WILDLIFE ISSUES ASSOCIATED WITH

BUFFALO MOUNTAIN RANCH AND

SILVER MOUNTAIN VILLAGE,

TOWN OF SILVERTHORNE, SUMMIT COUNTY, COLORADO

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1.0 INTRODUCTION

Buffalo Mountain Ranch (BMR) is a 497 acre property located on the east side of the Blue River, just north of the Town of Silverthorne (Town), in Summit County, Colorado. The property is composed of the historic 192 acre Clark and 279 acre Heitt Ranches, and a 26 acre parcel Known as the Oxbow. Seminole Land Holdings. Inc. and Ranch Acquisitions, LLC (proponents) propose to annex portions of these ranches that are now in the County into the Town and develop it into a residential golf course community. Silver Mountain Village (SMV) is the working name for a proposed residential/ commercial development on the 85 acre Smith Ranch, an active agricultural operation currently mostly outside the Town's jurisdiction, but otherwise surrounded by Town developments.

At the request of the proponents, Western Ecosystems, Inc. has conducted a wildlife analysis of the above properties and surrounding area. Herein, substantive wildlife issues associated with the proposed developments are identified for consideration in the Master Planning and PUD processes. Potential wildlife conflicts may be avoided, minimized, and/or minimized via design modifications to the proposals and the subsequent development and implementation of one or more Wildlife Mitigation and Enhancement Plans.

2.0 METHODS

Current (August 1997) CDOW Wildlife Resource Information System (WRIS) maps, associated narratives, and disclaimers were reviewed for the property and surrounding area to identify important wildlife seasonal ranges and features that may be influenced by the project. Field surveys of the property were conducted on October 5 and November 24, 1998. Surveys concentrated on habitat mapping, developing an ecological understanding of the property, and ground-truthing CDOW WRIS maps. A meeting was held with Mr. Tom Kroening, local CDOW District Wildlife Manager on January 5, 1999, to identify the full range of wildlife issues that might be associated with the two properties.

3.0 PROPOSED DEVELOPMENTS

Brief descriptions of the conceptual BMR and SMV developments are provided below. More detailed descriptions are provided in the proponent's March 1999 Master Plan submittal to the Town.

3.1 BUFFALO MOUNTAIN RANCH

BMR is composed of the historic 192 acre Clark and 279 acre Heitt Ranches, and the 26 acre Oxbow parcel. Part of the Clark Ranch is part of the Eagles Nest PUD, Phases II and V. Eagles Nest was master planned and went through PUD approvals up to Phase II, before the originals developers failed and the property was split into three ownership parcels. The Master Plan and Preliminary PUD approved for Phase II of property in the early 1980's permitted dense residential development (400-500 total units), multifamily structures, and a 350 room convention hotel. The Phase V part of the property has not been platted, but was master planned (recorded June 29, 1984) to establish zoning. However, none of this development was initiated. The remainder of the Clark Ranch is in the County, zoned for 1 unit/ 20 acres. Heitt Ranch is entirely within the County and similarly zoned for 1 unit/ 20 acres.

The proponents are seeking as total of 210 single family homes clustered in pods around an 18 hole golf course and 90 units in a lodge configuration at the clubhouse. Approximately 50% of the property would remain as open space, including native habitats, recreational facilities, and the golf course. This represents a considerable down zoning from what was previously approved on the properties now composing BMR.

3.2 SILVER MOUNTAIN VILLAGE

SMV is the working name for the 75 acre Smith Ranch, an active agricultural operation located along the west side of Highway 9 between Willow Brook Subdivision (to the north), Ruby Ranch (to the west), and commercial/multifamily residential development (to the south). Approximately one acre is zones commercial and the remainder is zoned agricultural.

The proponents included SMV in the submittal intending to meet a number of Town objectives on the property, including affordable housing, commercial space, a school site, parks, and other neighborhood amenities in a convenient setting that would exploit existing infrastructure.

4.0 WILDLIFE ISSUES

This analysis is based on CDOW WRIS mapping, limited field surveys of the BMR and SMV properties, more extensive surveys in the surrounding valley, and conceptual descriptions of proposed developments. The substantive wildlife issues described below are generally presented in decreasing order of biological significance. As previously mentioned, potential wildlife conflicts may be avoided, minimized, and/or minimized via the subsequent preparation and implementation of a Wildlife Mitigation and Enhancement Plan, developed through consultation with the CDOW. Potential conflicts and other wildlife issues not discussed at length in this report (e.g., building envelopes, clustering development, fencing, dog and trash provisions, educating homeowners, etc.) have been or will be discussed with project planners and addressed in sufficient detail in a Wildlife Mitigation and Enhancement Plan. Other issues (e.g., protection of wildlife values associated with jurisdictional wetlands) will be adequately resolved by other parties.

4.1 BUFFALO MOUNTAIN RANCH

4.1.1 ELK

Despite BMR's proximity to the Town, the property supports a moderate amount of seasonal elk (*Cervus elaphus*) use, primarily because of the property's large size and valuable foraging and cover habitats at a relatively low elevation in the valley, but also because the agricultural operation is largely compatible with elk use. Elk seasonal range use is described below. CDOW seasonal range definitions are provided in Appendix 8.1.

Summer Concentration Area

CDOW WRIS maps define the lower boundary of an elk summer concentration area extending onto the upper elevations of the property. The validity of this delineation was unable to be verified by field surveys conducted to date, however, with the exception of the Ptarmigan Peaks Trail, human uses in this area, including the agricultural operation on BMR, would not preclude such summer elk use. This property may be more appropriately considered elk summer range. Regardless of the specific summer range designation, such elk use would be eliminated on the property with the proposed development. However, off-site impacts towards the core of this summer range or summer concentration area could be minimized by limiting additional trail development off the property and onto the National Forest, educating homeowners about the issue, implementing and enforcing dog control measures, and implementing seasonal use restrictions that would preclude impacts to habitats on the Forest.

Calving

No designated elk calving habitat occurs on BMR. The closest calving polygon occurs just to the north of the property on what has been developed as Hamilton Creek Subdivision. Because of the compatibility of the existing agricultural operation, it is possible that a low level of elk calving could occur on some of the more isolated portions of BMR that are not used by livestock between May 15 and June 15. This should be explored prior to finalizing the development plan. In the meantime, prohibiting public access and any additional trail development onto the Forest from the PUD, educating homeowners, implementing dog control measures, and seasonal use restrictions would preclude impacts to the more extensive and important elk calving habitats that could occur adjacent to the property.

Highway Crossings and Migration

CDOW WRIS maps show a designated highway crossing across I-70, between Ptarmigan Ranch and Dillon Valley, to the northeast of BMR. With increasing development on both of these properties, this crossing point may be shifting east. Regardless, it is becoming increasingly dysfunctional because of traffic volumes. Proposed development on BMR would likely have no effect on highways crossings, other than as part of the

cumulative effect of winter range losses potentially forcing animals to cross highways in search of undeveloped winter range (see the winter range discussion, below).

BMR is not part of any designated or known migration corridor. The general fall pattern of elk migration in the vicinity of BMR is downhill, then toward the more extensive winter ranges down the Blue River Valley. This general pattern is reversed in spring. During years with heavy early snowfall, increasing snow depths may force elk down onto BMR before they head north down the valley. The residential component of proposed BMR development will impose restrictions (but not barriers) to local and migratory movements, but will not disrupt or jeopardize the overall migration pattern. Golf course development through the property will provide de facto movement corridors.

Winter Range, Winter Concentration Area, Severe Winter Range, and Resident Population Area

CDOW WRIS maps delineate a polygon of elk winter concentration area (a winter range subset defined in Appendix 8.1) extending diagonally across the upper one-half of BMR (Fig. 1). In recent years, animal use patterns suggest that most elk leave the property for the winter before or shortly after the official start of the designated winter range occupancy period (December 15) occurs. However, during some mild falls and early winters, characterized by little snow accumulation, some elk may remain on the property during December before being "pushed" down valley by accumulating snow depths. As of November 24, 1998, there had been no elk activity on the property because limited snowfall allowed animals to remain on ranges higher in the valley. This fall transitional and winter range use occurs throughout the property, not just above the CDOW's line, because there is little human activity on the property between fall and spring. Sagebrush meadows are principal foraging areas and isolated forest cover provides diurnal bedding areas. Elk winter range use of the property may also have increased in recent years as a result of a larger elk population and declining winter range in this portion of the valley.

CDOW WRIS maps delineate an additional winter range, resident population area, and severe winter range polygon (see Appendix 8.1 for definitions) extending south onto the northeast corner of the property to as low as the 9,200 foot contour (Fig. 1). More accurate, site-specific mapping would extend the lower edge of this delineation to the upper edge of the irrigated hayfield, then north around the knob along the lower edge of continuous treeline.

Proposed golf course development would remove large areas native foraging and cover habitats, that are used by elk during portions of winters, in exchange for fertilized, irrigated, non-native grasses that are also nutritious, attractive, and heavily grazed by elk. Golf development would, therefore, result in a net loss of forage quality and quantity, although not a loss equal to the total area of the golf course. Lost cover values would equal the total area of tree removal associated with the course. Residential development would have a greater impact on elk winter range, as a result of large areas of near complete habitat loss in development areas and the displacement of animals from developed and human activity areas that would extend over most of the property. While some animals will enter the large open space areas on the property and forage at night, habitat loss will likely force animals to forage further down valley, putting additional pressure on both native and non-native habitats (i.e., ranch lands). The search for undeveloped winter ranges could also result in increased highway crossings resulting in increased levels of highway mortality. Habitat losses associated with BMR will also contribute to similar winter range losses that have occurred in this portion of the Blue River

Figure 1. CDOW Wildlife Resource Information System-based map showing some seasonal wildlife ranges in the vicinity of Buffalo Mountain Ranch and Silver Mountain Village. An elk summer concentration area, which may be more appropriately considered elk summer range, overlaps the upper elevations of the property, but is not illustrated. The winter range polygon shown represents and area of elk winter range, winter concentration area, severe winter range, and resident population area. Bald eagle winter range extends along the Blue River. Mule deer summer range covers the entire map, the edge of a black bear human conflict area overlaps lower portions of the property, and a Canada goose production area occurs along the Blue River. None of these habitats are illustrated on this map. See Appendix 8.1 for seasonal range definitions. Map prepared by Redstone Development Service. Map on following page.

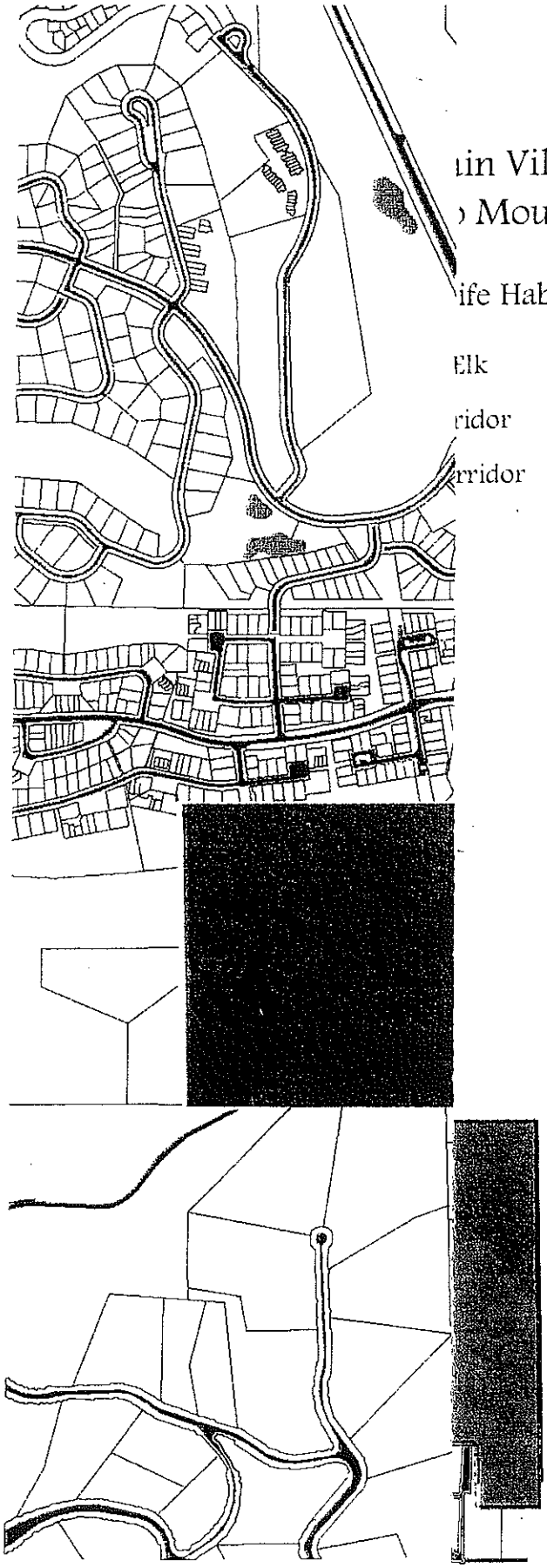

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Figure 1

Valley (e.g., Hamilton Creek Subdivision, Eagle's Nest Phase 1, and Ruby Ranch), as well as additional winter range losses anticipated from similar proposed developments (such as Maryland Creek Ranch and additional Eagle's Nest development). Any Wildlife Mitigation and Enhancement Plan developed for BMR should contain provisions that would avoid, minimize, and compensate for winter range losses associated with BMR development.

4.1.2 MULE DEER

Summer range is the only CDOW-defined mule deer (*Odocoileus hemionus*) habitat present on BMR and in this upper portion of the Blue River Valley. General fall migration patterns are oriented toward down valley winter ranges and these patterns are reversed in spring. The I-70 highway crossing is the same as that used by elk, as described above. Impacts to deer resulting from the proposed development will be similar to those non-winter impacts described for elk above. However, development will be more compatible with continued deer use of the properly because deer will habituate more readily to such developments and they require narrower buffer zones surrounding such developments.

4.1.3 BOREAL TOAD

There are no records of boreal toads (*Bufo boreas boreas*) from the BMR property or from the immediate vicinity of the project area. There are no natural water bodies on or affected by the property that fall within the habitat continuum used by toads for breeding elsewhere. Two man-made ponds occur on the property, but these have not been surveyed for toads. A large boreal toad breeding complex occurs in North Ten Mile Creek and a "new" boreal toad population was discovered in Meadow Creek in 1998 (T. Kroening, CDOW, pers. comm.). Until recently a breeding population also occurred in Straight Creek. The two former populations are now largely isolated from the east side of the Blue River Valley by the Blue River, intervening development, and unsuitable habitat. The Straight Creek population is now isolated from habitats along the lower east side of the Blue River Valley by I-70. However, until the late 1960's, when the first bore of the Eisenhower Tunnel was opened, all these populations were "connected" and the riparian corridor along the Blue River was probably a major local movement corridor. On this basis, it is possible that previously unidentified boreal toad populations may persist is suitable habitats on the east side of the Blue River Valley, south of I-70.

At least an initial boreal toad habitat characterization survey should be conducted of the two, man-made ponds on the property to determine if additional surveys are warranted. The survey would be conducted around mid-May, 1999, before any golf course construction and residential development would begin. If warranted, two follow-up surveys would be conducted in June 1999 following protocol recommended by Goettl and Boreal Toad Recovery Team (1997). A second year of surveys (in the year 2000) could also be recommended by the CDOW, depending upon 1999 survey results. Recommendations related to avoiding impacts to potential boreal toad habitat could be provided to developers allowing some golf course and residential development in the vicinity of the ponds before surveys are completed. Additional boreal toad-related measures and commitments could be developed as part of the Wildlife Mitigation and Enhancement Plan.

4.1.4 WATERFOWL

The Blue River and adjacent waterbodies are delineated as a Canada goose (*Branta canadensis*) production area (see Appendix 8.1 for Canada goose definitions). This production area includes the large post-mine gravel pond on the northwest corner of the property. Low numbers of waterfowl (primarily mallards) also occasionally use the stock pond at the lower end of the irrigated hayfield during summer. The large gravel pond is not only important for goose and duck breeding, but it also supports up to several hundred migratory waterfowl during fall, and probably spring migration. Unlike most gravel ponds in the area, this pond remains open later into the fall (usually into late November to early December), concentrating local waterfowl in this pond. The shallow bay in the northeast corner of the pond is heavily used by dabbling ducks. With the exception of the pond's margins, the remainder of the pond is too deep for dabblers and is a foraging area only for diving ducks.

Golf course development would be the most compatible type of development adjacent to the gravel pond to maintain its waterfowl use. The course will be closed during most of the spring and fall migration periods and the de facto open space will provide adequate buffers from most residential disturbances. Geese will find the open, irrigated and fertilized golf course fairways highly attractive as foraging areas. The Eagle's Nest golf course has increased the number of geese seasonally present in this portion of the valley. The proposed BMR course will provide a similar or greater contribution to local goose numbers. Geese will have a greater impact on the course, than the new course has on the geese. Geese will use the course even with residential development surrounding fairways. Such waterfowl use of golf courses often constitutes a nuisance to golf course management and the CDOW (who is called to resolve the conflict). However, management is presently aware of this situation and measures may be developed in the Wildlife Mitigation and Enhancement Plan that management will implement to reduce conflicts to acceptable levels without having to consult the CDOW.

4.1.5 RAPTORS

Bald Eagle

Bald eagle (*Haliaeetus leucocephalus*) winter range includes Dillon Reservoir and extends down the Blue River (Fig. 1). Bald eagles arrive in the valley in early to mid-November and depart in March. Eagle use of the reservoir usually ends by mid-December with freeze-up. Eagle use of the river continues as long as open water is present for them to fish and hunt waterfowl. Bald eagles are an issue on the property insofar as they forage along the river and the gravel pond. As recommended, golf course development has been sited around the gravel pond in an attempt to maintain continued bald eagle use. The course will be closed throughout the bald eagle's winter residency period. The course would also provide de facto open space and provide adequate buffers from most residential disturbances.

Osprey

A pair of ospreys (*Pandion haliaetus*) is presently nesting on the Eagle's Nest Golf Course and their territory overlaps the reach of the Blue River adjacent to the property and the gravel pond on the property. A pair of ospreys has been nesting within this territory since the late 1970's or early 1980's (J. Craig, CDOW, pers.

comm. Aug. 19, 1998). The gravel pond is presently an important foraging area for this pair. To maintain this functional value, this pond needs to be buffered from human disturbance. As with the waterfowl and bald eagle issues, golf course development has been sited around the gravel pond since it would be largely compatible with continued osprey use. The course would be open throughout most of the osprey's April to September breeding period. However, the resident pair is already habituated to golf activity and an undeveloped buffer zone on the west side of the pond, extending into the Western Skies property, should also facilitate continued osprey use of the pond.

Other Raptors

The brief surveys conducted on BMR to date have not detected any raptor nests. However, prior to finalizing the development plan, systematic surveys of the property should be conducted to locate any raptor nests that may be present. Like other migratory birds, raptor nests and the nest trees are protected by the Migratory Bird Treaty Act and must not be disturbed without authorization from the U.S. Fish and Wildlife Service. It should be recognized, however, that while the viability of any local nest site may be preserved, the local prey base may be so reduced by residential and golf course development on the property that the nesting hawks are forced to relocate to an adjacent area.

4.1.6 BLACK BEAR

A black bear (*Ursus americanus*)/ human conflict area extends from Dillon, through Silverthorne, and down along the east side of Highway 9. This designation, which applies to areas where, for example, bears get into trash cans, tear down bird feeders, etc., could probably be extended to include Willow Brook Subdivision and Phase 1 of Eagle's Nest. As the residential component of BMR develops, this polygon will probably be extended to cover the entire property. These trash disposal/ bear education issues are primarily related to the residential component of the BMR development. Bear/ human conflicts could be avoided and minimized by homeowner education, proper garbage disposal, and provisions governing pets and pet feeding, to be developed in a Wildlife Mitigation and Enhancement Plan.

4.1.7 OTHER CDOW WRIS SPECIES

Other wildlife species identified on CDOW WRIS maps, including bighorn sheep (*Ovis canadensis*), mountain goat (*Oreamnos americanus*), Canada lynx (*Lynx canadensis*), wolverine (*Gulo gulo*), moose (*Alces alces*), river otter (*Lutra canadensis*), mottled sculpin (*Cottus bairdi*), Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), and ptarmigan (*Lagopus leucurus*) either do not occur on the BMR property or the proposed development would have no discernable affect on their use of the property or adjacent areas.

4.1.8 OTHER WILDLIFE SPECIES/ HABITAT

In addition to the development impacts presented above, there will be a general loss of forest cover, sagebrush meadows, and the wildlife values associated with them, including, but not limited to forage, cover, security,

and nesting/ denning sites for the nongame bird and small mammal communities. Reduced forest cover will adversely affect forest interior species and benefit edge and open grassland species. However, virtually, if not, all species now present on the ranch will continue to use the property at full buildout. Species with large home ranges that require large buffer zones around humans (e.g., elk) will become less common on the property. Even tolerant, forest interior species with small home ranges (e.g., red squirrels [*Tamiasciurus hudsonicus*], hermit thrushes [*Catharus guttatus*], and hairy woodpeckers [*Picoides villosus*]) will become less common because of the loss of forest cover. A limited number of generalist edge and grassland interior species (e.g., Canada goose and mountain bluebird [*Sialia currucoides*]) may increase in abundance. "Nuisance species" (e.g., striped skunks [*Mephitus mephitus*], raccoons [*Procyon lotor*], red fox [*Vulpes vulpes*], American crows [*Corvus brachyrhynchos*], etc.) attracted to such human developments may also increase.

The total effect of the residential and golf course development components on BMR will appreciably alter the predevelopment wildlife community. Some of these effects now occur on the property, even though it is largely undeveloped, because of the effects of existing and ongoing development in the surrounding area. These effects extend onto, and affect wildlife use of, the BMR property. However, the considerable down zoning proposed from development densities previously approved on the property should allow most of the existing wildlife use to continue. Transferring density off this more wildlife-sensitive, peripherally located property to SMV, now surrounded by municipal and residential developments, will clearly benefit the local wildlife resource.

4.2 SILVER MOUNTAIN VILLAGE

Wildlife issues associated with the Silver Mountain Village (SMV or Smith Ranch) property are generally less extensive and more benign than those on Buffalo Mountain Ranch (BMR) because SMV would be located on a property containing a limited amount of native wildlife habitats, and a property that is surrounded and influenced by existing developments. Some of the background and recommendations from the BMR discussion above are repeated in this SMV section to provide those readers only referring to SMV with more of a self-contained section.

4.2.1 ELK

Current CDOW WRIS maps do not show any seasonal elk ranges occurring on, or in the immediate vicinity of, Smith Ranch. This is attributable to the property's isolation from undisturbed habitats, proximity to human developments, and to the types of habitats present on the property. Willow Brook Subdivision to the north, a commercial/ residential complex to the south, and Highway 9 and residential development to the east, effectively block any elk access to the property from those directions. Ruby Ranch to the west is more permeable, but the maze of fencing restricts unfettered movements. Tracks observed during the November 24 survey indicated that 2-3 elk had entered, and foraged in, the forested knoll on Smith Ranch through Ruby Ranch. However, even if elk could freely access Smith Ranch, habitats present have limited value to elk. Most of the property is an irrigated hayfield. Such habitats are highly attractive to elk during spring green-up, but difficult access limits this use. At other times of the year, elk are either at higher elevations in the valley (summer and fall), or virtually all foraging values associated with these meadows have been removed by haying

(fall and winter). Native habitats on the ranch are small and isolated, with the exception of the Willow Creek riparian corridor, which overlaps the northern edge of the property. Finally, cover values on the ranch are limited to the small, forested knoll, otherwise surrounded by human developments and relatively broad open habitat. This requires elk to exploit the limited value habitats on the property only at night and to return to forests to the west by early morning.

Proposed development on Smith Ranch will have no appreciable affect on local elk habitats. The closest calving habitat, which starts on Ruby Ranch > 0.5 miles to the west (as low as the 9,400 ft. contour) will be unaffected by Smith Ranch development because Ruby Ranch will provide an effective buffer zone. A summer concentration area, which occurs further to the west than calving habitat, will be similarly unaffected. No migration corridors cross Smith Ranch that would be affected by proposed development. What limited elk transitional and winter range use of the property that now occurs will be lost. Implementation of a Wildlife Mitigation and Enhancement Plan (e.g., dog control measures, fencing, etc.) would benefit any elk use that persists in the area, with greatest value to continued elk use of Ruby Ranch.

4.2.2 MULE DEER

Summer range is the only CDOW-defined mule deer habitat present on Smith Ranch and in this upper portion of the Blue River Valley. Limited summer and spring and fall transitional range use persists on the property. General fall migration patterns are oriented toward down valley winter ranges and these patterns are reversed in spring. Impacts to deer resulting from the proposed development will be similar to those non-winter impacts described above for elk. Deer will likely be excluded from all of the development outside of the single family lots on the forested knoll and the Willow Creek riparian corridor. As described above for elk, implementation of a Wildlife Mitigation and Enhancement Plan would benefit local deer use that persists in the area.

4.2.3 BOREAL TOAD

Boreal toad populations in the vicinity of Smith Ranch and potential toad use of the valley are discussed in section 4.1.3, above. A series of beaver (*Castor canadensis*) ponds occurs in the unnamed creek on the south side of Ruby Ranch Road. These ponds fall within the habitat continuum used by toads for breeding elsewhere. I have not surveyed these ponds for toads and it is unknown if they have been surveyed by the CDOW. The property line is unclear in this area and it is unknown if portions of the lower ponds occur on Smith Ranch. However, no development south of the road in this area is under consideration and it is unlikely that any proposed development on Smith Ranch could affect these ponds. Nevertheless, if toads are present in the ponds, terrestrial toad use outside the breeding season could extend beyond the ponds into potential impact areas. These ponds will be surveyed for boreal toads. The initial survey would be conducted around mid-May, 1999, before any development would begin. If warranted, two follow-up surveys would be conducted in June 1999 following protocol recommended by Goettl and Boreal Toad Recovery Team (1997). A second year of surveys (in the year 2000) could also be recommended by the CDOW, depending upon 1999 survey results. No potential boreal toad breeding habitat occurs within the portion of Willow Creek on Smith Ranch.

4.2.4 WATERFOWL

No habitats on Smith Ranch known to be important to waterfowl would be impacted by the proposal. However, because of the time of year that the single field survey was conducted, it is unknown if Canada geese use the hayfields for foraging, or if low numbers of mallards may nest in the hayfield.

4.2.5 RAPTORS

The raptor issue on the SMV property is limited to the inevitable loss of hunting habitat for several species that now hunt the property as part of a larger territory. No raptor nests were located on or adjacent to the property during the November 24 survey. Results of this survey should be verified by a survey conducted early in the 1999 breeding season. Smith Ranch contains the Public Service Company building on which a pair of ospreys nested in the late 1970's to early 1980's (J. Craig, CDOW, pers. comm. Aug. 19, 1998). However, the territory of the ospreys now nesting on the Eagle's Nest Golf Course includes this former nest site, precluding its use. Superior nest sites to the Public Service building will remain in this nest territory for at least the next 20 years (Thompson 1998). Wintering bald eagles, whose range overlaps the property, have no particular affinity to the habitats on Smith Ranch (Fig. 1).

4.2.6 BLACK BEAR

A black bear/ human conflict area extends from Dillon, through Silverthorne, and down along the east side of Highway 9. This designation, which applies to areas where, for example, bears get into trash cans, tear down bird feeders, etc., extends across Smith Ranch and should probably be extended to include Willow Brook Subdivision and Phase 1 of Eagle's Nest. As the residential component of SMV develops, this polygon will probably be extended to cover the entire property. These trash disposal/ bear education issues are primarily related to the residential (vs. commercial) component of the SMV development. Bear/ human conflicts could be avoided and minimized by homeowner education, proper garbage disposal, and provisions governing pets and pet feeding, to be developed in a Wildlife Mitigation and Enhancement Plan.

4.2.7 OTHER CDOW WRIS SPECIES

Other wildlife species identified on CDOW WRIS maps, including bighorn sheep, mountain goat, Canada lynx, wolverine, moose, river otter, mottled sculpin, Colorado River cutthroat trout, and ptarmigan either do not occur on the SMV property or the proposed development would have no discernable affect on their use of the property or adjacent areas.

4.2.8 OTHER WILDLIFE SPECIES/ HABITATS

Wetlands on Smith Ranch support the greatest wildlife diversity of any habitat present on or adjacent to the property. The broad riparian corridor associated with Willow Creek, only a small portion of which occurs on Smith Ranch, provides a relatively large habitat block containing a habitat core little disturbed by adjacent

developments. Species using this habitat include virtually every species present in this local area of the valley, including trout, small mammals, and songbirds, up to deer, elk, and bear. This habitat island also provides a refugia, for species with smaller home ranges, and a key habitat component for some of the wider ranging species. Without this habitat, many of the wildlife species seen by residents of Willow Brook Subdivision, and future residents of Silver Mountain Village, would not be present. Maintaining the functional value of this wetland will not only require establishing setbacks and avoiding water quality degradation, but also keeping planned and volunteer trails out of the riparian corridor and implementing other measures that would be developed in a Wildlife Mitigation and Enhancement Plan. These same concepts should also be applied to the riparian corridor associated with the unnamed creek along the southwest edge of the property, the wetland complex on the southeast side of the knoll, and even to the small, isolated, woody wetlands, whose vertical structure provides nesting habitat now limited in the area.

Wildlife values associated with Smith Ranch will change considerably as the property is transformed from an undeveloped, largely agricultural land use to a suburban core area, similar to existing developments contiguous to the north, south, and east. Species with large home ranges and that require large buffer zones from humans (e.g., elk) will become less common or discontinue their use of the property. Even tolerant, forest interior species with small home ranges (e.g., red squirrels , hermit thrushes, and hairy woodpeckers) will become less common because of the loss of forest cover. "Nuisance" species (e.g., striped skunks, raccoons, red fox, American crows, etc.) and less desirable species (e.g., starlings [*Sturnus vulgaris*], house sparrows [*Passer domesticus*]) attracted to such human developments may also increase. The most valuable wildlife habitats, supporting the highest diversity values, have either been avoided (wetlands) or development density has been reduced in those areas (i.e., single family homes located in the forest). This approach will help retain most of the wildlife diversity that now occurs on the property.

The total effect of the development will appreciably alter the predevelopment wildlife community. Some of these effects now occur on the property, even though it is largely undeveloped, because of the effects of existing and ongoing development in the surrounding area. These effects now extend onto, and affect wildlife use of, Smith Ranch. However, while proposed development, concentrated in the lower value habitat (i.e., the hayfield) on the property, would eliminate the relatively low wildlife values associated with this habitat, the overall effect of the BMR/ SMV proposal should benefit wildlife because development density and type (commercial) is being transferred from a more wildlife-sensitive, peripherally located property (BMR) to SMV, which is of lower value to the wildlife community and which is now surrounded by municipal and residential developments. The net effect of this proposal should benefit the local wildlife resource. From a broader land use perspective, it is better for wildlife if development is sensitively located in impacted areas, within existing zones of influence, and close to existing communities and infrastructure, rather than locating less clustered developments further away from towns, in more isolated, undeveloped settings.

5.0 RECOMMENDATIONS

Many potential wildlife conflicts associated with development and habitation of Buffalo Mountain Ranch and Silver Mountain Village could be avoided, minimized, and/or mitigated via the implementation of a Wildlife Mitigation and Enhancement Plan developed through consultation with the CDOW. Such a plan would not only identify responsibilities of the developers and any homeowners association(s) that may form, but it would

also educate homeowners about wildlife-oriented considerations incorporated into the development's design and covenants residents are required to implement to minimize wildlife conflicts. Resident education and the implementation of recommended measures will be more important on BMR because of presently high wildlife values that have a good chance of being at least partly retained. However, these issues are of value to both developments. In addition to provisions related to issues addressed in this document, the Mitigation Plan would also include measures associated with, but not limited to, dogs, pet control/ enforcement, bears and garbage, nuisance wildlife, fencing, landscaping, livestock, road-killed wildlife, water depletion/ water quality, Best Management Practices, setbacks from National Forest, limiting public access to National Forest, seasonal closures of public lands to residents, and educating residents about not feeding wildlife and a host of other issues. Such a plan, developed through consultation with the Colorado Division of Wildlife, could be submitted to the Town in the Preliminary Plan stage of each project.

6.0 EXECUTIVE SUMMARY

6.1 BUFFALO MOUNTAIN RANCH

Although Buffalo Mountain Ranch is contiguous with the Town of Silverthorne and bounded on three sides by existing residential developments, the property supports a moderate to high diversity and abundance of wildlife. This is primarily because of the property's large size, valuable foraging and cover habitats at a relatively low elevation in the valley, and because the agricultural operation has avoided large scale habitat modifications and is largely compatible with wildlife use. Native aspen, conifer, sagebrush, wetlands, and aquatic habitats on the property not only support productive wildlife communities, but the interspersion of these habitats provides additional wildlife value, as animals move between cover, foraging, and resting areas.

Elk may use the property year-round, but are most common during fall through spring. Mule deer use the area principally as spring through fall range, and winter further down valley. Black bears, mountain lions, and bald eagles also occasionally use portions of the property over the course of a year. A local nesting pair of ospreys use a post-mining gravel pond on the property as a key foraging area. This pond supports a productive fishery and relatively high numbers of migratory waterfowl. A wide variety of other resident and migratory wildlife species also utilize the ranch.

The conceptual development plan has attempted to avoid the most critical and productive habitats on the property, in part by clustering development, locating development within non-native, versus native habitats, avoiding sagebrush meadows, wetlands, and forest, proposing an innovating golf course design which minimizes the loss of native habitat, and buffering wildlife use on the gravel pond. Secondly, and of considerable value, residential and commercial density would be transferred from this more wildlife-sensitive, peripherally located property to Silver Mountain Village, which is of lower value to the wildlife community and which is now surrounded by municipal and residential developments. The net effect of this proposal should benefit the local wildlife resource.

Development will still have a profound effect on the local Buffalo Mountain Ranch wildlife community, primarily resulting from a general loss of forest cover, sagebrush meadows, and the wildlife values associated with them, including, but not limited to forage, cover, security, and nesting/ denning sites for big game and

the nongame bird and small mammal communities. However, virtually, if not, all species now present on the property will continue to use the ranch at full buildout. Species with large home ranges that require large buffer zones around humans (e.g., elk) will become less common on the property. Even tolerant, forest interior species with small home ranges (e.g., red squirrels, hermit thrushes, and hairy woodpeckers will become less common because of the loss of forest cover. A limited number of generalist edge and grassland interior species (e.g., Canada goose and mountain bluebird may increase in abundance. "Nuisance species" (e.g., striped skunks, raccoons, red fox, American crows, etc.) attracted to such human developments may also increase.

However, many potential wildlife conflicts associated with development and habitation of Buffalo Mountain Ranch can be avoided, minimized, and/or mitigated via the implementation of a Wildlife Mitigation and Enhancement Plan developed through consultation with the Colorado Division of Wildlife. Such a plan would not only identify responsibilities of the developers and any homeowners association(s) that may form, but it would also educate homeowners about wildlife-oriented considerations incorporated into the development's design and covenants residents are required to implement to minimize wildlife conflicts. Resident education and the implementation of recommended measures will be more important on Buffalo Mountain Ranch because of presently high wildlife values that have a good chance of being at least partly retained. In addition to provisions related to issues addressed in this document, the Mitigation Plan would also include measures associated with, but not limited to, dogs, pet control/ enforcement, bears and garbage, nuisance wildlife, fencing, landscaping, livestock, road-killed wildlife, water depletion/ water quality, Best Management Practices, setbacks from National Forest, limiting public access to National Forest, seasonal closures of public lands to residents, and educating residents about not feeding wildlife, and a host of other issues. Such a plan, developed through consultation with the Colorado Division of Wildlife, could be submitted to the Town in the Preliminary Plan stage of the project.

6.2 SILVER MOUNTAIN VILLAGE

Wildlife issues associated with the Silver Mountain Village (Smith Ranch) property are generally less extensive and more benign than those on Buffalo Mountain Ranch because development would be located on a property containing a limited amount of native wildlife habitats, and a property that is surrounded and influenced by existing developments. Most of the property is an irrigated hayfield. However, the property also supports part of the Willow Creek riparian corridor on the north, a riparian corridor with adjacent beaver ponds on the south, and a forested knoll supporting an aspen/ mixed conifer community.

Wildlife values associated with Smith Ranch will change considerably as the property is transformed from an undeveloped, largely agricultural land use to a suburban/ commercial core area, similar to developments contiguous to the north, south, and east. Virtually all of this development will avoid the higher quality wildlife habitats identified above. The zone of influence of these developments extending into these wildlife habitats will degrade and displace some wildlife use. However, with sensitive site planning, design, and resident education, many of the wildlife values now present in these more productive habitats can be retained. While the wildlife values associated with the hayfield and some of the adjacent habitats will be lost, from a broader land use perspective, it is better for wildlife if development is sensitively located in areas that are already impacted by development, within existing zones of influence, and close to existing communities and

infrastructure, such as Smith Ranch, rather than locating less clustered developments further from Town, in more isolated, undeveloped settings.

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8.0 APPENDICES

8.1 CDOW WRIS DEFINITIONS AND SCENARIO DRAFTS OF SELECTED SPECIES

WILDLIFE RESOURCE INFORMATION SYSTEM (WRIS)
ELK
SEASONAL ACTIVITY AREA DEFINITIONS

Overall Range: The area which encompasses all known seasonal activity areas within the observed range of an elk population.

Winter Range: That part of the overall range of a species where 90 percent of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site specific period of winter as defined for each DAU.

Winter Concentration Area: That part of the winter range of a species where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five winters out of ten.

Severe Winter Range: That part of the range of a species where 90 percent of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten. The winter of 1983-84 is a good example of a severe winter.

Highway Crossing: Those areas where elk movements traditionally cross roads or railroads, presenting potential conflicts between elk and motorists/trains. (More than six highway mortalities per mile of highway or railroad per year is a guide that may be used to indicate highway crossings.)

Migration Corridor: A specific mappable site through which large numbers of animals migrate and loss of which would change migration routes.

Migration Pattern: A subjective indication of the general direction of the movements of migratory ungulate herds.

Production Area: That part of the overall range of elk occupied by the females from May 15 to June 15 for calving. (Only known areas are mapped and this does not include all production areas for the DAU).

Resident Population Area: An area used year-round by a population of elk. Individuals could be found in any part of the area at any time of the year; the area cannot be subdivided into seasonal ranges. It is most likely included within the overall range of the larger population.

Summer Range: That part of the range of a species where 90% of the individuals are located between spring green-up and the first heavy snowfall, or during a site specific period of summer as defined for each DAU. Summer range is not necessarily exclusive of winter range; in some areas winter range and summer range may overlap.

Summer Concentration Area: Those areas where elk concentrate from mid-June through mid-August. High quality forage, security, and lack of disturbance are characteristics of these areas to meet the high energy demands of lactation, calf rearing, antler growth, and general preparation for the rigors of fall and winter.

Limited Use Area: An area within the overall range which is occasionally inhabited by elk and/or contains a small scattered population of elk.

Disclaimer: This wildlife distribution map is a product and property of the Colorado Division of Wildlife. Care should be taken in interpreting these data. The information portrayed on these maps should not replace field studies necessary for more localized planning efforts. Written documents may accompany this map and should be referenced. The data was gathered at a scale of 1:50000; discrepancies may become apparent at larger scales. The areas portrayed here are graphic representations of phenomena that are difficult to reduce to two dimensions. Animal distributions are fluid; animal populations and their habitats are dynamic. The accuracy and/or interpretation of these data may be subject to error and shall not be guaranteed. In addition, the State shall not be liable for any cost, loss, or damage resulting from furnishing inaccurate data. These data cannot be sold, transferred, or otherwise exchanged without first obtaining the express written permission of the Colorado Division of Wildlife.

WILDLIFE RESOURCE INFORMATION SYSTEM SCENARIO-DRAFT

ELK

DATA ANALYSIS UNIT E-13

GAME MANAGEMENT UNITS 37,371,AND 28

Data Analysis Unit (DAU) E-13 is located in the southeast portion of northwest Colorado and is commonly referred to as the Williams Fork DAU. E-13 is bounded on the north by the Colorado River, Granby Reservoir, and Arapaho Creek, on the east by the Continental Divide, on the south by the Summit County line, on the west by the Eagle River-Tenmile Creek Divide to Vail Pass, and by the Gore Range Divide to Inspiration Point. DAU E-13 contains 1,358 square miles.

DAU E-13 is part of the Middle Park mountain basin. High and rugged mountainous terrain borders the DAU, including the Continental Divide on the east and south and the Gore Range on the west. The Williams Fork Mountains divide the unit on an east-west line. The Williams Fork watershed lies to the east of the mountains, while the Blue River drainage lies to the west. Many of the peaks along the Continental Divide are over 13,000 feet, the highest being Gray's Peak at 14,270 feet on the southeastern DAU E-13 boundary. Lower elevations are found in the north part of the DAU; the lowest point being on the Colorado River in the extreme northwest corner at approximately 7,300 feet. The rough mountainous terrain influences elk by forcing them to migrate down to the lower elevations of the Blue and Williams Fork River drainages. Three large reservoirs exist in the DAU: Dillon, Green Mountain, and Williams Fork reservoirs. Dillon, Frisco, Breckenridge, Kremmling, and Hot Sulphur Springs are communities in the DAU.

Climate in DAU E-13 is characteristic of Colorado mountainous areas. High elevations receive substantial amounts of precipitation; approximately 38 inches per year at 12,000 feet. Lower elevations receive much less precipitation; only 10 inches per year in Hot Sulphur Springs on the north border of the DAU. Most of the precipitation falls as snow. Summers are relatively short and mild.

Land ownership in the DAU is approximately 70 percent public. Arapaho National Forest controls most of the public lands and includes south and east portions of E-13. The

Bureau of Land Management and State of Colorado control remaining public lands. Private lands are located in lower elevations along the Blue River and in the north portion of DAU E13.

Vegetation types range from alpine zones in the higher elevations to sagebrush shrublands in the lower valleys. Coniferous forests of lodgepole pine and Englemann spruce-subalpine fir occupy most aspects between the sagebrush dominated valley and timberline, with aspen stands interspersed. Predominant vegetative types in the valley include big sagebrush, rabbitbrush, aspen pockets, and willow/cottonwood in riparian areas.

DAU E-13 contains 329 square miles of winter range, 102 square miles of severe winter range, 77 square miles of winter concentration areas, 25 square miles of resident population areas, 54 square miles of known production areas, and 440 square miles of summer concentration areas. Population estimates are made by the CDOW using a computer model called POP-II. Harvest data is available by GMU. Both the POP II model results and harvest data can be obtained at the west regional office of the Colorado Division of Wildlife (CDOW) in Grand Junction.

DAU E-13 has a high bull to cow ratio, approximately 20 bulls:100 cows post hunt. Rugged mountainous terrain reduces hunter accessibility in E-13, resulting in a lower success rate during hunting seasons.

Seasonal elk migrations are elevational. Elk in GMU 37 and the north half of GMU 371 tend to move from the high mountain regions in the south to regions in the north along the Blue River drainage. Some exchange of elk occurs between GMU 37 and GMU 36 (in DAU E-12) near the top of the Trough Road (County Road 1). Elk also move between GMU 37 and GMU 500 across the Continental Divide in the southeast corner of DAU E-13. Most of the elk that summer south of I-70 in GMU 371 winter in the Dowd Junction area of GMU 45 (DAU E-16)..

Large numbers of elk concentrate during summer in open meadow/alpine country in this unit. These summer concentration areas include the Upper Williams Fork, Union Mountain, Copper Mountain, and Jaque Ridge near Copper Mountain Ski Area, as well as the Eagle's Nest and Ptarmigan Wilderness Areas.

Winter range dates for DAU E-13 were defined by CDOW personnel to be from

December 15 to May 15. Elk numbers have increased in the south end of E-13 resulting in an expansion of winter range. Winter concentration areas were defined as being 200 percent or greater than surrounding winter range densities.

There are 102 square miles of habitat designated as critical in DAU E-13. All severe winter range areas are critical habitat. Average winters in the central Rocky Mountain region of Colorado are long and cold. Elk are forced during severe winters into the last available winter habitat area left to them, that of severe winter range. DAU E-13 elk survival would be in jeopardy without these small severe winter range areas.

District Wildlife Managers in DAU E-13 consider free movement between seasonal ranges as being important to elk survival, but because none of these areas are actual migration corridors they can not be designated as being critical habitat.

Summit County and the Fraser Valley is experiencing tremendous growth and development. Proposed developments include water projects, housing developments, and ski area expansions. Increased backcountry recreational activity such as snowmobiling, mountain biking, cross-country skiing, and off road vehicle use may impact habitat usage by elk. Cumulative affects from these projects and activities as well as their associated developments could adversely affect the DAU E-13 elk herd and its management by the CDOW.

VERS: 061396

WILDLIFE RESOURCE INFORMATION SYSTEM (WRIS)
MULE DEER
SEASONAL ACTIVITY AREA DEFINITIONS

Overall Range: The area which encompasses all known seasonal activity areas within the observed range of a mule deer population.

Summer Range: That part of the overall range where 90% of the individuals are located between spring green-up and the first heavy snowfall. Summer range is not necessarily exclusive of winter range; in some areas winter range and summer range may overlap.

Concentration Area: That part of the overall range where higher quality habitat supports significantly higher densities than surrounding areas. These areas are typically occupied year round and are not necessarily associated with a specific season. Includes rough break country, riparian areas, small drainages, and large areas of irrigated cropland.

Winter Range: That part of the overall range where 90 percent of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site specific period of winter as defined for each DAU.

Winter Concentration Area: That part of the winter range where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five winters out of ten.

Severe Winter Range: That part of the overall range where 90% of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten.

Resident Population Area: An area that provides year-round range for a population of mule deer. The resident mule deer use all of the area all year; it cannot be subdivided into seasonal ranges although it may be included within the overall range of the larger population.

Limited Use Area: An area within the overall range of mule deer that is only occasionally inhabited and/or contains only a small population of scattered mule deer.

Migration Pattern: A subjective indication of the general direction of the movements of migratory ungulate herds.

Migration Corridor: A specific mappable site through which large numbers of animals migrate and loss of which would change migration routes.

Highway Crossing: Those areas where mule deer movements traditionally cross roads or railroads, presenting potential conflicts between mule deer and

motorists/trains. (More than six highway mortalities per mile of highway or railroad per year is a guide that may be used to indicate highway crossings.)

Disclaimer:

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WILDLIFE RESOURCE INFORMATION SYSTEM - DRAFT SCENARIO

MULE DEER

DATA ANALYSIS UNIT D-9, (MIDDLE PARK)

GAME MANAGEMENT UNITS 18,181,37,371,28, & 27

Data Analysis Unit (DAU) D-9 is located in the east portion of northwest Colorado and is commonly called the Middle Park DAU. DAU D-9 is bounded on the north and east by the Continental Divide, on the south by the Summit County line, on the west by the Eagle River - Tenmile Creek Divide, the Gore Range Divide, and Canyon Creek. D-9 contains approximately 2,384 square miles. Game Management Units (GMU) 18, 181, 37, 371, 28, and 27 are included in the DAU.

Middle Park is a broad valley or basin surrounded by high rugged mountains having peaks over 14,000 feet. Mountain ranges included in the periphery of the unit are the Rabbit Ears and Never Summer Ranges in the north and the Gore Range along the western boundary. Elevations range from a high of 14,270 feet at Grays Peak on the southeastern boundary of the DAU, to a low on the Colorado River at Kremmling of approximately 7,300 feet. The Summit County portion of DAU D9 (in the south) is somewhat separated from Middle Park by the Williams Fork Mountains. This southern portion is primarily summer range, and is characterized by higher elevations and rugged terrain. Two principal rivers drain the DAU, the Colorado River, which traverses the unit east-west, and the Blue River, which drains the southwest portion of DAU D-9.

Climate in the D-9 is typical of mountainous areas of central Colorado with long cold winters and short mild summers. Most precipitation falls as snow. The average annual precipitation varies from 15 to 17 inches on the valley floor to about 40 inches at 12,000 feet.

Land ownership in DAU D-9 is over 70 percent public. Arapaho National Forest manages the majority of public lands in the north, east, and south portions of the unit, while Routt National Forest manages west portions. Rocky Mountain National Park controls an area of public land located in the northeast corner of D-9. The Bureau of Land Management and the State of Colorado manages remaining public lands. Private lands are primarily located in lower areas of the basin. Kremmling, Hot Sulphur, Winter Park, Dillon, Frisco, and Breckenridge are major communities in the DAU.

Coniferous forests of lodgepole pine and Englemann spruce-subalpine fir occupy

most aspects between the sagebrush dominated valley and the alpine zone above timberline. Predominant vegetative types in the valley include big sagebrush, bitterbrush, rabbitbrush, aspen pockets, and willow bottomlands.

DAU D-9 contains 427 square miles of winter range, 31 square miles of severe winter range, and 104 square miles of winter concentration areas. Population estimates can be obtained from POP II model results. Harvest data is available by GMU. Both the POP II model results and harvest data can be accessed at the west regional office of the Colorado Division of Wildlife (CDOW) in Grand Junction.

Closed basin geography of DAU D-9 influences movements of mule deer by forcing them to winter in Middle Park. Deer move to lower, more snow-free areas in response to snow accumulation at high elevations. Additional snow accumulation results in continued downward migrations of deer onto the Middle Park valley floor.

Extensive studies by the CDOW have identified four specific mule deer wintering areas in Middle Park and have shown strong fidelity of deer to each. These four areas have been identified as the: 1) Muddy Creek subunit in the northwest corner of the DAU, 2) Troublesome Creek subunit in the northeast area of D-9, 3) Williams Fork River subunit in the east-central portion of the DAU, and 4) the Blue River subunit including areas in the south and west-central portion D-9. There is some limited exchange of animals between subunits. Exchange occurs primarily between the Williams Fork and Troublesome subunits, and from the Troublesome to the Muddy Creek subunits. Additional information on mule deer movements in Middle Park can be obtained by referencing the CDOW Special Report Number 46, Distribution and Movements of Mule Deer in Middle Park, Colorado by L.H. Carpenter, et al., July, 1979 from the CDOW office in Grand Junction.

Winter range dates for DAU D-9 were defined by Division of Wildlife personnel to be from December 1 to May 15. Winter concentration areas were defined as being no less than 200 percent greater than surrounding winter range densities. Winters in Middle Park are, on the average, more severe than winters in other northwest region DAU's, emphasizing the importance of adequate winter range for deer survival. Adequate winter range must be available for population stability because deer are forced to remain in the basin during winter. Severe winter range and winter concentration areas are defined as being critical habitat in this unit and total 106 square miles of habitat.

Grand and Summit counties are experiencing tremendous growth, resulting in many developments and proposed developments which may significantly affect mule deer habitat

in D-9. Developments include housing developments, water projects, a new ski area, Silver Creek, and expansion of existing ski areas, as well as associated impacts from all of these. In addition to developments, year-round recreation use is also impacting mule deer.

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WILDLIFE RESOURCE INFORMATION SYSTEM (WRIS)
CANADA GEESE
SEASONAL ACTIVITY AREA DEFINITIONS

Winter Areas: Habitat used by Canada geese from November 1 to time of early spring migrations occurring in mid to late February. Includes winter loafing/resting and feeding areas.

Transitional Wintering Area: Areas used by some Canada geese prior to departure to wintering areas, generally from November 1 to January 1. These areas ice over in late December and January forcing geese to move to traditional ice free wintering areas.

Winter Concentration Area: That portion of a wintering area where geese rest; generally an extensive area of open water such as a large reservoir, that is relatively free from human disturbance.

Feeding Area: Portion of the wintering area where geese move to feed, such as agricultural fields or reservoir shorelines.

Production Area: A unit of water or part of a drainage used by nesting and brooding Canada geese. Includes feeding and loafing areas such as pastures adjacent to rivers or marshes.

Brood Concentration Area: Brood areas, within Production Areas, where geese traditionally congregate in high numbers.

Molting Site: Areas of water used primarily by non-breeding birds, that cannot positively be assigned as originating from specific nesting areas, during molt.

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WILDLIFE RESOURCE INFORMATION SYSTEM SCENARIO-DRAFT

CANADA GOOSE

COLORADO RIVER, COLORADO

The Colorado River basin is located in the central portion of western Colorado. The Colorado River originates at Grand Lake, just west of the Continental Divide and flows through many broad valleys and narrow canyons such as Gore Canyon, Glenwood Canyon, and DeBeque Canyon. The Eagle River joins the Colorado at Dotsero, the Roaring Fork joins at Glenwood Springs, and the Gunnison meets the Colorado at Grand Junction. Tributary rivers of the Colorado which support Canada goose populations and are covered by this scenario include the Eagle, Roaring Fork, Crystal, Fryingpan, Gunnison, and the Blue.

Many changes in the topography of the Colorado River drainage influences the distribution of Canada geese populations. The many steep and relatively narrow canyons that interrupt the leisurely flow of the river thru wide valleys limit the available habitat for geese.

Canada geese are primarily found in wetland areas. Most wetlands in northwest Colorado occur as river bottoms, resulting in goose populations being closely associated with riverine systems. Geese utilize lakes and reservoirs at lower elevations as resting habitat throughout winter. River bottoms along the Colorado River system are primarily privately owned. Agriculture as well as sites for towns and cities are primary uses of private lands found along the rivers.

The Colorado River system contains 349 square miles of wintering areas, 7 square miles of winter concentration areas, 30 square miles of transitional winter areas, 186 square miles of feeding areas, 13 square miles of brood concentration areas, 92 square miles of production areas, and 1 square mile of molting sites. Harvest records and annual census count data are available and can be accessed at the Colorado Division of Wildlife (CDOW) regional office in Grand Junction.

There is a distinction between Canada geese that are produced in northwest Colorado and those that migrate to this area to winter. Winter immigrates from other states arrive on wintering areas in the Grand Valley from mid to late November. Resident geese generally arrive on wintering areas a bit earlier.

Canada geese in this drainage tend to move down river to winter. Important areas for wintering geese include the Colorado River from Silt to Debeque and from Horsethief Canyon to the Utah border, the Gunnison River from Delta to Grand Junction, and Highline Lake, Walker Wildlife Area, and many agricultural fields near Grand Junction, Fruita, Loma, and Mack. Geese found on the Roaring Fork River are utilizing the production areas also during

winter. A few transitional wintering areas have been mapped in Grand and Summit counties. These include Dillon Reservoir, Shadow Mountain Reservoir, Williams Fork Reservoir, and Grand Lake. Birds tend to concentrate in these reservoirs until ice-on occurs, after which time they migrate to lower wintering areas.

In the past, the Colorado Division of Wildlife (CDOW) trapped geese at major brood concentration areas near Silt and Grand Junction and transplanted them throughout western Colorado. Many populations have become well established due to these efforts. Transplants that have occurred within the Colorado River system included the Roaring Fork River, Radium, Shadow Mountain Reservoir, Marble, and areas near Kremmling.

Since 1985, a sizable resident population has developed in the Eagle Valley (Glenwood Canyon to Edwards). The birds primarily use the Eagle River and the side drainages in close proximity to the Eagle River (Lake Creek, Brush Creek, and Gypsum Creek).

Only one molting site has been observed in northwest Colorado and is located at Spring Creek Reservoir near Basalt.

Important brood concentration areas for the west slope goose population occur between Parachute and New Castle on the Colorado River. Lush pastures in close proximity to good wetland habitat and agricultural fields attracts geese with broods to these sites.

Critical habitat on the Colorado River system includes brood concentration and winter concentration areas. The Ranch of the Roaring Fork is particularly important for the Roaring Fork River flock both as winter habitat and a brood rearing area. The most important winter concentration areas are Walker Wildlife Area, Highline Lake, and Horsethief and Ruby Canyons. Availability of these protected winter resting sites has enabled the northwest Colorado Canada goose population to winter in the Grand Valley. Islands and sandbars with low vegetation and good visibility within the mapped production areas are also critical habitat but have not been mapped in the WRIS system. These areas are preferred and selected for by nesting geese. Low vegetation affords nesting birds with high visibility in all directions while islands provide some isolation and protection from predators.

Canada geese populations are increasing in western Colorado. However, the CDOW is concerned with the accelerated loss of available waterfowl breeding habitat due to drainage for agricultural uses and urban expansion.

WILDLIFE RESOURCE INFORMATION SYSTEM (WRIS)
BALD EAGLE
SEASONAL ACTIVITY AREA DEFINITIONS

Active Nest Site:

A specific location in which a pair of bald eagles have at least attempted to nest within the last five years. Any nest location that can be directly tied to courtship, breeding, or brooding behavior is considered active. A buffer zone extends .5 miles around a known active nest.

Inactive Nest Site:

A former active nest location in which neither courtship, breeding, or brooding activity has been observed at any time during the last 5 years. A buffer zone of .5 mile extends around an inactive nest.

Nest of Unknown Status:

A nest that is inactive for at least 10 years and has not been checked.

Roost Site:

Groups of or individual trees that provide diurnal and/or nocturnal perches for less than 15 wintering bald eagles; includes a buffer zone extending 1/4 mile around these sites. These trees are usually the tallest available trees in the wintering area and are primarily located in riparian habitats.

Communal Roost:

Groups of or individual trees used by more than 15 eagles for diurnal and/or nocturnal perches.

Winter Range:

Those areas where bald eagles have been observed between November 15 and April 1.

Winter Concentration Area:

Areas (tree,islands, etc) within an existing winter range where eagles concentrate between November 15 and April 1. These areas may be associated with roost sites.

Summer Foraging Range:

Foraging areas frequented by breeding bald eagles from November 15 to July 30. These areas are almost always associated with nesting pairs.

Winter Foraging Range:

Foraging areas frequented by wintering bald eagles between November 15 and March 15. May be a large area radiating from preferred roosting sites. In western Colorado preferred roosting sites are within dominant riparian zones.

Disclaimer

may be subject to error and shall not be guaranteed. In addition, the State shall not be liable for any cost, loss, or damage resulting from furnishing inaccurate data. These data cannot be sold, transferred, or otherwise exchanged without first obtaining the express written permission of the Colorado Division of Wildlife.

MANAGEMENT RECOMMENDATIONS:

Active Nest Site:

Nests are usually located in dominant trees associated with riparian habitats. These trees usually have moderate to low crown cover and are fairly open to allow various approaches to the nest and good visibility. This 1/2 mile closure is more extensive than the Northern States Bald Eagle Recovery Plan due to habitat used by Colorado's nesting bald eagles. Aside from two Colorado sites in coniferous forests, all others are in cottonwood riparian zones that lack the high vegetational density and nest obscurity offered by habitats in the lake states. No human encroachment should occur from November 15 through July 31 within the .5 mile radius. Year round closure to surface occupancy*, beyond that which historically occurred in the area, should be in effect within 1/4 mile radius of the nest.

***Surface occupancy means non-human habitation, examples would be oil and gas wells, roads, tracks, etc.**

Roost Site:

Open canopy trees are used for diurnal and warm night perches (when dawn and/or dusk temperatures exceed 20 degrees F.) and closed canopy or protected trees are used primarily for cold weather roosts (when dawn and/or dusk temperatures are below 10 to 20 degrees F.). Activity should be eliminated within 1/4 miles radius of winter roosts between November 15 and March 15. If periodic visits are required within the buffer zone after development, activity should be restricted to the hours of 1000 and 1400 from November 15 to March 15. Limited restrictions may be necessary out to 1/2 mile if there is a direct line of vision from the roost to the activities.

Communal Roost:

Buffer Zone and activity restrictions the same as for Roost Site

Winter Concentration Area:

Human disturbance should be avoided from November 15 and April 1.

APPENDIX D
BALD EAGLE WRIS MAPPING SCENARIO
NORTH PORTION OF WEST REGION
COLORADO DIVISION OF WILDLIFE

The north portion of the Colorado Division of Wildlife's (CDOW) West Region includes physical regions known as the Southern Rocky Mountain, Colorado Plateau and Wyoming Basin provinces. Mountains in the Southern Rocky Mountain province are the Park and Gore Ranges with elevations ranging above 12,000 feet (4000 m). Both the Colorado Plateau and Wyoming Basin are dominated by thick sequences of sedimentary rock (Weaver 1978) resulting in formations such as the Bookcliffs, Danforth Hills, Williams Fork Mountains and 20-mile Formation.

The result of this diversity of physiography is significant populations of birds of prey. CDOW has monitored bald eagle habitat affinity and reproductive success in the Northwest Region for a number of years in varying degrees of intensity.

In 1982 a literature review was conducted to identify limiting factors on bald eagles and to make recommendations of mappable biological features or seasonal activity areas to be included in the Wildlife Resource Information System (WRIS).

Bald eagles in Colorado are highly dependent on adequate prey concentrations and open canopied riparian trees relatively free of human disturbance. Most nesting and winter habitats are typically located at sites which provide protection from disturbance, lending support to the theory that eagles seek relative seclusion for nesting. However, one pair of bald eagles have successfully nested in a tall cottonwood tree located within the Craig golf course.

Annually, the Colorado Division of Wildlife monitors and conducts inventories of nesting bald eagles and conducts winter censuses along the Colorado, White, and Yampa Rivers.

In northwest Colorado bald eagles have successfully nested on the White, Yampa, Colorado and Little Snake Rivers. Many active nests have been observed on the Colorado River, but few have been successful. The reader is referred for summary information to bald eagle nesting and winter census reports prepared by Gerald Craig, CDOW Ft. Collins.

Nest site inventories includes data on both active and successful nest sites. At successful nest sites information is maintained on the number of fledged eaglets and leg banding of the young has occurred at some sites in some years.

Other than nesting pairs, few bald eagles are found in Colorado during the summer. Immature eagles, other than those produced in nests, are seldom observed in Colorado during the summer months. Nesting bald eagles diets are composed of a variety of prey items. No thorough studies have documented summer diets in Colorado, but they are likely composed of fish, rabbits, birds, and rodents (prairie dogs).

Nesting populations have increased very slowly in the last 20 years. Known nest sites have continued to remain active with slight changes in nesting locations. New nesting sites have been added over the years, but at a very slow rate.

Mid-winter population trend censuses are conducted by fixed-wing aircraft along fixed census routes. Time of day and techniques are consistent each year so that year-to-year comparisons can be made with the data. The mid-winter counts are normally conducted during the second week of January each year. These censuses are considered to be roost site counts, however eagles observed flying and not yet on roost sites are included in the census. The Yampa River in censused in the morning starting at sunrise. The White and Colorado Rivers are censused late in the day and are usually completed at dark. The time frame of these counts have been established by tradition and are maintained for sake of consistency. These counts are considered trend counts and are not conducted to census every bald eagle in the

State. Bald eagles are found outside the established census routes.

Tully (1983) suggests that higher counts could be obtained of winter bald populations by conducting morning censuses rather than evening censusing. Observations made during annual winter censuses tend to substantiate Tully's theories. We often observe bald eagles returning to night roost sites during the census flight; sometimes well after sundown. In contrast eagles are rarely observed leaving night roost sites during morning counts.

Bald eagles observed during these aerial censuses are counted and recorded as either adult or immature birds. Locations are recorded on maps. Observations are also recorded so that roost sites can be distinguished from communal roost sites.

Bald eagles almost always select cottonwood trees as night roost sites in northwest Colorado. The trees selected for roosts should not be necessarily be considered a preference for cottonwoods, but that this species is almost the only choice available in winter habitats of the bald eagle. Bald eagles have been observed roosting in conifers (most likely spruce or fir trees) east of Meeker along the White River. They have also been observed roosting in large Juniper trees along the Colorado River in the vicinity of Parachute. But for the most part Cottonwood tree dominate the riparian habitats along the rivers and are largest (tallest) trees in these sites. Bald eagles will use roost sites which lie outside the riparian zone. One such site is found near Mack, Colorado. However, eagles at this site roost in large cottonwood trees which are of similar size to those found in adjacent river bottoms.

Bald eagles are often found using communal roost sites. At these roost the eagles gather at dark and it is not unusual to observed 10 or more birds roosting in a single tree. At some sites 25 or more birds have been observed using a roost site complex.

During the day bald eagles spend most of their time searching for prey. While some daytime roosting occurs, the birds spend most of their time either actively searching for food or are found feeding on prey. Some roosting occurs, often in the vicinity of feeding sites.

Winter food habits of bald eagles in western Colorado are considered to be very opportunistic, taking what ever food sources is available at the least energy cost to the birds. Rather than preying on live animals the eagles's primary winter food source is carrion. Polonsy reported on an analysis of 230 bald eagle castings and found that mammals comprise 88% of the total winter food diet. Elk and mule deer carrion accounted for 76% of the diet, with rabbits and hairs, rodents, and unknown mammals composing 4% each. Avian remains were predominantly from Canada goose and mallard. One rodent was found and scales remains of fish, most likely carp, were also found. Often rivers are almost completely iced over during the winter, which severely limits the birds ability to fish. It also forces waterfowl to migrate to more suitable habitats, which dramatically reduces them as a possible prey source.

Bald eagles are frequently found foraging outside the river corridors in which they roost. Dead mule deer, elk, and antelope are often found dispersed over their winter range. Eagles will range many miles in efforts to find carrion. CDOW personnel have often observed bald eagles both actively feeding and searching for food during big game winter classification counts and censuses.

Winter ranges for bald eagles can be very large and can be somewhat dependant on the distribution of wild ungulates. The range might be expected to be larger during mild winters and smaller during harsh winter due to the concentration of ungulates at lower elevations along major drainages.

Maintenance of mature cottonwoods along major riparian zones is considered essential for bald eagles in Colorado. A lack of cottonwood regeneration has been a concern for the CDOW for some time. Spring flooding of riparian zones, which stimulates cottonwood regeneration, has been reduced greatly in Colorado as dams have been constructed. Little regeneration of cottonwood is occurring. Mature trees dominate riparian habitats throughout

western Colorado.

Currently CDOW mapping shows bald eagle roosting areas and nest sites with a 500 meter buffer. It should be stressed that CDOW maps are not to be considered definitive; other nests or winter roosts may, and probably do exit, for which CDOW has no records. It must also be understood that no attempt has been made to depict or identify other limiting factors such as prey availability which have been mentioned as possible limiting factors.

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APPENDIX A
WRIS
BLACK BEAR SEASONAL ACTIVITY AREAS
January, 1997

Overall Range	The area which encompasses all known seasonal activity areas within the observed range of a population of black bear.
Summer Concentration Area	That portion of the overall range of the species where activity is greater than the surrounding overall range during that period from June 15 to August 15.
Fall Concentration Area	That portion of the overall range occupied from August 15 until September 30 for the purpose of ingesting large quantities of mast and berries to establish fat reserves for the winter hibernation period.
Human/Bear Conflict Area	That portion of the overall range where two or more confirmed black bear complaints per season were received which resulted in CDOW investigation, damage to persons or property (cabins, tents, vehicles, etc), and/or the removal of the problem bear(s). This **does not** include damage caused by bears to livestock or apiaries.
Movement Pattern	A subjective indication of the general direction of black bear movement between seasonal use areas.
Movement Corridor	A specific mappable site through which bears habitually move between areas of seasonal use and loss of which would change these seasonal use patterns or force bears into nearby areas where conflict opportunities are greater.

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