or if plague or some other disease had caused the loss of prairie dogs in this area. This habitat is not unique in the region, and with the lack of a prairie dog population its value as hunting habitat for open-country raptors or mammalian predators is limited.

Houts Reservoir and Equalizer Lake are both classified as Natural Areas and were given overall ratings of "5" and "6," respectively in *In the Nature of Things, Loveland's Natural Areas* . Other areas on the property that were determined to qualify as environmentally sensitive areas based on field surveys and City of Loveland guidelines were lake shoreline areas that support wetlands and mature trees. There are no other drainages, areas of important wildlife habitat, or other natural areas (*In the Nature of Things, Loveland's Natural Areas*) in, or adjacent to, this parcel that would qualify as environmentally sensitive areas (see Figures 4 and 5).

According to the *Soil Survey of Larimer County Area, Colorado* (SCS 1980), predominant soils in the area include Aquepts, Heldt clay loams, Kim loam, Nunn clay loams, and Ulm clay loam. Most of these soil units are not highly erosive soils; runoff is slow to medium and the hazard of wind and water erosion is slight to moderate. However, most of the east side of Houts Reservoir is classified as Heldt clay loam, 3 to 6 percent slopes. Runoff is rated as rapid by the SCS for this unit, with the hazard of wind erosion moderate and the hazard of water erosion severe. The field survey indicated proper surface management of this cropland area, and no problem erosion areas were observed. No slopes over 20 percent, land formerly used for landfill operations or hazardous industrial use, or fault areas were identified on the property.

Seasonal drawdowns in both lakes subject the shoreline areas to large fluctuations in water levels. As with many of the irrigation reservoirs in the region, these conditions and other management practices (e.g., rip-rapped shorelines) have limited the establishment of wetland habitats along some portions of the shoreline, especially at Houts Reservoir. The overall ratings of "5" and "6" for Houts Reservoir and Equalizer Lake, respectively, do not provide an accurate assessment of the wetlands and other natural habitats adjacent to the lakes since the ratings take into account wetlands that are marginal or non-existent along portions of the shoreline areas. In order to provide a more accurate, site-specific assessment of the overall habitat quality of shoreline wetland habitats and environmentally sensitive areas adjacent to the lakes, a ranking scheme, similar to that used in *In the Nature of Things Loveland's Natural Areas*, was developed to classify distinct shoreline segments. These rankings were then evaluated to determine appropriate recommendations for buffer zones, land use management, and adjacent development. Wetland shoreline habitat and associated upland natural areas were rated as Highest ("6" to "8" ratings),

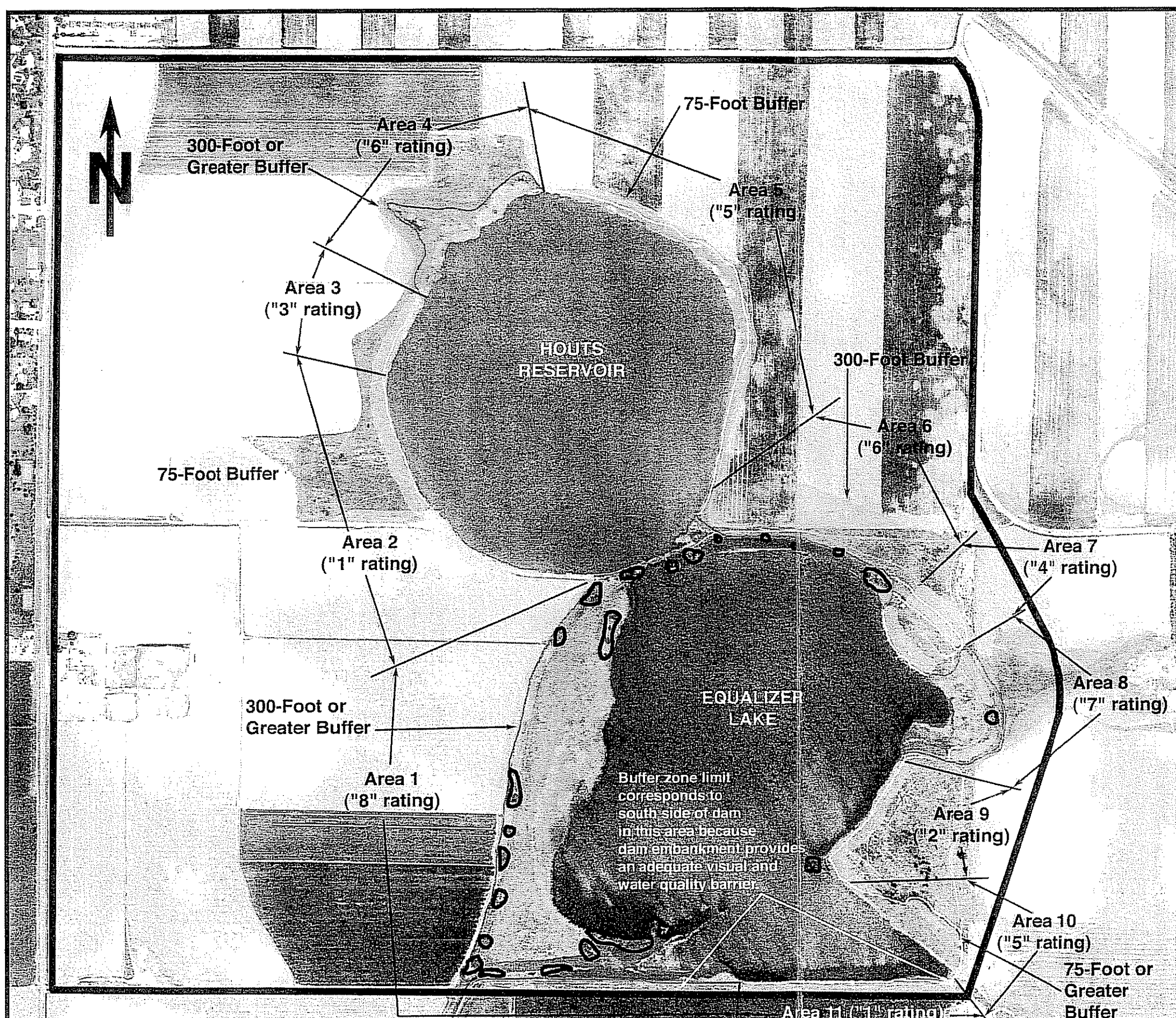

FIGURE 5
Environmentally Sensitive Areas

Rocky Mountain Village III - Central Portion

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Environmentally Sensitive Areas Rated 6 or Higher (Recommend 300-foot buffer from operating high water line)

Environmentally Sensitive Areas Rated 5 or Lower (Recommend 75-foot buffer from operating high water line)

Areas of Mature Trees

Scale: 1" = 600'

Moderate ("3" to "5" ratings), or Lowest ("1" to "2" ratings) habitat quality (see Figure 5) based on the following considerations.

- Highest Quality ("6" to "8" ratings) - Extensive areas (≥ 75 feet wide) with a diversity of dense, herbaceous wetland vegetation (cattails, sedges, grasses, forbs etc.) cover including occasional stands of mature cottonwood and willow trees and some inclusions of natural upland vegetation.
- Moderate Quality ("3" to "5" ratings) - Areas with moderate herbaceous wetland vegetation cover 5 to 75 feet wide intermixed with mudflats and/or mostly young trees and/or shrubs (willows).
- Lowest Quality ("1" to "2" ratings) - Areas with minimal or no wetland vegetation establishment or disturbed shoreline areas such as rip-rapped embankments.

Rankings and boundaries of shoreline/wetland habitats are shown on Figure 5. The characteristics and rationale for the rating of each shoreline area are described in the following sections.

Area 1. This area supports the highest quality and most diverse habitat area around the perimeter of either lake and was assigned a rating of "8." It consists of a broad wetland zone that intergrades with upland grasslands and then is bordered on the western edge by wetlands that have formed in an abandoned segment of the Loveland and Greeley Canal. The current functioning inlet from the Loveland and Greeley Canal is located at the south end of Area 1 at the southwest corner of Equalizer Lake.

Scattered individuals of large, mature plains cottonwoods (*Populus sargentii*) and peach-leaf willow (*Salix amygdaloides*) trees grow at the north and south ends of Area 1 and along the abandoned ditch segment. The wetland/shoreline zone supports a broad, dense stand of common cattail (*Typha latifolia*). Representative vegetation in wetland transition zone between these wetlands and adjacent upland grasslands consisted of foxtail barley (*Hordeum jubatum*), three-square (*Scirpus americanus*), alkali muhly (*Muhlenbergia asperifolia*), showy milkweed (*Asclepias speciosa*), saltgrass (*Distichlis stricta*), sea-blite (*Suaeda depressa*), curly dock (*Rumex crispus*), and common lambsquarters (*Chenopodium album*). Blue grama (*Bouteloua gracilis*), western wheatgrass, crested wheatgrass, and kochia were the dominant species supported in upland grassland habitat between the two wetland areas. Wetlands within the abandoned portion of the Loveland and Greeley Canal were represented primarily by reed canarygrass (*Phalaris arundinacea*), common cattail, coyote willow (*Salix exigua*), and Emory sedge. The old canal segment is a ditch contained within elevated berms that create a water quality and visual barrier between Area 1 and adjacent cropland.

Area 1 supports suitable nesting and foraging habitat for waterfowl and shorebirds, small mammal habitat, songbird nesting and foraging habitat, raptor perch sites and hunting habitat as well as hunting habitat for red fox, coyote, raccoon, and striped skunk. Although a number of the larger trees are of suitable size and configuration to support raptor nesting activity, no evidence of raptor nests (i.e. stick nests, nest cavities, and whitewash accumulations) was noted in any of the larger trees in this area.

Area 2. This area is the lowest rated ("1" rating) lake shoreline area. Most of this area exhibits recent surface disturbance and compacted soils with a high coarse fragment content. There are no wetlands supported in this shoreline segment, and portions have been rip-rapped with concrete blocks. Existing vegetation cover is provided primarily by low-lying annual weeds. Because of the lack of vegetation cover, wetlands, and shoreline mud flats, this area is unsuitable for use by waterfowl, shorebirds, and most other wildlife species.

Area 3. Most of this area consists primarily of disturbed/weedy habitat, although a thin strip (<5-10 feet wide in most places) of wetland vegetation, consisting primarily of common cattail, is also supported along the shoreline zone. This area was given a habitat rating of "3." Vegetation cover provided by the cattail stands as well as the grasses and forbs in the adjacent upland strip may provide sufficient cover to support waterfowl nesting use. The cattail stands, although narrow, have sufficient height to provide a visual barrier between adjacent uplands and waterfowl on the surface of the reservoir.

Area 4. Although no shrub or trees are supported in this area, the wetland zone is relatively broad (≥ 75 feet, and it supports a diversity of herbaceous wetland species. Wetland habitat extends nearly 400 feet from the reservoir edge along a shallow drainage that feeds into this shoreline zone from adjacent uplands (see Figures 4 and 5). Wetlands along the shoreline area consist of dense stands of common cattail, while along the shallow drainage a more diverse mix of cattails and other wetland species such as three-square, Baltic rush (*Juncus balticus*), foxtail barley, sand spurrey (*Spergularia marina*), saltgrass, and reed canarygrass are supported. Area 4 was determined to provide suitable habitat for waterfowl and shorebird nesting and foraging. This area was given a rating of "7" because of the width of the wetland zone, the diversity of wetland vegetation present, and its importance as wildlife habitat.

Area 5. Wetlands in this area consist of dense, stands of cattails intermixed with pockets of mostly bare mudflats. Most wetlands are less than 75 feet in width, and the diversity of wetland vegetation is limited. The narrow wetland transition zone between the cattail stands and adjacent upland cropland supports primarily narrow, linear stands of foxtail barley and reed canarygrass. No shrubs or trees grow along this area. Wildlife use of this area is similar to Area 3 but possibly more extensive because of the broader band of wetland vegetation. A habitat rating of "5" was assigned to this area.

Area 6. This area is mixture of wetlands and open water habitat that has been created by an inoperable portion of the Loveland and Greeley Canal. This portion of the ditch appeared to have supplied water to Equalizer Lake in the past but now has open water connections to the lake and therefore contains surface water at the same level as the lake. Narrow bands of wetland vegetation exist along both of the ditch embankments. Pockets of wetland and upland shrubs such as coyote willow, chokecherry (*Prunus virginiana*), and skunkbush sumac (*Rhus trilobata*) are also supported along the top of the interior ditch

embankment. A few large plains cottonwood trees grow at each end of Area 6 as well. The total width of the wetlands in conjunction with the open water ditch area equals or exceeds 75 feet along most of the length of Area 6. The mixture of a protected open water area in combination with wetlands and shrubs and trees creates a relatively diverse habitat area, and Area 6 was given a rating of "6."

This area was judged to provide nesting, loafing, and foraging habitat for waterfowl and shorebirds; small mammal habitat, songbird nesting and foraging habitat, and raptor perch sites. Although a number of the larger trees are of suitable size and configuration to support raptor nesting activity, no evidence of raptor nests (i.e. stick nests, nest cavities, and whitewash accumulations) was noted in any of the larger trees in this area.

Area 7. This area, like Area 6, also contains a portion of the old Loveland and Greeley Canal but wetland and woody vegetation development along the canal and lake shoreline is much more limited than in Area 7. The central upland portion between the lake shoreline and the canal is a mowed grassland area with little cover or suitability as wildlife habitat. This disturbed/grassland area is used by the Greeley and Loveland Irrigation Company as a picnic area. The adjacent shoreline is used for fishing and boat launching and docking. Area 7 was given a habitat rating of only "4" because of the lack of woody vegetation, minimal wetland development, and human disturbance factors. Wildlife use of Area 7 is limited open-country songbirds and resting and foraging by waterfowl when human disturbance is lacking.

Area 8. This area contains the southern most segment of the inoperable portion of the Loveland and Greeley Canal. It encircles three sides of a small bay on the east side of Equalizer Lake (see Figure 5) and occupies a lower topographic position than Area 7 to the north and Area 9 to the south. As a result, wetland development is much more extensive and diverse in this area. Wetland habitat is nearly continuous for 300 feet from the lake edge to the east side of the canal except for open water portions of the canal and a narrow dirt road that parallels the west side of the canal. Dense stands of common cattail are supported in the more saturated portions of this wetland while coyote willow, Emory sedge, reed canarygrass, blue vervain (*Verbena hastata*) were dominant along the wetland periphery. A large multi-trunked peach-leaf willow tree also grows near the eastern edge of this area (see Figure 5). This area was given a habitat rating of "7" because of the presence of pockets of open water, inclusions of woody vegetation, and the width and diversity of wetlands.

The disturbed/weedy area on the east side of Area 8 (see Figure 4) is of interest because much of this area was delineated as wetland by ENSR in 1997 (*Equalizer Lake Property Wetland Delineation*, October 1997). The site was classified as an "atypical" wetland because it had been farmed and the soil profile disturbed by cultivation. Wetland surveys completed by Cedar Creek in 1998 recorded some sites dominated by wetland associated plants including yellow foxtail (*Setaria glauca*) and foxtail barley in this

area. Other sites were dominated by upland species such as Canada thistle, common sunflower (*Helianthus annuus*), cheatgrass, and horseweed (*Conyza canadensis*). However, Cedar Creek surveys did not find any evidence of hydric soils or wetland hydrology. The situation was discussed with Terry McKee of the U.S. Army Corps of Engineers, and he indicated that the area was probably a wetland/upland transition zone and should be classified as non-wetland based on current evidence that all three criteria (vegetation, soils, and hydrology) for wetland determination were not met.

Area 8 was judged to provide suitable nesting, foraging, and loafing habitat for waterfowl and shorebirds, small mammal habitat, songbird nesting and foraging habitat, and raptor perch sites and foraging habitat. A stick nest of a size and configuration suggesting use by long-eared owl was located in the peach-leaf willow tree in this area.

Area 9. Wetland establishment is minimal to non-existent in this area. Wetlands have not formed in this area because a nearly vertical shoreline embankment (5 to 6 feet high) separates uplands from the operating high water line of the lake. Pockets of wetland (too small to map) have formed only where portions of the shoreline embankment have slumped into lake. This shoreline appears to be subjected to continuous erosion from wave action in the lake. Old car bodies, tractor tires, and crumpled culverts have been placed in the lake shallows, possibly in an effort to slow embankment erosion. This area was given a habitat rating of "2" because of the lack of wetlands and the steep shoreline embankment that limit the suitability of this area as wildlife habitat. Wildlife use of this area is likely restricted to shorebird foraging during periods when lower lake water levels expose shoreline mudflats.

Area 10. The shoreline embankment in this area is also nearly vertical in most areas, but it is lower (4 to 5 feet) in height than in Area 9, and some wetland development has occurred above the embankment edge. A dense stand of young plains cottonwoods is also supported in this area. These trees are relatively even-aged and ranged in size from 4 to 8 inches diameter at breast height (dbh). Total canopy cover within the densest portions of this tree stand was estimated at 75 to 80 percent. Most of this cotttonwood stand grows within the wetland zone, but some portions of the stand are supported outside of the wetland boundary (see Figure 4). Cottonwood stands outside the wetland were included within the area identified as environmentally sensitive (see Figure 5) because these trees add vegetational structural diversity and result in an increase wildlife habitat diversity in this area.

Dominant vegetation species within the wetland portion of this area were plains cottonwood, reed canarygrass, coyote willow, and curly dock. In the non-wetland portion dominant understory species were cheatgrass, Canada thistle, kochia, and crested wheatgrass. This area was given a rating of "5" because of the mix of wetlands and young cottonwood trees that create a diverse but relatively small habitat parcel. This area was judged to be most suitable for use as songbird nesting, perching, and foraging habitat.

There could also be some shorebird foraging use of this area during periods when reduced lake water levels expose shoreline mudflats.

The Loveland and Greeley Canal exits Equalizer Lake at the south end of this area and the southeast corner of the property.

Area 11. This shoreline area is composed primarily of a concrete, rip-rapped dam embankment that supports a very narrow strip of reed canarygrass wetland at its east end. Wetlands are non-existent in the remainder of this area, and overall habitat quality is low because of the dirt packed road surface along the top of the dam and the lack of vegetation cover except for weedy annual species. This area was given a habitat rating of only "1" since vegetation cover and suitable foraging areas are lacking for most wildlife species

Wildlife Use and Corridors

The property is surrounded by roadways and actively cultivated cropland and the only potential movement corridor that connects this property to other natural areas is the Loveland and Greeley Canal. The canal extends from the southeast corner of Boyd Lake to the southwest corner of Equalizer Lake, but its value as a wildlife movement corridor between these two areas is severely limited by surrounding croplands and developments that have restricted the development of any suitable vegetation cover along its entire length. This corridor is also disrupted by Boyd Lake Avenue. Similar constraints exist with respect to the canal's viability as a movement corridor where it exits the southeast corner of the property. In addition, this segment of the canal is interrupted by the I-25 corridor before it reaches the natural area in the southeast corner of the Eastern Portion of the Rocky Mountain Village III development area (see following section).

Habitat suitability for various wildlife groups and species was summarized for each distinct shoreline area in the preceding sections. Although the diversity of wildlife using the area is relatively low during the late fall season when the field surveys were completed, a number of species were observed in association with the two lakes and natural areas around the lake perimeters. Waterfowl use of the area was also probably reduced by the fact that most of Equalizer Lake had been drained at the time of the survey. The area greatest value is in providing important habitat for migrating and summer resident waterfowl and shorebirds. Dave Graves with the Greeley and Loveland Irrigation company indicated that waterfowl use of the lakes is extensive from spring through late fall. Lake margins and marshy areas provide resting and foraging areas for waterfowl, shorebirds, and wading birds, including species such as American white pelican and great blue heron. Waterfowl and shorebirds observed on the lake surface and at lake margins included Canada goose, mallard, northern shoveler, gulls, and killdeer.

Other avian species observed were northern harrier, ring-necked pheasant, short-eared owl, great horned owl, belted kingfisher, northern flicker, hairy woodpecker, American crow, western meadowlark, black-capped chickadee, and song sparrow. Raccoon tracks were noted at several locations around the lake perimeters, and Nuttall's cottontail were seen in rabbitbrush/grassland habitat as well as in disturbed/weedy areas with denser vegetation cover.

Potential or known habitat for three federally listed threatened species exists within the property boundaries. Suitable habitat for Ute ladies-tresses' orchid and Preble's meadow jumping mouse exists along the upland margins of the cattail stands where grass/forb wetlands or moist meadow areas exist, primarily along the west side of Equalizer Lake in Area 1 and along the eastern margin of Area 8. Suitable habitat in Area 8 and the south edge of the Equalizer Lake dam embankment were surveyed for Ute ladies-tresses' orchid by ENSR in 1997 with negative results (*Ute Ladies-Tresses' Orchid Survey Equalizer Lake Property*, October 1997).

Wintering bald eagles use the two lakes for foraging habitat. Wintering bald eagles in the region feed on dead and crippled geese or ducks on open or frozen reservoirs. Large cottonwood trees around the perimeter of Equalizer Lake provide suitable perch sites for these foraging eagles. Dave Graves with the Greeley and Loveland Irrigation Company indicated that trees at the south end of Area 1 are the most frequently used perch sites by wintering eagles.

Eastern Portion

This development parcel is gently sloping to the southwest with a more defined drainage in the southwest corner of the property (see Figures 1 and 6). The property is composed almost entirely of cropland except for the southwest drainage portion and a small wetland depression in the northeast corner (see Figure 6). Areas defined as environmentally sensitive by City of Loveland guidelines are limited to two irrigation ditches (Farmers Ditch and the Loveland and Greeley Canal), the small wetland depression in the northeast corner of the property, and the drainage in the southwest corner of the property (see Figure 7). The drainage in the southwest corner of the property is listed as a Natural Area #99 (with a rating of "7") in *In the Nature of Things, Loveland's Natural Areas* . There are no other drainages, areas of important wildlife habitat, or other Natural Areas (*In the Nature of Things, Loveland's Natural Areas*) in this parcel that would qualify as environmentally sensitive areas.

According to the *Soil Survey of Larimer County Area, Colorado* (SCS 1980), predominant soils in the area include Fort Collins loam, Kim loam, Nunn clay loam, Weld silt loam, and Wiley silt loam. These are not highly erosive soils; runoff is slow to medium and the hazard of wind or water erosion ranges from slight to moderate for these soils. No land formerly used for landfill operations or hazardous industrial use or fault areas were identified on the property. Slopes over 20 percent do exist, however, within the lower

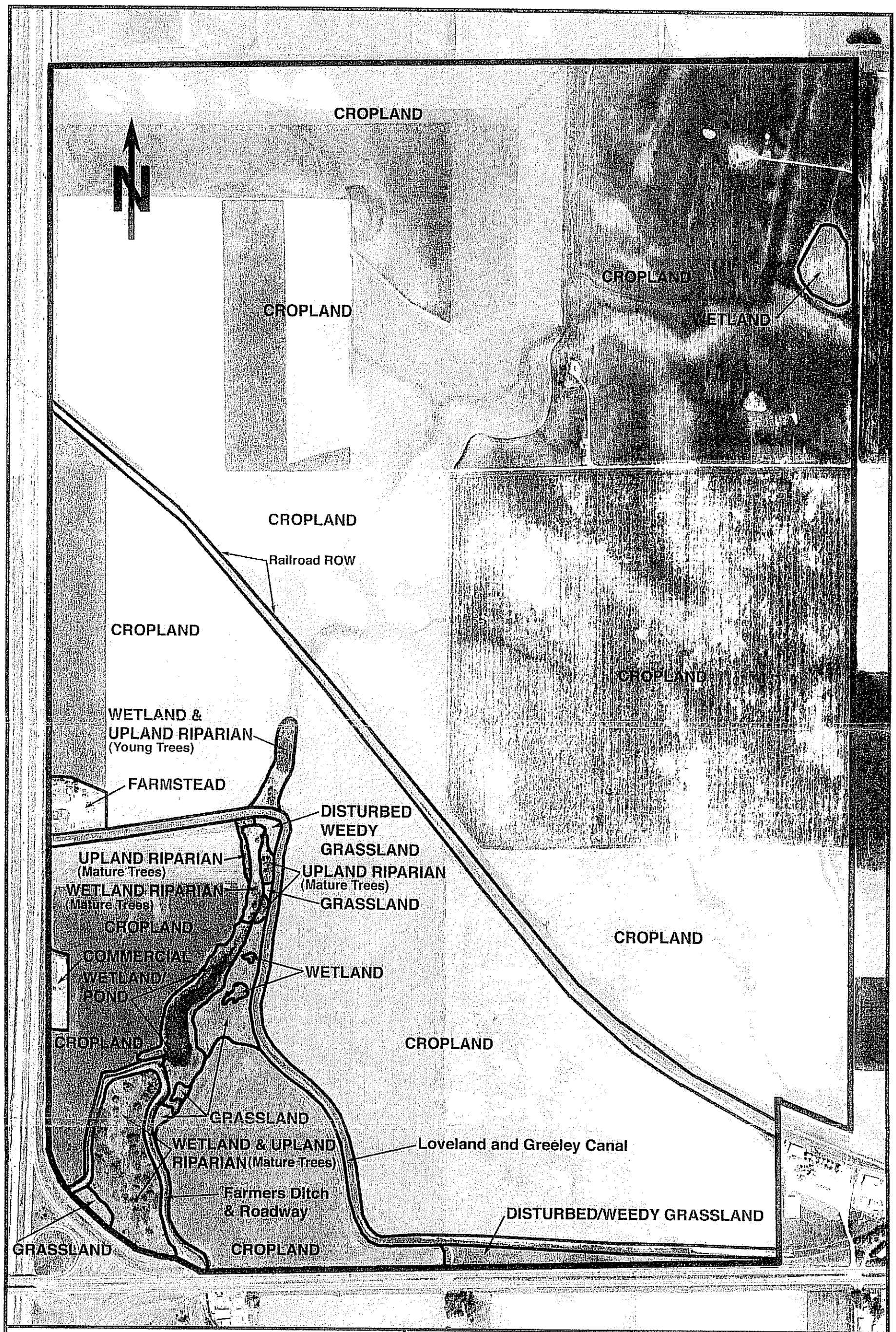

FIGURE 6
Habitat Mapping

Rocky Mountain Village III - Eastern Portion

McWhinney Enterprises

Scale: 1" = 600'

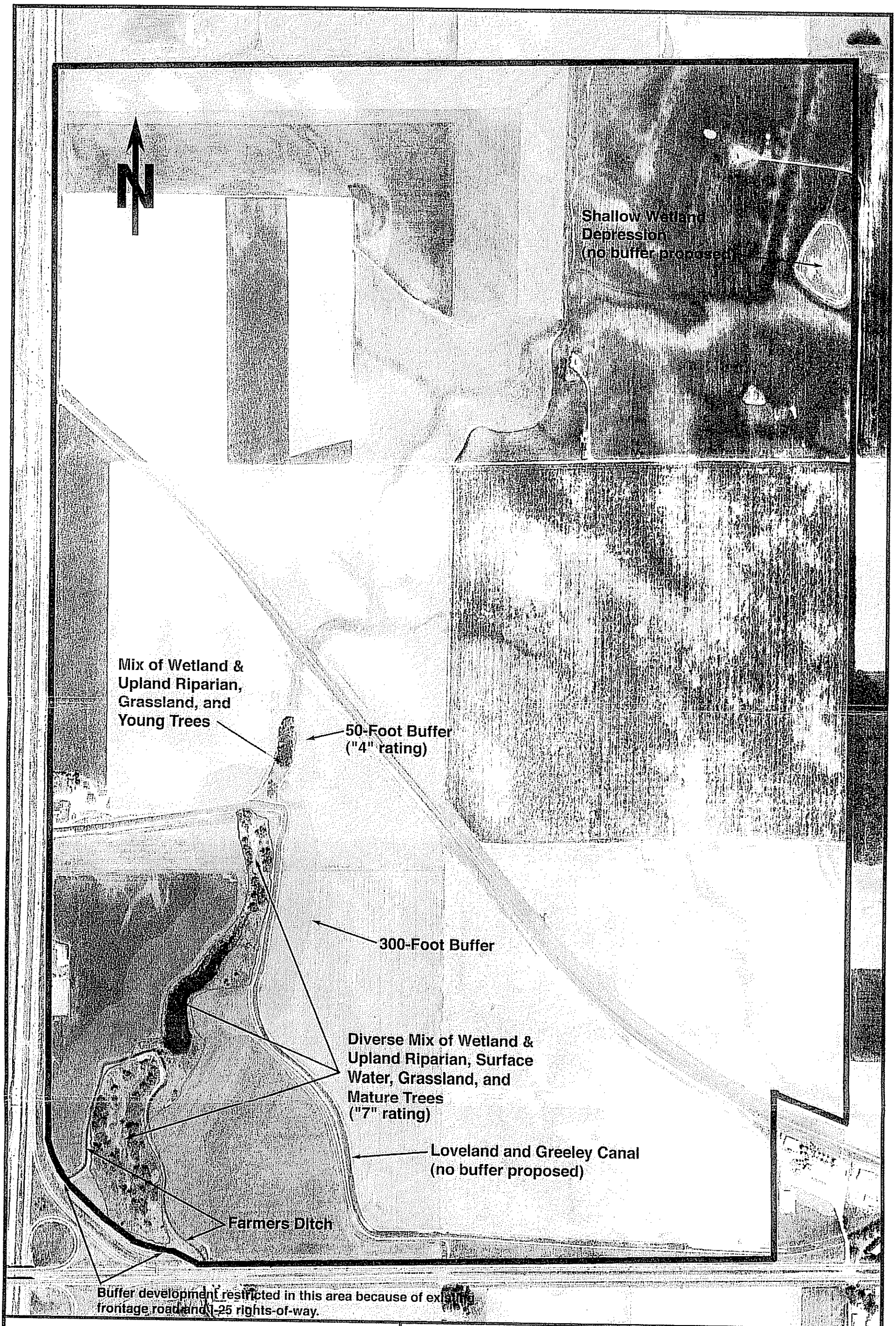

FIGURE 7
Environmentally Sensitive Areas

Rocky Mountain Village III - Eastern Portion

McWhinney Enterprises

Environmentally Sensitive Area Rated 6 or Higher (Recommend 300-foot buffer to protect natural resources)

Environmentally Sensitive Area Rated 5 or Lower (Recommend 50-foot buffer to protect natural resources)

Scale: 1" = 600'

segment of the drainage in Natual Area #99 (see Figure 1). These slopes are confined within the area already defined as environmentally sensitive because of the presence of wetlands and important other habitats.

Wetlands associated with the Farmers Ditch and the Loveland and Greeley Canal were not delineated because wetlands supported in active irrigation ditches are not classified as jurisdictional by the Corps of Engineers. In addition, since active cultivation approaches to the edges of most segments of these ditches and there is minimal vegetation cover, these ditches have little value as wildlife movement corridors or wildlife habitat, except where they are in close proximity to Natural Area #99. The ditches were classified as environmentally sensitive, however, because irrigation ditches are identified as environmentally sensitive areas by City of Loveland guidelines (Appendix D).

Wetlands were located on the property within Natural Area #99 and in a small cropland depression near the northeast property corner (see Figure 6). The northeast corner wetland may not be considered jurisdictional by the Corps of Engineers since it has apparently established as a direct result of irrigation water collection in a depression surrounded by cropland. This wetland has been cultivated in the past, but appears to accumulate too much moisture to support the crops planted on adjacent, more upland sites. Vegetation supported in this wetland included yellow foxtail, smartweed (*Polygonum* sp.), and small pockets of common cattail. Total vegetation cover was relatively sparse (15 to 25 percent), and there was no woody vegetation growing at this site. Although this area was classified as wetland, it has minimal value as wildlife habitat because of small size, seasonal cultivation, minimal vegetation cover, and surrounding cropland.

In contrast, wetlands within Natural Area #99 support a variety of wetland species and the mixture of these wetlands with the existing pond, grasslands, and upland riparian areas create a very diverse wildlife habitat area. Wetland in this area are located along the drainage bottom, around the periphery of the pond, and on side-slopes near the irrigation ditches. Wetlands on the side-slopes have likely been created from seepage from adjacent irrigation ditches and may not be classified as jurisdictional by the Corps of Engineers. These wetlands do create additional habitat diversity within the site, however. Representative wetland species recorded in the more saturated sites and around the pond margins were coyote willow, common cattail, pondweed (*Potamogeton* sp.), watercress (*Nasturtium officinale*), Baltic rush, three-square, Nebraska sedge (*Carex nebracensis*), swamp milkweed (*Asclepias incarnata*), smartweed, and willowherb (*Epilobium* sp.). At less saturated wetland sites, reed canarygrass, teasel (*Dipsacus sylvestris*), clustered field sedge (*Carex praegracilis*), Emory sedge, switchgrass (*Panicum virgatum*), foxtail barley, hemp dogbane, alkali muhly, field mint (*Mentha arvensis*), showy milkweed, and Nuttall's sunflower (*Helianthus nuttallii*) were representative species. In many areas of the lower and upper segments of the drainage, there is also an overstory of mature plains cottonwood and peach-leaf willow.

Upland riparian areas within the drainage support plains cottonwoods, chokecherry, Wood's rose (*Rosa woodsii*), western snowberry (*Symphoricarpos occidentalis*), rubber rabbitbrush, and skunkbush sumac in the overstory and a mixture of native and non-native species such as smooth brome, cheatgrass, western wheatgrass, slender wheatgrass (*Agropyron trachycaulum*), crested wheatgrass, Indian grass (*Sorghastrum nutans*), Canada wildrye (*Elymus canadensis*), Kentucky bluegrass (*Poa pratensis*), Canada thistle, and Virgin's bower (*Clematis ligusticifolia*) in the understory.

The entire drainage area between the Loveland and Greeley Canal and Highway 34 and the I-25 frontage road was included as an environmentally sensitive area with a rating of "7" because of the presence of wetlands and the diversity of wildlife habitat created by the mix of wetlands, riparian uplands, and grassland habitats. An even higher habitat rating would be appropriate for this area if it was not surrounded by croplands and roadways and had some connection to other natural areas.

To the northeast of the Loveland and Greeley Canal, habitat in the drainage is less diverse and vegetation is dominated by young plains cottonwoods (4 to 8 inches dbh) and reed canarygrass in the wetland portion and by young plains cottonwoods and smooth brome in the non-wetland portions. This area was given a lower habitat rating ("4") because of reduced vegetation diversity, its narrow configuration, and adjacent croplands (see Figure 7).

Wildlife Use and Corridors

There are no wildlife movement corridors from natural areas in the Eastern Portion to other natural areas. Potential movement to and from the property along the Farmers Ditch is blocked by I-25 and Highway 34. Active cultivation approaches right up to the edge of the Loveland and Greeley Canal and there is minimal vegetation cover. Potential movement along this ditch is blocked by I-25 at the western property edge and by Highway 34 approximately 2 miles east of the Eastern Portion. The I-25 underpass for the Union Pacific Railroad right-of-way is large enough to permit wildlife passage, but there is minimal cover along the right-of-way between the northeast corner of Boyd Lake and the Eastern Portion as a result of active cultivation along the entire length of this right-of-way segment.

Natural Area #99 supports suitable nesting and foraging habitat for waterfowl and shorebirds, small mammal habitat, songbird nesting and foraging habitat, raptor perch sites and hunting habitat as well as hunting habitat for red fox, coyote, raccoon, and striped skunk. Suitable breeding and foraging habitat for a variety of amphibians and reptiles is also present. Although a number of the larger trees are of suitable size and configuration to support raptor nesting activity, no evidence of raptor nests (i.e. stick nests, nest cavities, and whitewash accumulations) was noted in any of the larger trees in this area.

Wildlife species observed during the field surveys included mallard, red-tailed hawk, American kestrel, great horned owl, belted kingfisher, northern flicker, blue jay, black-billed magpie, American robin, western meadowlark, black-capped chickadee, American goldfinch, and Nuttall's cottontail

Potential habitat for two federally listed threatened species exists within Natural Area #99. Suitable habitat for Ute ladies-tresses' orchid exists along the margins of cattail stands and other saturated areas where wetland vegetation cover is less than 2 feet tall. Suitable habitat for Preble's meadow jumping mouse exists along the upland margins of wetlands where grass/forb wetlands or moist meadow areas exist, especially along the west side of the drainage.

Wintering bald eagles could perch in the large cottonwoods along the drainage, but surrounding croplands and highway corridors do not provide suitable winter foraging habitat for bald eagle.

IMPACTS OF DEVELOPMENT AND MITIGATION RECOMMENDATIONS

Specific development plans were not available at the time of report preparation, but a general assessment of potential impacts to environmentally sensitive areas can be made based the development envelopes proposed in the General Development Plan (GDP).

Western Portion

Impacts. The south half of this development parcel is proposed for residential development while the north half would be developed to commercial retail and a residential park. None of the proposed developments would directly affect environmentally sensitive areas in the Outlet Ditch or Natural Areas #14 and #15 to the south of the development. Indirect impacts could occur as a result of surface water runoff from developed sites into the Outlet Ditch or Natural Areas #14 and #15. The loss of irrigation water application on the property could also have an effect on wetlands in Natural Areas #14 and #15.

The Outlet Ditch has an elevated berm along most of its length, and it is unlikely that surface runoff from developed areas would reach the ditch and affect water quality, especially if Best Management Practices (BMPs) are employed to control runoff during and after construction. There is the potential that irrigation may provide some surface water recharge to wetlands in Natural Areas #14 and #15, and that loss of this water may result in drier conditions in these wetlands. **However, this potential impact is unlikely since County Road 9E currently prevents any surface flow off the property from reaching Natural Areas #14 and #15. No data on groundwater conditions are available for this area, but it is assumed that subsurface recharge must support the wetlands in Natural Area #15 since there is no up gradient surface flow connection to this area because of the presence of County Road 9E. The most likely source of this**

subsurface recharge would be from Natural Area #14. Wetlands in Natural Area #14 appear to be supported primarily from surface flow and seepage from the Outlet Ditch. Project development would have no effect on hydrologic conditions and wetlands in Natural Area #14 since flow from the Outlet Ditch would be maintained to this area.

Mitigation. In order to further protect wetlands and trees in the Outlet Ditch and urban wildlife use of this ditch, a minimum setback of 50 feet is recommended from the **top of the existing ditch embankment** (see Figure 3). A 50-foot buffer is sufficient to protect water quality in the ditch since the edges of the ditch are bermed. Development should not intrude into the buffer zone, but a footpath or trail system would be appropriate for this corridor. The buffer zone should be planted, at a minimum to self-sustaining grass cover. Plantings of native grasses and shrubs would further enhance the corridor as wildlife habitat for urban adapted species.

If road crossings are required over the Outlet Ditch, these crossings should avoid areas in the ditch that support trees. Culverts under **any new roadways over the ditch** should be sized to permit wildlife movement along the ditch.

There are limited opportunities for enhancement or impacts to Natural Areas #14 and #15 because of separation by County Road 9E. A 75-foot setback **from the west and north edges of County Road 9E** is recommended to minimize an abrupt shift from these natural areas to development. However, creation of attractive natural areas within this buffer may not be appropriate. Creation of natural areas on the west and north sides of County Road 9E would encourage wildlife movement across County Road 9E and increase the risk of wildlife road-kills. **Plantings of turf grass in this buffer area would be appropriate, but plantings of trees and shrubs should be emphasized to provide some visual screening between development sites and Natural Areas #14 and #15.**

No mitigation is proposed for the Farmer's Ditch since this ditch is not a suitable wildlife corridor and it provides minimal wildlife habitat.

Detailed preliminary design plans will be prepared to address each sensitive area, required buffers, mitigation measures, and road crossing recommendations. These plans will be prepared prior to, or in conjunction with, the approval of a Preliminary Plat for any building lots or development features adjacent to or within 300 feet of identified sensitive areas.

Central Portion

Impacts. The area to the west of the lakes is proposed for residential development, while the area to the east of the lakes is proposed for commercial development. None of the proposed developments would directly affect the lakes or environmentally sensitive habitats identified around the lake perimeters. Indirect impacts to wildlife use of these areas could occur from increased human presence and recreational use of the lakes and shoreline habitats.

Erosion, runoff, and general disturbance from construction may produce some indirect, temporary impacts on water quality in the lakes and adjacent wetland / shoreline habitats if erosion is unchecked. However, standard construction mitigation measures and BMPs such as fabric silt fences, catchment basins, hay bales, berms, and other standard sediment and surface runoff control measures should be sufficient to prevent any substantial sediment transport or liquid spills into the lake or shoreline areas.

Depending on surface configuration after final grading and other factors such as street alignment, street runoff and nutrient-laden runoff from fertilized lawns could flow into shoreline / wetland areas and may alter the water quality of Houts Reservoir and Equalizer Lake. However, overall water quality of surface runoff into the lakes should be improved because of the following.

- Watering for residential and commercial landscaping would require a reduced volume of water over current agricultural irrigation practices.
- Reduced quantities of agricultural chemicals would be used for landscaping as opposed to existing croplands.
- Recommended setbacks (see below) from the operating high water lines and proposed developments will be sufficient to intercept and retain sediment and potentially toxic substances (e.g. herbicides, pesticides, etc.) in sheet flow runoff from developed sites.

Mitigation. In order to further protect wetlands, mature trees, and other environmentally sensitive areas around the lakes, development setbacks of 75 to 300 feet or more are recommended from the operating high water lines of the lakes (see Figure 5). These recommendations are consistent with or exceed guidelines provided for lake shoreline setbacks provided in *City of Loveland Open Lands Plan* (Open Lands Steering Committee et al. 1996). Proposed setbacks would also protect any potential habitat for bald eagle, Ute ladies-tresses' orchid, and Preble's meadow jumping mouse.

Lake access should only be permitted in shoreline areas with minimal or no wetlands, and recreational trail systems should avoid the higher rated wildlife habitat areas. Free-roaming pets should be prohibited and lease laws strictly enforced along trail systems to minimize dog and cat/wildlife interactions.

More specific recommendations for each rated shoreline segment are provided in the following sections.

- Area 1. A setback of 300 feet or more is recommended for this area. The setback should correspond to the western edge of the abandoned Loveland and Greeley Canal. This ditch has elevated berms that create good visual and water quality barriers between the natural areas and proposed development sites. **Additional setbacks may be employed from the outside edge of the ditch, but these setbacks are not necessary to protect important habitat features within the recommended buffer zone. The recommended buffer would also be sufficient to protect potential Preble's meadow jumping mouse habitat within the natural area since suitable habitat ends abruptly in the abandoned ditch. Prohibition of free-roaming pets within the buffer zone and adjacent areas would preclude any potential indirect impacts to Preble's meadow jumping mouse from predation by pets.** Because of the high quality of wildlife habitat in this area, there should be no development of trail systems within the buffer zone. Selective placement of one or two short lengths of elevated boardwalk for wildlife viewing and education may be appropriate, **but siting and construction of any boardwalks should be carefully planned in coordination with natural resource experts to avoid impacts to areas of highest quality and important wildlife use areas. No other developments or park features should be considered for this buffer zone.**

  Where possible, plantings of a mixture of native upland vegetation and more formal landscaping would be suitable for additional development setbacks in this area. Trail and recreational site development would be appropriate for the area between the buffer zone and developed sites. **Interpretative and educational signs should be placed at regular intervals along the outside edge of the buffer zone. The signs should stress the need for no human intrusion into important habitat areas. The placement of split-rail or similar type of fencing with wire mesh along the lower portion may also be necessary along the buffer edge to further discourage intrusion by humans and pets.**

- Area 2. Because of the low habitat quality of this shoreline area, this would be the best area on Houts Lake to develop more formal recreational facilities such as picnic areas and docks for non-motorized boat use. The 75-foot buffer zone should be planted to native vegetation or landscaped to protect lake water quality. **Because wildlife habitat quality is low along this area and other areas designated by yellow on Figure 5, buffer recommendations are directed primarily at protecting water quality in both lakes rather than preserving wildlife habitat. Therefore, buffers proposed for yellow designated areas are not intended to limit all human intrusion or developments. Limited trail development, human recreation activities, and the integration of detention and other storm management features would be appropriate within the proposed 75-foot development setbacks.**

  Trail development could connect the two 75-foot development setback at the south end of Houts Reservoir via the dam between Houts and Equalizer. The dam faces consist primarily of rip-rap with minimal wetland or other habitat development. The dam is currently used as a road crossing for use in dam maintenance and operation by the Greeley and Loveland Irrigation Company. This use is likely to continue, and occasional pedestrian use of this road as a trail is unlikely to create additional adverse impacts to wildlife use of the area. One exception is that bald eagles may use the large cottonwood trees in the vicinity of the dam for winter perch sites while foraging at the two reservoirs. In this situation it would be appropriate to place a seasonal restriction on pedestrian use of this segment of the trail so that disturbance to bald eagle winter perch sites would be avoided.

- Area 3. A setback of 75 feet is recommended for this area. This would be an appropriate area for establishment of shoreline platforms for wildlife viewing. Platforms should be designed similar to a blind so that wildlife viewing is not disruptive to waterfowl on the lake surface. This area could also have trail or recreational site development outside of, but adjacent to, the buffer zone. Existing vegetation within the buffer zone should be maintained. Existing disturbed areas or areas dominated by annual weeds should be replanted to native upland vegetation.

- Area 4. A setback of 300 feet or more is recommended for this area. There should be no development intrusion into the buffer zone, but trail development within the buffer zone but outside of the wetland areas would be appropriate. Current cropland portions of the buffer zone should be planted to native upland vegetation.

- Area 5. This shoreline zone is similar to Area 3 and the same recommendations would apply to this area.

- Area 6. A setback of 300 feet is recommended for this area. It is recommended that no development occur in the buffer zone except for **trail** construction outside of the wetland areas. Existing vegetation within the buffer zone should be maintained. Existing cropland areas within the buffer zone should be replanted to native upland vegetation.

- Area 7. A setback of 75 feet is recommended for the shoreline zone and ditch wetlands in this area. Because of past use of this area as an undeveloped recreational site, this would be an appropriate area for development of a picnic area and similar recreational facilities. Docks for non-motorized boating use of this lake are not recommended because of the extent and quality of wetlands and waterfowl nesting habitat around the perimeter of Equalizer Lake. It is recommended that boat use be restricted to Houts Reservoir and that Equalizer Lake be maintained primarily as waterfowl and shorebird habitat.

- Area 8. A setback of 300 feet is recommended for this area. Because of the high diversity of wetlands and pockets of open water habitat in this area, this area represents high quality waterfowl nesting, resting, and foraging habitat. It should be preserved with no trail disturbance or other development intrusions. **The 300-foot buffer would be sufficient to protect wetlands and potential Preble's meadow jumping mouse habitat to the west of the ditch and narrow peripheral wetlands on the east side of the ditch. Currently cropland disturbance encroaches right up to the edge of existing wetlands. Native revegetation for this area is proposed only for those portions of the buffer zone that have been disturbed by cultivation. No revegetation measures are recommended for delineated wetland areas or other undisturbed sites within the buffer area.**

- Area 9. A setback of 75 feet is recommended for this area. **As indicated on Figure 4 this area currently supports rabbitbrush / grassland. The areas appears to have had some surface disturbance in the past but is currently returning to a mostly native dominated community. It is recommended that existing vegetation be maintained in the buffer zone and left to continues to progress naturally toward a native community. However, supplemental plantings of native shrubs and trees would be appropriate for this area.** This would be another **suitable** area for adjacent development of recreational facilities such as picnic areas or trails.

- Area 10. A buffer zone of 75 feet or more is proposed for this area. The 75-foot buffer zone should be extended to include the cottonwood tree stands in this area. Trail development would be appropriate in this area but trail placement should avoid tree removal. However, some selective thinning of trees may be necessary in denser portions of the tree stand to improve stand vigor.

- Area 11. No specific recommendations are provided for this area because of poor habitat quality and because dam maintenance and operation would preclude any development or enhancement measures. **Pedestrian movement across this area to access trail systems to be established on both sides of Equalizer Lake would be suitable recreational use in this area as long as a trail would be compatible with dam maintenance and operation by the Greeley and Loveland Irrigation Company. The dam faces consist primarily of rip-rap or disturbed weedy soil surfaces with minimal wetland or other habitat development. Trail design, barrier placement, and educational signs would be used to prevent human intrusion into higher quality habitat areas (red zone in Figure 5) on the west side of the reservoir.**

Detailed preliminary design plans will be prepared to address each sensitive area, required buffers, mitigation measures, native plantings, educational features, viewing platforms, and trail design as well as long-term maintenance and management of sensitive natural areas. These plans will be prepared prior to, or in conjunction with, the approval of a Preliminary Plat for any building lots or development features adjacent to or within 300 feet of identified sensitive areas. Specifications for native revegetation planting schedules, soil preparation, weed control, irrigation needs, etc. will also be provided at this time.

Eastern Portion

Impacts. This area is proposed for commercial, manufacturing, and light industrial development. None of the proposed developments would directly affect Natural Area #99. The small wetland depression in the northeast corner may be lost to development, but this would have little effect on important wildlife habitats since the existing wetland has minimal wildlife habitat value. This depression may have some potential for creation of more extensive and higher quality wetlands if the site needs to be developed for surface water detention.

Indirect impacts to wildlife use of Natural Area #99 could occur from increased human presence and recreational use.

Erosion, runoff, and general disturbance from construction may produce some indirect, temporary impacts on water quality in Natural Area #99 if erosion is unchecked. However, standard construction mitigation measures and BMPs such as fabric silt fences, catchment basins, hay bales, berms, and other standard sediment and surface runoff control measures should be sufficient to prevent any substantial sediment transport or liquid spills into this area.

Depending on surface configuration after final grading and other factors such as street alignment, street runoff and nutrient-laden runoff from fertilized landscaped areas could flow into wetland areas in Natural Area #99 and may alter the water quality in the existing pond.

Mitigation. In order to further protect wetlands, mature trees, and other natural habitats within Natural Area #99, a development setback of 300 feet from important habitat areas is recommended (see Figure 7). This setback would be sufficient to protect water quality in the drainage and wildlife use of the area. A development setback of 300 feet is the general recommendation of the City of Fort Collins and the Colorado Division of Wildlife to protect important waterfowl habitat and is also sufficient to minimize disturbance to songbird nesting habitat and raptor perch sites. Proposed setbacks would also protect any potential habitat for Ute ladies-tresses' orchid and Preble's meadow jumping mouse. A setback of 300

feet is the current guideline used by the U.S. Fish and Wildlife Service for protecting known habitat areas of Preble's meadow jumping mouse.

The portion of the drainage north of the Loveland and Greeley Canal received a much lower habitat rating, and a 50-foot buffer is recommended to protect existing vegetation and wetlands in this area. It is recommended that no development occur within the 50-foot buffer but the creation of trails or picnic areas would be appropriate within or near this buffer zone.

It is recommended that there be no intrusion by trails or other recreational facilities within the red-lined zone (see Figure 7). A foot path or trail system around the perimeter of the red-lined zone but within the buffer zone would be appropriate. No other development should occur within the buffer zone, and this area should be planted and maintained to create and adjacent area of native upland habitat to maintain the integrity of the buffer zone and increase habitat diversity in the area.

Detailed preliminary design plans will be prepared to address each sensitive area, required buffers, mitigation measures, native plantings, and trail design as well as long-term maintenance and management of sensitive natural areas. These plans will be prepared prior to, or in conjunction with, the approval of a Preliminary Plat for any building lots or development features adjacent to or within 300 feet of identified sensitive areas. Specifications for native revegetation planting schedules, soil preparation, weed control, irrigation needs, etc. will also be provided at this time.

Since only commercial developments are proposed for the Eastern Portion, free-roaming cats and dogs should not be a significant problem to wildlife in Natural Area #99. However, lease laws should be strictly enforced along developed trail systems to minimize dog and cat/wildlife interactions.

No mitigation is proposed for the Loveland and Greeley Canal since this canal is not a suitable wildlife corridor and it provides minimal wildlife habitat.

RESUME OF REPORT PREPARER

CEDAR CREEK ASSOCIATES, INC.

T. MICHAEL PHELAN

EXPERIENCE ABSTRACT

Employed since 1974 as an environmental consultant. Responsibilities include service as corporate officer, project manager, permitting specialist, wildlife ecologist, vegetation survey technical assistant, and technical editor. Project management activities include client/agency liaison, project risk analyses, interdisciplinary coordination, subcontractor supervision, personnel management, cost control, and quality assurance.

Career accomplishments include authorship of, or technical contribution to:

45 EIS/EA Documents • **75** Wetland Delineations/Evaluations • **8** Mine Permit Reviews/Revisions • Permit Strategy Development/Preparation for Numerous Projects • **80** Wildlife Baseline or Monitoring Studies/Technical Sections • **50** Threatened and Endangered or "High Federal Interest" Wildlife Species Studies • Over **100** Wildlife Surveys Emphasizing Big Game, Raptors, Waterfowl, or Upland Game Birds • **32** Wildlife Impact Assessments • **27** Wildlife Mitigation/Habitat Management Plans • **7** Biological Assessments • **10** Vegetation Surveys • **3** Published Wildlife Manuals, **2** for the USFWS and **1** for the Office of Technology Assessment, U.S. Congress

Types of projects have included:

Hard Rock Mines • Coal Mines • Wetland Delineations/Enhancement • Corridor Analyses • Water Developments • Oil, Gas, and Synfuels Projects • Abandoned Mines • Power and other Industrial Plants • Timber Harvest • Housing Developments

Involved in over **200** projects including work in:

Rocky Mountains • Desert Southwest • Pacific Northwest • Intermountain Region • Northern Great Plains • Appalachia • Alaska • California • Missouri • Kansas • Oklahoma • Texas

EDUCATION AND CERTIFICATIONS

B. A., Zoology, University of California, Los Angeles, 1971
Post-graduate Studies, Biology and Ecology, San Diego State University, 1972-1974
Certified Wildlife Biologist - The Wildlife Society
Certified in Habitat Evaluation Procedures (HEP) - U.S. Fish and Wildlife Service
Certified in Black-footed Ferret, Southwestern Willow Flycatcher, and Preble's Meadow Jumping Mouse Survey Techniques - U.S. Fish and Wildlife Service
Desert Tortoise Survey and Examination Techniques

EMPLOYMENT HISTORY

Cedar Creek Associates, Inc. - 1982 to Present
Environmental Research and Technology, Inc. - 1976 to 1982 (presently ENSR Corporation)
Self-employed Environmental Consultant - 1974 to 1976

REPRESENTATIVE CLIENTS

Atlantic Richfield Co. (CO) • Atlas Minerals, Inc. (OR) • BHP-Utah International Inc. (UT) • Carlota Copper Co. (AZ) • Chevron Shale Oil Co. (CO) • Cities of Boulder, Fort Collins, and Loveland (CO) • Diamond Shamrock Corp. (AK) • Energy Fuels Co. (CO, SD) • Exxon Minerals Co. (NM) • FMC Corp. (NV, WY, MT) • Freeport Gold Co. (NV) • Getty Mining Co./Twentymile Coal Co. (CO) • Getty Oil Co. (CO) • Homestake Mining Co. (NV) • Kensington Venture (AK) • Koppers Co. (TN) • LAC Minerals, Inc. (NV) • L. Berger/Federal Bureau of Prisons (CO) • Meridian Minerals Co. (SD, CA, ID) • Montana DEQ (MT) • Newmont Gold Co. (OR, NV) • North American Coal Co. (ND) • Northern Border Pipeline (IA) • Office of Technology Assessment, U.S. Congress (Western U. S.) • Peabody Coal Co. (AZ, CO, WY) • Rocky Mountain Energy Co. (WY) • Simons, Li & Associates, Inc. (CO, UT, WA, Africa) • TerraMatrix Inc./ACZ (CO, NV, UT, WA) • U.S. Bureau of Land Management (MT, NV, UT) • U. S. Fish and Wildlife Service (Western U.S., WVA) • U.S.Forest Service (AK, CO, ID, MT, NV, WA) • U.S. Sprint (CA, OR, WA) • Utah Division of Oil, Gas and Mining (UT) • Western Area Power Administration (CO, NE)

EXPERIENCE SPECIFICS

Mr. Phelan's education and several years of environmental and regulatory compliance experience has facilitated his development of specialized multi-disciplinary skills for projects in mining (coal, hard rock, and synfuels), industrial and urban developments, corridor assessments, wetland evaluation and restoration, and water developments. Areas of expertise include permitting and project management, wildlife ecology, wildlife impact assessment and mitigation planning, habitat evaluation and enhancement, range ecology, bond determination, report/permit document preparation, literature review, and technical editing.

PERMITTING AND PROJECT MANAGEMENT. Mr. Phelan has been actively involved in all phases of permit development. Permitting and management responsibilities have included personnel scheduling and management, strategy formulation, client/agency liaison, regulatory compliance evaluation, subcontractor supervision, cost control, quality assurance, and technical document editing for a variety of projects, including development of, or input to, mine permit applications and NEPA compliance documents (EAs and EISs). In addition, Mr. Phelan has successfully reviewed, edited, and revised sections of mine permit applications to achieve compliance for applications previously submitted by other firms and deemed inadequate by the regulatory agency. Mr. Phelan's permitting experience and related interactions with regulatory agencies for development projects and associated permit submittals have provided him with a working understanding of the policies and regulations of state and federal agencies such as the BLM, COE, OSMRE, WDEQ, CMLRD, UDOGM, USFS, USFWS and NRC, among others. Mr. Phelan's project management experience has been gained on projects ranging from single discipline to large interdisciplinary studies for mining and other development projects.

WILDLIFE ECOLOGY. Mr. Phelan has completed wildlife studies for a wide range of projects including: hard rock mines, surface and underground coal mines, synfuel developments, wetland assessments and restoration, corridor analyses, water developments, abandoned mines, and municipal disturbances. Technical capabilities include: baseline inventories; habitat assessment and restoration; wetland delineation; evaluation of threatened and endangered species populations; wildlife impact assessment and mitigation planning; literature review, and authorship of wildlife technical manuals. Wildlife mitigation plans prepared by Mr. Phelan have emphasized restoration and mitigation for wildlife habitats in desert, rangeland, shrubland, woodland, subalpine, and wetland ecosystems. Specific areas of concern addressed by these plans have included raptor nesting habitat, upland game bird and waterfowl breeding and nesting areas, big game winter range, and critical habitat for threatened and endangered species as well as species of "High Federal Interest." Beyond the capabilities listed above, Mr. Phelan's technical skills include the design and implementation of: big game aerial surveys, big game browse utilization transects, aerial and ground surveys for raptor nests, daytime and night spotlight surveys for black-footed ferrets, other predator inventories, small and medium-sized mammal trapping, avian strip transects, surveys for migratory birds of "High Federal Interest," upland game bird breeding and nesting surveys, waterfowl counts and nesting surveys, wetland mapping and habitat evaluation, herpetofauna surveys, aquatic sampling studies, and tissue sample collection for trace element analysis. In addition, Mr. Phelan has reviewed and analyzed mitigation options for waterfowl mortality on toxic mine tailings ponds.

RANGE ECOLOGY. Technical capabilities in this field include photo interpretation/community mapping and field measurement of plant density, ground cover, plant composition, and current annual production. Mr. Phelan has participated in the design and establishment of revegetation test plots constructed to determine the effects that season of seeding, slope, species selection, and seedbed material characteristics would have on revegetation success. He also has been involved in soil sampling projects to assess soil characteristics and nutrient levels.

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