

**THE COLUMBIA WETLANDS WILDLIFE MANAGEMENT AREA:
OPERATIONAL MANAGEMENT PLAN - 1998-2002.**



**Ministry of Environment, Lands and Parks
Fish, Wildlife and Habitat Program
Cranbrook, B.C.**

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EXECUTIVE SUMMARY

The Columbia Wetlands is one of the largest contiguous systems of wetland habitats in North America. It is situated between Fairmont Hot Springs and Donald in the Rocky Mountain Trench in south-eastern British Columbia. The wetlands stretch for a distance of 180 kilometres and encompass over 20,000 hectares. In 1996 a Wildlife Management Area was established in the wetlands to secure the land base, but allows other activities to take place, subject to the needs of wildlife. This plan provides:

- An overview of the resources of the area.
- A vision, goals and guiding principles for the WMA.
- A list of potential enhancement options.
- Strategies for managing human activities.

Discussions with a variety of interest groups were carried out as the plan was being developed and three public meetings were held, in Invermere, Brisco and Golden. The plan was developed based in large part on that input.

The Columbia Wetlands are a vital component of the Pacific Flyway, provide feeding and resting sites which are used intensively by waterfowl during spring and fall migrations. Canada geese nest in the wetlands as do a variety of dabbling and diving ducks. The deciduous and mixed forest communities that occur near the wetlands are of special importance to cavity nesting ducks and great blue herons. The river and larger water bodies support abundant populations of coarse fish that provide food for mergansers, loons, grebes, osprey, herons, kingfishers and bald eagles. Marsh vegetation, such as cattails and other emergents, provides over-water nesting and feeding habitat for some duck species, marsh wrens and blackbirds. The deciduous forest communities in the WMA provide important habitat for songbirds and cavity nesters. White-tailed deer, elk, and moose make extensive use of the Columbia Wetlands in winter. Beaver and muskrat are common throughout the Columbia Wetlands, and the area is of importance to local mink and otter populations. It is also an important area for several species of amphibians and reptiles.

Two species, the Northern Leopard Frog and the White Sturgeon (Columbia River population) are listed as “critically imperiled” for this area. There is little evidence that either species presently occurs in the wetlands.

The Columbia Wetlands offer opportunities for a range of recreational activities including wildlife viewing, hunting, fishing and trapping. The wetlands and the channels of the Columbia River are used by canoeists and other boaters. In recent years there has been some use of the river channel by jet boats and more recently, by jet-skis. The wetlands are also used in the winter by cross-country skiers and snowmobilers, primarily adjacent to the communities along the wetlands.

Four big game guiding operations in the upper Columbia occupy territories in the mountains on either side of the Columbia Wetlands and there are several traplines in the wetlands. Two wildlife viewing operations run interpretative float trips in the Golden area. A variety of other operations have started up in recent years or are planned for the future.

The Columbia River system has a long history of occupation by indigenous peoples. Camps and settlements of the K'tunaxa people, as well as dozens of underground pit houses of the Shuswap people are located between Canal Flats and Golden. Prior to the development of hydro-electric projects downstream, the Upper Columbia was a major salmon spawning area. Salmon were an important staple for the K'tunaxa and Shuswap peoples.

Flooding, high water tables and climate limit land capability for agriculture within the Columbia Wetlands. There are two Crown range permits in the wetlands. Commercial forest occurs only on the few sites. Mineral values may occur at depth under the wetlands but would be difficult to access due to the deep overburden of silts and gravel that lie beneath the marshes.

A vision and goals for the WMA were developed to reflect the views of the public concerning this area and to provide direction for the management of the WMA.

VISION

- **The Columbia River Wetlands will continue to function as a flood-plain ecosystem with a complex biological community governed by natural fluvial and ecological processes.**

GOALS

- **To maintain self-sustaining populations of indigenous fish, wildlife and plant species in the Columbia Wetlands WMA.**

- **To maintain wildlife populations at the long term sustainable carrying capacity of the natural habitats in the WMA.**
- **To manage wildlife populations and plant communities to ensure balance and the continuance of all indigenous species.**
- **To enhance habitats where there will be no or minimal impact on the natural evolution of the landscape and where enhancement replicates or replaces natural processes.**
- **To maintain a sense of wildness and solitude in the WMA.**
- **To maintain the aesthetic quality of the wetlands.**
- **To provide opportunities for the public to appreciate, study, and view wildlife in their natural habitats.**
- **To provide opportunities for first nations people to carry on their traditional uses of the area.**
- **To permit opportunities for commercial tourism operations that provide opportunities for the public to appreciate, study, and view wildlife in their natural habitats.**
- **To manage and regulate extractive resource uses that are compatible with the purpose and consistent with the goals of the WMA.**
- **To provide opportunities for scientific study that will contribute to an understanding of the ecological function and dynamics of the wetlands.**
- **To provide opportunities for the education of the public about the ecological processes at work in the wetlands and the goals and programs of the WMA.**

Based on these goals, “guiding principles” were developed to provide an interpretation of how the vision and goals of the WMA will be achieved in day to day management decisions in the WMA.

- **Principle 1: All activity that occurs in the WMA must have a neutral or positive effect on wildlife, fish and plant communities.** Many of the people we talked to saw this principle as a "litmus test" for deciding what kinds of activities should occur in the wetlands.

- **Principle 2: Natural fluvial, climatic and ecological processes (flood, fire, natural changes in the river channel), will remain the primary determinant of the condition of the wetlands and other habitats.**
- **Principle 3: Only wildlife habitat enhancement projects that do not compromise natural processes in the wetlands and have minimal visual impact, will be considered.**
- **Principle 4: Management effort will be directed at the entire range of species present, with special consideration given only in the case of endangered species.**
- **Principle 5: Endangered or threatened species for which appropriate habitats exist in the WMA, will receive particular attention in the management of the area.**
- **Principle 6: Those uses that encourage the enjoyment of wildlife and natural landscapes will be given priority over other uses.**
- **Principle 7: Traditional uses, as described in the "East Kootenay Table Columbia River Marshlands Agreement" will continue in the WMA.**
- **Principle 8: Traditional use by first nations will continue in the WMA.**
- **Principle 9: A high quality recreational experience will be maintained for those using the wetlands.**

Based on these goals and guiding principles, the following management actions will be considered in the wetlands.

Habitat Management

No extensive habitat management will occur, except under specific circumstances. The priority for the next five years will be the acquisition of baseline data and monitoring of vegetation, water quality and in some cases, wildlife numbers and population health. Among the projects that may be considered are:

Establishing baseline data on the vegetation of the wetlands. Monitoring sites should be developed to document changes in the vegetation found in the WMA.

Monitoring water quality. Human activity adjacent to the wetlands could affect water quality and thus fish and wildlife population levels in the wetlands.

Documenting the ecological and human history of the wetlands. A better understanding of the factors that have defined land forms, vegetation and wildlife numbers in the past will assist in managing the WMA in the future.

Baseline surveys of fish populations. The Columbia River supports significant populations of non sportfish that in turn support a wide variety of wildlife species. Potential habitat changes that could affect these fish populations are difficult to predict without some baseline life history data on all of the fish populations in the system.

Status of cottonwoods stands. Several people have observed what appears to be a decline in vitality of cottonwood stands along the levees in the wetlands. Further work is required to identify the agents causing early decay characteristics in younger and mature trees and determine if there are significant differences between long term mortality and recruitment rates in cottonwood stands.

Songbird surveys. Riparian areas are very important as nesting areas for songbirds. Nesting surveys should be carried out to provide baseline data on their use of riparian habitats in the WMA.

Installation of nest boxes for cavity nesting birds. A variety of birds use cavities for nesting in this habitat type. However, before a major program is initiated, a survey should be carried out to see if a nest box program can be justified. If there are sufficient natural cavities, then such a program may not be productive.

An assessment of habitat management options on alluvial fan sites. An assessment of enhancement and protection options should be developed for areas at the outflow of Horsethief Creek, Forester Creek, Bugaboo Creek and Spillimacheen River. These sites support a mix of deciduous and coniferous forest, shrub and meadow areas. These are very important sites for wintering ungulates and are important nesting areas for a variety of bird species.

Browse rejuvenation by slashing or burning. There is some indication that burning in the wetlands makes more browse available, however there are no good data on this issue. Further work is required on the degree to which burning increases the availability and palatability of browse.

Identification of “special habitats” and an inventory of species using such sites. Clay bank sites used by swallows, very old stands of Douglas-fir along the edges of the wetlands and rubble and steep rock habitats that may be important to some reptiles should be inventoried.

Management of cross-valley movement corridors: Portions of the WMA near Radium Hot Springs and Fairmont will be managed to maintain their value as movement corridors and to maintain winter range values for bighorn sheep and other ungulates. Forest ingrowth is a major problem in these areas and active habitat enhancement may occur.

Wildlife Management

The management of wildlife populations in the wetlands is a shared responsibility between the CWS (waterfowl and other migrants) and the provincial Wildlife Program (other wildlife). Waterfowl harvest strategies will be developed co-operatively between the CWS and Wildlife Program. The Canadian Wildlife Service will continue to monitor nesting success and fall migrant numbers. No seasons and harvests specific to the WMA are planned.

The Management of Human Activity in the wetlands

The management of human activity will be based on the vision, goals and principles articulated in this plan. A regulation was put in place in September 1997 that limited access to the wetlands to “motorized conveyances of less than ten horsepower”. This issue was a major concern during the period in which this management plan was being developed. Hunting, fishing, wildlife viewing and boating (using small motors) will remain as important uses in the wetlands with the exception of those places closed under other regulations. Trapping, guide-outfitting and commercial wildlife viewing operations will continue. Grazing by cattle will continue on the permitted areas, subject to range use plans, but will not be considered in other areas. Logging, on appropriate sites, will be considered on a site specific basis. Research on all aspects of the Columbia wetlands system will be supported, especially research which addresses habitat and wildlife management issues relevant to the WMA. Education of the public on the values of wetlands will be an important use of the wetlands. Proposals for educational activities will be considered on a case by case basis. All of these activities will be managed consistent with the vision, goals and guiding principles articulated in this plan.

There are four parcels of land within the wetlands that are managed by the CWS. CWS is presently updating their management plan for these lands such that their plan will be consistent with the management of the WMA.

The CPR railway is the major industrial intrusion in the wetlands. Many concerns were raised during the public meetings concerning the impact of the railway on the wetlands. Contact will be made with CPR to discuss these concerns and develop a long term relationship with the company to deal with these issues.

The Ministry and First Nations communities have common concerns in the wetlands. The Tribal Council will be consulted if major management actions are required that go beyond that laid out in this plan.

The public, stakeholders and government agencies will be consulted if major management actions are required that go beyond that laid out in this plan. The concept of “river keepers” or other means to involve local people in the ongoing management and protection of the wetlands will be explored. The management plan will be reviewed in five years, in 2002.

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* (These appendices are not included with this plan but are available at the MELP office in Cranbrook.)

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REPORT PREPARATION

This plan was developed under contract but was reviewed in detail by staff of the Ministry of Environment, Lands and Parks. It expresses the policy and views of the Ministry.

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1.0 INTRODUCTION

The Columbia Wetlands is one of the largest contiguous systems of wetland habitats in North America. Although agricultural, residential, commercial and forest development occurs along its edges, most of the marshes have remained in their natural condition. In 1994, the Regional Land Use Planning process carried out by the Commission on Resources and Environment (CORE 1994) identified this area as a high priority for special status as a conservation area. Both the Commission Report to government and the subsequent Regional Land Use Plan developed by government, recommended "special management" status for this area. In 1996, the Columbia Wetlands was established as a Wildlife Management Area (WMA). This status secures the land base, but allows other activities to take place, subject to the needs of wildlife.

This plan provides direction for the long term management of the WMA. It consists of:

- An overview of the resources of the area, with reference to more detailed descriptions in other reports.
- A vision, goals and guiding principles for the WMA, potential enhancement options and strategies for managing human activities.
- An appendix describing public input into the development of this document.
- An appendix describing the status of rare and endangered species that use the wetlands.
- An appendix with 1:100,000 scale maps of the WMA .

A folio of 1:20,000 scale maps of the WMA is available at the Ministry of Environment, Lands and Parks (MELP) office in Cranbrook, B.C. Also available at that office are appendices describing:

- The boundary of the WMA.
- A work plan for the first five years of the plan.

This plan will provide direction for the management of the WMA for the period 1998-2002. The plan will be reviewed at that time.

2.0 GENERAL DESCRIPTION OF THE MANAGEMENT AREA

Below is a brief description of the resources of the Columbia Wetlands. More detailed descriptions are included in Pedology Consultants et al. 1983, Hennan 1975, Jamieson and Ohanjanian 1993, Jamieson 1996, Jamieson 1996a and others.

2.1 LOCATION

The Columbia River Wetlands are situated between Canal Flats and Donald in the East Kootenay Trench Ecoregion in south-eastern British Columbia (Figure 1.). They extend for a distance of approximately 180 kilometres and encompass over 20,000 hectares. The majority of these wetlands are included in the Columbia Wetlands WMA which stretches from Fairmont Hot Springs to Donald. The wetlands between Canal Flats and Fairmont have been included in the East side of Columbia Lake WMA.

2.2 LAND STATUS

The WMA includes all provincial Crown lands in the wetlands. There are some federal lands and Nature Trust of B.C. lands that are managed by the Canadian Wildlife Service in the wetlands. These lands and one provincial park are not included in the WMA. The adjacent benchlands to the east are almost entirely private or native lands while to the west the land is primarily Crown with some private land associated with the communities of Invermere, Athalmer, Brisco, Spillimacheen and Nicholson.

2.3 PHYSIOGRAPHY

The wetlands are located in the Rocky Mountain Trench, a long, wide valley between the Rocky Mountains to the east and the Purcell Mountains to the west. The Trench is 3 to 5 km wide with sloping benches on either side of the valley floor. The Columbia River floodplain is very flat and varies from 1-2 km in width.

2.3 HYDROLOGY

The Columbia River has a very low gradient of 19 cm/km (approximately 1 foot per mile) from Columbia Lake to Golden. As a result, the main channel of the Columbia River meanders from side to side and around the alluvial fans at the outflows of the various tributaries. The damming effect of these fans has created Columbia Lake, Windermere Lake and the shallow floodplain areas that form the Columbia Wetlands. Marshes and ponds have formed within the bends of the river, forming an almost continuous wetland (Figure 2.) . The combination of low river gradient, the flat valley floor and seasonal flooding keeps the water table near the ground surface throughout the summer.

Figure 1. The location of the Columbia Wetlands Wildlife Management Area in southeastern B.C.

Figure 2. The marshes and wetlands of the Columbia Wetlands
(air photo 30BCC-916, No. 164), between Parson and McMurdo.

The hydrological cycle and fluvial* processes of the Columbia River are major factors affecting all ecological processes and values in the wetlands. The deposition of silts in this area during the glacial era (Sawicki 1990) helped to shape the valley and wetlands. Silt deposition (6,568 tonnes/km²/yr according to Locking 1983) and the deposition of the majority of these silts upstream of constrictions to the river flow created by cross-valley alluvial fans (Quin 1982) are important factors in the ecology of the wetlands. The flow of the Columbia River at Fairmont Hot Springs at the upstream end of the wetlands, ranges from an average high of 35.6 m³/sec in June to an average low of 3.83 m³/sec in January. At Donald Station, at the downstream end, corresponding averages are much higher (528 m³/sec and 32.4 m³/sec respectively) since the wetlands are fed by over 80 streams draining the mountain ranges on either side of the valley. Severe floods occur on the Columbia River and its major tributaries on an irregular basis (1894, 1916, 1948, 1972 and 1974).

* “Fluvial processes describe the actions of flowing waters that erode river banks, deposit silt and sand and in other ways alter the nature of areas adjacent to waterways.

3.0 RESOURCE VALUES AND LAND USE

3.1 VEGETATION

The vegetation of the wetlands was classified and mapped by Pedology Consultants et al. 1983. A total of 26,208 hectares of wetland, from Canal Flats to Donald, were classified as indicated in Table 1. Bio-terrain mapping is available for a small portion of the wetlands in the Radium Hot Springs area (Ketcheson 1996).

TABLE 1. SUMMARY OF VEGETATION TYPES IN THE COLUMBIA WETLANDS (Pedology Consultants et al. 1983).

VEGETATION TYPE	DEFINITION	HA.	% OF AREA
MARSH	Peat-filled wetlands	9218.7	35.18%
WATER	Standing and flowing water	8207.1	31.32%
DECIDUOUS FOREST	Deciduous dominated forest	3250.2	12.40%
MIXED FOREST	Mixed conifer and deciduous forest	1586.7	6.05%
ANTHROPOGENIC	Land modified by man	1200.3	4.58%
SHRUB THICKET	Shrub dominated areas	1099.4	4.19%
CONIFEROUS FOREST	Conifer dominated forest	1092.8	4.17%
NON-VEGETATED	River bars and un-vegetated areas	404.9	1.54%
MEADOW	Land dominated by grass species	101.8	0.39%
POND	Small water bodies	22.8	0.09%
SWAMP	Wet areas dominated by shrubs/trees	23.1	0.09%

TOTAL	26207.8	100.00%
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These riparian and wetland habitat classes occur within the Interior Douglas-fir (IDF) and the Interior Cedar-Hemlock (ICH) Biogeoclimatic Zones (Braumandl and Curran, 1992.). Vegetation on levees and in some slightly drier areas includes trees such as hybrid white spruce, black cottonwood, and aspen, and shrubs such as willow, alder, rose and red-osier dogwood. On the flood-plain itself, there is a mosaic of emergent species, including hardstem bulrush (or scouring rush), cattail, horsetail and sedges. There is also a variety of submergents and other aquatic plants such as bladderwort, pondweed, yellow water lily and arrowhead in the ponds and marshes.

The WMA also includes bench land areas at Dry Gulch and near Fairmont. These sites support a variety of grassland and forest types typical of the Rocky Mountain Trench. These are described in detail in Ketcheson 1996.

3.1.1 HUMAN IMPACTS ON THE VEGETATION OF THE WETLANDS

The vegetation in the wetlands is the result of fluvial processes (seasonal flooding, silt deposition, levee creation), interacting with climate and soils over the millenia. However, over the last century, human use has also had an important influence. Today there are almost no conifers growing on the levees adjacent to the main channel. However, in 1890 there was sufficient spruce (some cedar) on the levees to support a mill that was established at Golden in 1890 (H. Mitchell, pers. comm.). The trees were cut and floated down the river to the mill. From the late 1800s until 1915 when the railway was built, the Columbia River was the major artery for transport up and down the valley. Sternwheelers, (generally 60 feet long with a 60 foot barge in front) operated from Golden to Invermere, occasionally going as far up as Columbia Lake in the spring. During this period the main river channel was deepened by a government dredge (B. Blakely, pers. comm.) and dams were built across the entrance and exits of the side channels and major wetlands to keep water in the main channel. This action likely altered the water table, annual hydrologic cycle and vegetation in the wetlands. The wetlands were also burned on a regular basis (B. Mitchell and others, pers. comm.) to remove debris so they could be hayed during this period. When the stern-wheeler era ended in 1915 with the building of the railway, the dredging ended and the water control structures slowly decayed. As these structures collapsed and the main channel filled with silt again, the water table in the wetlands probably increased, again altering the vegetation.

In effect what we see today is not an “unaltered natural” system, but a system that has evolved from a system that was heavily altered by human actions early in the century. The status of cottonwood stands and wetland vegetation should be viewed in that context.

3.2 WILDLIFE

3.2.1 Wildlife Habitat Types

There are several important wildlife habitat types in the wetlands. These are:

Flowing Water - The Columbia River and side streams flowing into the river.

Open Water Lakes and Ponds - Lakes and ponds without emergent vegetation.

Marsh - Permanent wetlands with emergent vegetation.

Shrub Thicket - Willow dominated thickets occurring along the edges of many of the wetlands.

Sedge Meadow - Seasonally flooded wetlands, generally a combination of mudflats, dwarf scouring rush stands and sedge dominated wet meadows.

Levee Vegetation - Cottonwood stands with a shrub understory found along the main river channels.

Mixed forests on alluvial fans - A mix of deciduous and coniferous forest found where streams and rivers enter the wetlands.

Riparian Flats from Moberly to Donald - An area dominated by coniferous forests types.

Other wetlands habitats - Bogs, fens and swamp occur in a few areas.

Habitats adjacent to the wetlands - Clay cliffs, grasslands and coniferous forests.

These habitat types are based on the vegetation and land form descriptions above, but are presented in a slightly different form to simplify the discussion of habitat enhancement options.

3.2.2 Wildlife Use

The Columbia Wetlands provide seasonal and year-round habitat for a large number of wildlife species.

Migratory waterfowl: The Columbia Wetlands are a vital component of the Pacific Flyway, a waterfowl migration route which stretches from nesting areas on the Arctic Ocean to wintering grounds in South America. The Columbia Wetlands provide feeding and resting sites which are used intensively by several species of ducks, geese, swans and other migrants during spring and fall migrations. More than 1000 tundra swans use the area in the spring; trumpeter swans also appears regularly in migration. Single day counts have revealed more than 15,000 ducks in autumn (Caspell et al. 1979, Kaiser et al. 1977, 1977a, Kaiser et al. 1978). Canada geese (1200 pairs) breed and nest in the wetlands as do a variety of dabbling and diving ducks. Nesting success is high for geese since most goslings are hatched before the spring flood, however the annual spring flood makes for relatively poor nesting success for most ground nesting duck species.

The deciduous and mixed forest communities that occur near the wetlands are of special importance to cavity nesting ducks and great blue herons. There are several great blue heron rookeries and at least 24 pairs of osprey in the wetlands (Forbes et al. 1985).

Permanent water bodies support abundant populations of coarse fish that provide food for mergansers, loons, grebes, osprey, herons, kingfishers and bald eagles. Marsh vegetation, such as cattails and other emergents, provides over-water nesting and feeding habitat for some duck species, marsh wrens and blackbirds.

Ungulates: White-tailed deer, elk, and moose make extensive use of the Columbia Wetlands in winter. The wetlands were classified as Class 2, 3 and 4 throughout in the Canada Land Inventory, however these areas are associated with benchland areas which are Class 1 ungulate winter range (Canadian Wildlife Service, 1971). The wetlands are especially important for elk; 90% of the elk in the Upper Columbia basin winter in or adjacent to the wetlands. Estimates from recent aerial surveys indicate winter populations of approximately 200 moose, mostly from Parson north, 500 elk, primarily on the alluvial fans of tributary streams south of Parson and in excess of 1,000 White-tailed deer, found mostly south of Spillimacheen (L. Ingham, per. comm.). Mule deer also use the marshes on occasion, but tend to spend most of the winter on the benchlands above the marshes. In the summer, the wetlands support white-tailed deer and moose while the elk herds move up into the high country on either side of the valley.

Large Predators: Cougar, wolf and coyote occur in the wetlands, primarily in the winter when ungulates are using the area. Black bear use the wetlands in summer and fall. There is little use of the wetlands by collared grizzly bear in the Golden to Donald portion of the WMA (B. McClellan, pers. comm.). Tracks of a large grizzly bear were observed on the river near Brisco in Oct. 1997 (T. Munson, pers. comm.). Prior to 1936 when salmon spawned in the Upper Columbia, the wetlands were likely a concentration area for grizzly bear (See Appendix II). during the spawning season.

Fur-bearers: Beaver and muskrat are common throughout the Columbia Wetlands, and the area is of great importance to local mink and otter populations. The push-ups created by muskrats are used by a variety of waterfowl for resting and are important nest platforms for Canada geese, black terns and other species. The marshes have been a major source of fur for local trappers (M. Yadernuk, pers. comm.) for several decades.

Small Mammals: A variety of other small mammals inhabit the marshes, however there is little information on these species. Small mammal inventories have been carried out at Wilmer (Simpson and Kelsall 1978) and bat surveys have been carried out in the general area (Holroyd et al. 1993, Rasheed and Holroyd 1995).

Passerines (Songbirds): The deciduous forest communities in the WMA provide important habitat for songbirds. Deciduous communities are largely restricted to moist, riparian zones in the East Kootenay Trench, and the Columbia Wetlands provide the largest contiguous tract of this valuable habitat type. This habitat type is of concern in the East Kootenay (Jamieson and Ohanjanian 1993). Some surveys of nesting birds have been carried out in the marshes as part of a larger survey of the Columbia Valley (Leung and Simpson 1994). The Wilmer Unit of the Columbia National Wildlife Area and the alluvial fan of Horsethief Creek are especially important areas for a variety of warblers and other songbirds (L. Halverson, pers. comm.). Recent research by the Canadian Wildlife Service and others have found that deciduous riparian habitats are very important for migrating song-birds, as resting and feeding areas during migration (R.

Millikin, pers. comm.).

Raptors: The Columbia valley is a major flyway for many species of hawks and eagles during the spring and fall migration. A wide variety of raptors also use the marshes as summer habitat (Pringle 1979). Ospreys and bald eagles are very common. Turkey Vultures are seen in this area, although this is close to the northern extent of their range. Peregrine Falcon, Prairie Falcon and other hawks and owls of concern are visitors to the area but there are no known nesting areas.

Cavity Nesters: The Pileated woodpecker is the most important primary cavity excavator and is a forest bird of concern in the East Kootenay (Ohanjanian 1991). This species requires large black cottonwood and western larch trees and snags as nesting habitat. These birds use large diameter cottonwood in the wetlands for nesting and their abandoned cavities are used by a wide variety of other species. Risks to the other habitats they use (logging etc.) increases the importance of these deciduous trees for the maintenance of this species. There are also a wide variety of secondary cavity nesters (birds using cavities created by other species) in the wetlands. Birch snags are also important for tree swallows, violet green swallows, chickadees and other small cavity nesters (R. Ferguson, pers. comm.). There are little inventory data available on their use of the wetlands, although they are common, especially in cottonwood snags (L. Halverson, pers. comm.). Kingfishers and swallows also use cavities excavated in the clay banks along the wetlands.

Amphibians and Reptiles: The wetland and riparian areas of the Columbia wetlands are the largest and most important area in the region for maintaining populations of several species of amphibians and reptiles, including the leopard frog, painted turtle, rubber boa, and other species of management concern in this region (see Appendix II.).

Invertebrates: Very little work has been done on butterflies and moths in this area although there is some information on dragonflies (J. Shepherd, pers. comm.). The provincial museum plans to do some work on freshwater mussels in 1998 in the East Kootenay (S. Canning, pers. comm.). Mussels do occur in Windermere Lake, but are unlikely to occur in the wetlands since they require a gravel substrate on the river bottom.

3.3 FISHERIES

In the East Kootenay, fish species diversity is greatest in the larger water bodies, with 17 species present (Jamieson and Ohanjanian 1993a). The species diversity in Columbia and Windermere Lakes has benefited from their connections to major river systems and from the introduction of many species of sports fish. The Upper Columbia River supports a variety of sports fish including westslope cutthroat trout, rainbow trout, bull trout, mountain whitefish, largemouth bass (in Windermere Lake only), burbot (ling cod) and migrant kokanee. Many non sportfish species are also present throughout the wetlands including pumpkinseed, peamouth chub, northern squawfish, largescale sucker, longnose sucker and redbside shiner. (Griffith, 1994). These species are an important food source for many of the wildlife species found in the wetlands. Very little is know about these fish stocks. Burbot are presently being studied in Columbia Lake and their

numbers seem to be increasing. (B. Westover, pers. comm.). The upper Columbia River is also an important migration route, particularly for spawning kokanee from Kinbasket Lake.

3.4 RARE AND ENDANGERED SPECIES

The species of greatest concern in the wetlands are the Northern Leopard Frog and the White Sturgeon (Columbia River population). Both are listed as S1 or critically imperiled in B.C. (BC Conservation Data Centre 1998). There is little evidence that either species occurs at present in the wetlands. Two other species are listed as imperiled (S2), the Prairie Falcon and the Short-eared Owl. Both species have been observed in the wetlands but little is known about their status. There are several species that are listed as vulnerable (S3). Of these species, only one (bull trout) is considered vulnerable (G3) globally. The local status of all of these species is described in Appendix II, along with a description of species which are of local concern.

There are also several plants and plant communities that are of concern. These are also described in Appendix II.

3.5 RECREATION

Outdoor recreation activities are very important and popular throughout the East Kootenay region. The Columbia Wetlands offer opportunities for a range of recreational activities including wildlife viewing, hunting, fishing, trapping, photography and nature appreciation. The Columbia River provides one of the very few opportunities for a 3-5 day canoe or boat trip through semi-wild country remaining in the Kootenay Region.

3.5.1 Wildlife Viewing

The Columbia Wetlands and adjacent areas provide opportunities for wildlife viewing from Highway 95, from several roads which traverse the floodplain, and from a boat or canoe on the river and wetlands. In early spring elk, deer, bighorn sheep and moose can still be seen on their winter ranges, and waterfowl are beginning to reappear. As many as 1,200 tundra swans have been observed in the wetlands in mid-March, and many geese and ducks have also returned. By mid-April, geese may be observed nesting on the muskrat push ups, islands, and artificial nest platforms built by local rod and gun clubs. Herons can be seen returning to one of the several large heron rookeries found in the wetlands. Nesting birds occupy the wetlands throughout the summer, along with muskrats, beavers and white-tailed deer. By mid-August, the early fall migration begins. Single day counts of 14,000 waterfowl have been observed during the peak of the fall migration in late September, while small numbers of mallards, goldeneye and geese remain in the area until freeze up. By this time, elk and deer are returning to their winter ranges in and adjacent to the wetlands.

Although there are no recent studies, Pedology et al. 1983 indicated that 86,000 recreation days were spent wildlife viewing in 1980 and projected non-consumptive use

at 144,000 recreation days in 1990. Both the resident and tourist population has grown greatly since 1980, and it is believed that growth in non-consumptive use of the Columbia Wetlands has increased significantly in recent years. A detailed development plan for wildlife viewing in the wetlands has been carried out (Sylvan 1991). They suggest the development of several viewing sites along the wetlands.

3.5.2 Waterfowl Hunting

Waterfowl hunting is an important use of the wetlands in the fall. In previous decades waterfowl hunting was much more extensive than it is today. In the 1930's there were at least two hunting lodges on the wetlands, catering to bird hunters (W. Wolfenden, pers. comm.). Today, local hunters account for the majority of the hunters. The National Wildlife Area lands at Spillimacheen, Reflection Lake at Golden, Bergenham Wildlife Sanctuary and Burges and James Gadsden Provincial Park are closed to hunting.

3.5.3 Big Game Hunting

The East Kootenay region is one of the most important hunting areas in the province and is recognised internationally as a big game hunting area. The Columbia Wetlands provide critical wintering habitat for deer, elk and moose. The marshes are used extensively by local hunters in September and October.

3.5.4 Fishing

Populations of rainbow trout, bull trout, mountain whitefish and burbot are found in the main Columbia River and lower reaches of tributary streams. Sport fishing is concentrated on rainbow trout in the spring, and mountain whitefish and bull trout in the fall, generally at the mouths of major tributary streams. In general these rivers and streams are relatively unproductive due to their glacial origin.

3.5.5 Boating

The wetlands and the channels of the Columbia River have been used for decades by canoeists and other boaters. In recent years there has been some use of the river channel by jet boats and more recently, by personal water craft (jet-skis).

3.5.6 Winter Use

The wetlands are also used in the winter by cross-country skiers and snowmobilers, primarily adjacent to the communities along the wetlands. Use would appear to be higher at the north end of the wetlands where there are greater snow depths.

3.6 COMMERCIAL WILDLIFE USE

Four big game guiding operations in the upper Columbia occupy territories in the mountains on either side of the Columbia Wetlands. The wetlands provide critical winter habitat for the big game species upon which the guides depend; the wetlands therefore contribute in a very important way to the viability of these guiding operations. Little guided hunting occurs in the wetlands except late in the season.

There are several traplines in the wetlands. Trappers take a variety of wetland fur species, the most important of which are beaver and muskrat.

The popularity of commercial wildlife viewing expeditions has been increasing world-wide over the last ten years. In the Columbia Wetlands, two operations have carried out interpretative float trips for several years, primarily in the Golden area. One unlicensed operator has recently initiated jet boat tours in the Invermere area. A variety of other operations have started up in recent years or are planned for the future, as is discussed later in this report.

3.7 HERITAGE AND CULTURAL VALUES

The Columbia River system has a long history of occupation by indigenous peoples and there are numerous archaeological and traditional use sites of importance to native people in the wetlands. Artefacts dating from 5,000 to 7,000 years ago have been found at Windermere, and this is only one of many sites in and around the Columbia Wetlands (W. Choquette, pers. comm.). Camps and settlements of the K'tunaxa people, as well as dozens of underground pit houses of the Shuswap people are located between Canal Flats and Golden. Prior to the development of hydro-electric projects downstream, the Columbia River was a major salmon river. Salmon were an important staple for the K'tunaxa and Shuswap peoples (see Salmon in Appendix II.).

3.8 AGRICULTURE

Flooding, high water tables and climate all limit land capability for agriculture within the Columbia Wetlands. Opportunities for dyking and conversion of marsh areas to agriculture use are limited by high drainage costs, high dyking costs and poorly drained soils. Attempts to dyke portions of the wetlands in the past have not been successful (E. Rasmansen, pers. comm.). There is very little of the wetlands that is in the Agriculture Land Reserve. Where private lands occur in the marshes they are sometimes used for late season grazing at low water levels. There are two Crown range permits in the wetlands: one at Radium (E. Garbowski) and one north of Brisco at the outlet of the Bugaboo River (P. Feldmann).

3.9 FORESTRY

Commercial forest occurs only on the few sites with better drainage capabilities, but the extent of these areas is limited (Jamieson 1996, Jamieson and Ohanjanian 1993). The majority of potential commercial forest types are found between Moberly and Donald, however most of this area is within the riparian zone and there are substantial limitations to harvesting options. The forest sector indicated during the CORE process that this area was not of importance to their industry.

3.10 MINERAL VALUES

Mineral values may occur at depth under the wetlands but would be difficult to access due to the deep overburden of silts and gravel that lie beneath the marshes. Oil and gas reserves, if found under the wetlands can probably be accessed using directional drilling from sites adjacent to the wetlands.

4.0 PLANNING PROCESS

4.1 DATA GATHERING

This operational plan is based on the strategic direction provided in the proposal that lead to the creation of the WMA (Jamieson 1996). The recommendations of the Regional Land Use Planning Table concerning the future management of the area and the Regional Land Use Plan were also considered. Management plans from several other areas were consulted (Anon 1990, 1994, 1995, Jamieson 1996a) as well as the Planning Guide to Wildlife Management Areas (Wildlife Branch, Ministry of Environment, Lands and Parks 1996.). A literature review on the impacts of recreational use on a variety of wetland species was carried out.

4.2 PUBLIC CONSULTATION

Discussions with a variety of interest groups were carried out as the plan was being developed. Three public meetings were held, in Invermere, Brisco and Golden on Nov. 12-14, 1997. A comment sheet was provided at all of these meetings. An assessment of this input and a review of all the meetings held is included in Appendix I. In January 1998, after all comments had been received, a letter describing what we had heard was sent out to all people that had provided addresses in the registration list for the meetings or through other contacts. Where possible, the weight of public comment on different issues is noted in the text of the management plan. All of the information received during this process is included in a file available at the Wildlife Branch, Cranbrook.

5.0 MANAGEMENT PLAN

5.1 VISION AND GOALS

The following vision, goals and guiding principles have been developed to guide management actions in the WMA. They are based on a draft vision and goals that were provided to interest groups and to those who attended the public meetings. These draft statements were supported by the majority of those who returned the comment sheets.

VISION

- **The Columbia River Wetlands will continue to function as a flood-plain ecosystem with a complex biological community governed by natural fluvial and ecological processes.**

Almost everyone consulted wanted to see the wetlands remain in a natural state, allowing full rein for natural processes to occur uninterrupted. Several individuals and groups made the point that the Upper Columbia River is the only portion of the main stem Columbia that remains uncontrolled by dam flows. (Wetland and riparian cottonwood habitats are severely restricted in the Columbia Basin as the result of dam construction and other human activities (Jamieson and Ohanjanian 1993)). It is one of the few remaining natural waterways remaining in the entire Columbia Basin..

GOALS

PRIMARY GOAL

- **To maintain self-sustaining populations of indigenous fish, wildlife and plant species in the Columbia Wetlands WMA.**

There was unanimous agreement among those consulted that maintaining wildlife values should be the major goal in the WMA.

SECONDARY GOALS

Goals for the maintenance of fish, wildlife and plant communities.

- **To maintain wildlife populations at the long term sustainable carrying capacity of the natural habitats in the WMA.**

There was little interest expressed in increasing or maintaining any species at artificially high levels, for any purpose.

- **To manage wildlife populations and plant communities to ensure balance and the continuance of all indigenous species.**

There was general agreement that all species in the wetlands were important and that management prescriptions should consider the full range of plant and animal species. The health of heron rookeries, for example, should not be compromised by management to increase the numbers of Canada geese.

- **To enhance habitats where there will be no or minimal impact on the natural evolution of the landscape and where enhancement replicates or replaces natural processes.**

Most people were opposed to any habitat enhancement projects that would have a major impact on the present ecological processes and aesthetic values in the wetlands.

Goals for Human Use of the wetlands.

- **To maintain a sense of wildness and solitude in the WMA.**

From our discussions with people who use the wetlands it is obvious that one of the major attractions of the wetlands is the opportunity to get away from the noise of human communities and into a natural, quiet landscape. The majority of people consulted appreciated the un-crowded, high quality wildlife viewing and recreational experiences that the wetlands provide. To the degree possible, managers should try to maintain the quality of experience for people using the wetlands. For most people this means a low level of other visitors and other human activity seen or heard.

- **To maintain the aesthetic quality of the wetlands.**

The wetlands provide the foreground for an exceptional mountain viewscape. That viewscape is an important attraction both for visitors who enter the wetlands and for those who look down on the wetlands from viewpoints along Highway 95.

It is also very important to the people who live in the communities and on the farms adjacent to the wetlands.

- **To provide opportunities for the public to appreciate, study, and view natural landscapes, plant communities and wildlife in their natural habitats.**
- **To provide opportunities for First Nations people to carry on their traditional uses of the area.**
- **To permit opportunities for commercial tourism operations that encourage their clients to appreciate, study, and view natural landscapes and wildlife in their natural habitats.**

Those consulted generally supported commercial use in the WMA, but only those tourism activities related to the enjoyment of wildlife and natural landscapes.

- **To manage and regulate extractive resource uses that are compatible with the vision, goals and guiding principles of the WMA.**

Other resource uses (agriculture, forest harvest, mining) are provided for, but are subject to the goals established above. The nature of the landscape is such that there are few options for these kinds of activities.

- **To provide opportunities for scientific study that will contribute to an understanding of the function and dynamics of the wetlands.**
- **To provide opportunities for the education of the public about the ecological processes at work in the wetlands and the goals and programs of the WMA.**

5.2 GUIDING PRINCIPLES

The following guiding principles will be applied to ongoing management decisions; they provide an interpretation of how the vision and goals of the WMA will be achieved. They are based on the goals set above and discussions with and comments from the people consulted during the development of this plan.

- **Principle 1: All activity that occurs in the WMA must have a neutral or positive effect on wildlife, fish and plant communities.**

Many of the people we talked to saw this principle as a "litmus test" for deciding what kinds of activities should occur in the wetlands. One of the greatest difficulties in assessing the acceptability of various uses of the WMA will lie in our ability to determine the potential impacts of human activities. Starting from the premise that any human activity will have some impact, and using this guiding principle, managers can decide and measure this impact and then decide if a particular use is acceptable, and at what level of use. It is likely that some activities will be unacceptable at any level while others will be tolerable at low levels of intensity, but intolerable at greater intensities. This kind of analysis will form the basis of an assessment of any proposed activity and a starting point for regulating that activity. Part of this assessment will be a consideration of cumulative effects, to ensure that the total impact of human activity does not have a negative impact on wildlife values.

- **Principle 2: Natural fluvial, climatic and ecological processes (flood, fire, natural changes in the river channel), will remain the primary determinant of the condition of the wetlands and other habitats.**

The Upper Columbia River flood-plain is an extensive, unique and mostly "pristine" area in terms of hydrological and ecological processes. The primary objective will be to maintain the wetlands and surrounding habitats in a natural state. Managers will maintain a hands-off approach in attempting to manage or alter major natural processes in the area. This is the message we received from the vast majority of those consulted during the development of this plan. Direct intervention to repair or diffuse natural processes will be considered only where potentially catastrophic changes may occur that will impact on the survival of endangered species or will impact on private lands in or adjacent to the wetlands.

The natural processes that most affect the wetlands are:

Annual Flooding: The Columbia Wetlands are a natural, dynamic system that is changing continuously as a result of annual spring flooding and flood episodes such as occurred in 1948. Flooding can have positive and negative impacts on the habitats found in the wetlands. Horsethief Creek, for example, could alter its course during a spring flood and run into the Wilmer Slough, drastically altering its value as a wetland. In the very long term (100-200 years), this kind of change may be a benefit to the productivity of the area, but in the short term it would

have major impacts on waterfowl values and the aesthetics of the area. It would be tempting for managers to try to alter the stream course back to its original channel to maintain present values in the wetlands. More subtle changes (e.g. cottonwood mortality as a result of beaver activity, changes in wetland vegetation as a result of fluctuations in muskrat populations) could provide even more difficult decisions for managers.

Wildfire: There is little data on the pre-historic level of fire in the marshes and what impact that might have had on the original, pre-settlement ecological processes. The adjacent forests burned on a relatively short cycle (40-80 years) in the south portion of the wetlands, but on a longer cycle in the wetter forests at the north end. Natural fires, if they occurred in the wetlands, probably occurred in the early spring and fall at low water levels. From the 1940's to 1960's, fire was used as a management tool to benefit cattle grazing and wildlife use. The most recent management burn was carried out in 1988 at Twelve Mile Slough south of Nichol森. Recent work on burning in the wetlands (Ferguson 1997) suggests that enhancement burns do not increase the forage quantity in sedge meadow systems, but may be a factor in providing high quality browse.

Until better data are available on historic levels of fire, enhancement burns will be used very conservatively; if at all, with strict guidelines to ensure that all wildlife and plant species are considered before burning is attempted. Wild fires will be put out with the assistance of the B.C. Forest Service. A "let burn policy" is not an option in this area since there is extensive human activity and private land in nearby areas.

Beaver and muskrat populations: Beaver and muskrat populations are important ecological factors in the wetlands, as are the natural fluctuations of their populations that occur. Beaver can have a major impact on the survival of cottonwood and other deciduous trees. Muskrat alter the density of reed and cattail stands in the process of building their push-ups. These species will be managed conservatively (low rates of harvest) until the dynamics of these species, their food supplies, and predation are better understood. Trapping will continue as an existing use, subject to the goals and principles expressed here and subject to the annual trapping regulations.

- **Principle 3: Only wildlife habitat enhancement projects that do not compromise natural processes in the wetlands and have minimal visual impact, will be considered.**

Most people consulted were emphatic that major human interventions, such as the dyking and water control projects that have taken place at the Creston Valley Wildlife Management Area, should not occur here. In addition, the dynamic fluvial processes that occur (annual flooding and other natural processes), dictate that only relatively minor habitat alterations are possible without excessive expense and high annual operating cost to maintain such structures. In general, the Columbia wetlands do not lend themselves to a high level of habitat

enhancement. Rather, the objective will be to allow natural processes to maintain, and at times, alter natural habitats.

During the public input process it was suggested that habitat enhancement occur only where local impacts in similar habitats (i.e. loss of cottonwood stands and cavity nesting options adjacent to the wetlands) need to be mitigated. However, the Wildlife Program may also need to consider losses in these habitats across the basin and continent, especially where rare or endangered species are concerned. Because habitats are being lost or modified on regional and larger scales, wildlife managers may have to consider the efficacy of enhancements of wildlife habitats or wildlife populations on lands that have been secured for wildlife purposes. Such actions will only be taken for species that presently occur in the wetlands, or did occur in the past.

Therefore, within the constraints imposed by natural biophysical processes within the WMA, efforts may be made to:

- Improve habitat for selected species or species groups to maintain regional populations at desirable levels.
- Introduce or re-introduce species which are endangered or of management concern regionally, provincially or nationally.

In so doing, a concerted effort will be made to keep enhancement techniques as “natural” and “natural-looking” as possible while efficiently achieving the desired results. Nest boxes, for example, would be designed to blend in with the natural vegetation.

- **Principle 4: Management effort will be directed at the entire range of species present, with special consideration given only in the case of endangered species.**

A diversity of wildlife species live in the wetlands. Management effort will be directed at the entire range of species present, except in the case of endangered species. One species will not be increased at the expense of another, except in the case where recovering an endangered species requires the control of another species (a predator perhaps) for a specific time frame.

- **Principle 5: Endangered or threatened species for which appropriate habitats exist in the WMA, will receive particular attention in the management of the area.**

The nature of the wetlands and the species present are such that there do not seem to be any immediate concerns relating to endangered species, with the exception of leopard frogs. If such concerns arise in the future, then that concern should be addressed as a priority in the WMA. The greater the geographic scope of the risk of endangerment, (at risk across the continent, vs. being at risk in B.C. or in the Kootenay), the higher the priority for habitat enhancement and population management in the WMA.

- **Principle 6: Public use that encourages the enjoyment of wildlife and natural landscapes will be given priority over other uses.**

Public use, enjoyment and study of fish and wildlife and their habitats will be accommodated where and when it can be established that those uses are not in conflict with the goals and guiding principles described above. The people consulted were almost unanimous in supporting this approach. Activities that are not related to the enjoyment of wildlife and landscapes will be given low priority. (For example, canoe or boat races, fishing derbies or water ski regattas would not be considered as acceptable activities).

- **Principle 7: Existing uses, as described in the "East Kootenay Table Columbia River Marshlands Agreement" will continue in the WMA.**

The "East Kootenay Table Columbia River Marshlands Agreement" developed by several "interests" at the East Kootenay Negotiating Table (CORE 1995), was signed by all of the participants in that process. According to that agreement, the primary objective of the WMA should be to maintain wildlife habitat values and allow for the continuance of existing uses (hunting, fishing, wildlife viewing, camping and hiking) that have occurred for many years in the wetlands. Trapping and the use by two commercial nature tour operations were also recognised as existing uses of the area. Visual quality was also recognised as important, as were cultural and heritage values associated with stern wheeler docking sites. The grazing of domestic stock was also recognised as an existing use. However, on the assumption that the past levels or intensity of use were also a consideration in the sustainability of those activities, the level of use will be a determinant in future decisions regarding these uses.

- **Principle 8: Traditional use by First Nations will continue in the WMA.**

The Columbia Wetlands have been used by native people for several centuries as a gathering, fishing, hunting, trapping and settlement area. Their use of the wetlands will continue subject to agreements and regulations developed between MELP, the K'tunaxa Tribal Council, the Shuswap Nation Tribal Council and the Shuswap and Columbia Lake Bands.

- **Principle 9: A high quality recreational experience will be maintained for those using the wetlands.**

At present, the wetlands see relatively low levels of human use. This use may increase in the future, eventually impacting on the quality of experience provided to visitors and on the productivity and health of plant and animal communities. The quality of experience may be affected at a lower threshold than the level of use that will impact wildlife populations. If and when this level of use occurs, human use in the wetlands will be managed to maintain a high quality experience for visitors and to minimise impacts on vegetation and wildlife populations.

5.3 SHORT TERM OBJECTIVES

Specific objectives for the management of the WMA (i.e. tasks that can be accomplished within a specific time-frame) are difficult to set at this point since there is insufficient baseline data on wildlife and plant communities in the wetlands. The primary objective of managers in the 1998-2002 period should be:

- **To develop a better understanding of the “ecological history” of the wetlands to identify factors that may affect the present status of the wetlands.**
- **To establish a long term monitoring program to measure changes in plant communities.**
- **To establish baseline data on fish and wildlife populations.**

Based on this information, specific habitat and population objectives may be set in the next generation of this management plan.

The options for habitat management, wildlife and fisheries population management and the management of human activity are provided below.

5.4 HABITAT MANAGEMENT

There are a variety of options for enhancing wildlife values in the wetlands. However, these options are limited by both public concerns and physical conditions, as expressed in the guiding principles described above. The projects that appear to have public support (i.e. minimal impact on the landscape) and are technically sound, are described below, for each major habitat type. More detail on the design of these potential projects is provided in Appendix IV. Options that will not be considered are also listed with an explanation of why that option will not be considered.

5.4.1 GENERAL HABITAT ISSUES

There are three areas that should be considered that are not directly related to specific species or habitat types, but are important tools for monitoring overall ecosystem health.

1. Vegetation and land form monitoring: Tools should be developed that will allow managers to identify long term changes in vegetation and in the river channel. Historic photographs of the wetlands should be collected and archived. Air photos of the wetlands dating from as far back as possible, should be collected and maintained. Photos should be taken of marked sites in the wetlands every five years and during major flood events. The objective would be to document change in the ecological condition of the wetlands. A sampling of vegetation types and mapping of sample sites should also be considered, along with surveys for rare and endangered plant species.

2. Water quality monitoring: In the long term, potential pollution of the Columbia River and its tributaries could have a major impact on the ecosystem health of the

wetlands. Records of water quality, including nutrient loading, should be collected and archived.

3. Documenting the ecological and human history of the wetlands. A better understanding of the factors that have defined land forms, vegetation and wildlife numbers in the past will assist in managing the WMA in the future. Information on the pre-contact status of the wetlands, especially in terms of the nutrient input provided by salmon, should be investigated. The impact of human activities on the wetlands post-contact should also be considered and documented, up to the present era.

5.4.2 FLOWING WATER

The Columbia River and its tributaries provide important habitat for several fish species and a variety of birds and mammals that depend on that fishery. The species most commonly seen on the river itself are beaver, otter, osprey, bald eagle, common merganser, kingfishers and in spring and fall, staging waterfowl. Portions of the shoreline are also used by wading birds.

Habitat management options include:

1. Baseline surveys of fish populations. The Columbia River and associated wetlands presently do not support a major recreational sports fishery. It does, however, support significant populations of non sport fish that in turn support a wide variety of wildlife species. Potential habitat changes that could affect these fish populations are difficult to predict without some baseline life history data on all of the fish populations in the system. Fisheries surveys should be carried out on a 5 to 10 year cycle to document potential changes due to pollution, silt load, climate change, etc.

2. Identification of old salmon spawning areas. Investigations related to the treaty process may identify areas used by salmon prior to the closure of the dams on the lower Columbia. These sites have historic and interpretative value. In the long term, some interest has been expressed in seeing salmon re-established in the Columbia River system and these sites would be of importance if this was considered.

3. Maintenance and improvement of spawning areas on the major tributaries. Although the main channel of the Columbia River is silt bottomed for most of its length, the tributary streams have gravel bottoms and may provide good spawning habitat. Little information is presently available, but as information is acquired, there may be options for habitat improvement for a variety of species. Burbot and bull trout will be the focus of this work. Major spawning channel developments (as at Meadow Creek) will not be considered in the WMA, unless required for the maintenance of a species at risk.

5.4.3 OPEN WATER PONDS AND LAKES

There are several larger ponds with extensive areas of open water and relatively deep water (>2 m). These ponds support coarse fish and are important to osprey, eagles, otter and other species. Thurber (1983) indicates several of these ponds as osprey feeding areas. They are also used by staging waterfowl. Where these lakes drop in level in the fall, they provide mud flats used by shore birds and other species.

Habitat management options include:

1. Baseline surveys of fish populations. The open water wetlands should be included in the baseline studies recommended in the previous section.

5.4.4 MARSHES

This is the most prevalent habitat type in the wetlands. Marshes here are highly variable and different plant communities occur, depending on site-specific conditions. Although these marshes are excellent staging habitat for migratory birds, annual flooding and the lack of upland nesting sites result in poor nesting success for most species of waterfowl. Water management projects (dykes and water controls) could be used to enhance certain habitats and increasing the productivity of the wetlands for a wide range of wildlife species in the Columbia Wetlands. However, the options for these kinds of habitat management actions are limited by:

- the low cost:benefit ratio of major enhancement works due to the high construction and maintenance costs
- aesthetic considerations
- the lack of suitably juxtaposed and flood-safe upland nesting areas for many species of ducks
- a lack of public support for high impact enhancement projects.

Large scale dyking and pumping projects were considered in the 1970's, the period during which DU's Moberly Marsh Project was constructed. At that time, consideration was being given by British Columbia Hydro to the channelization of the Columbia River to accommodate the increased flows that would have resulted from the Kootenay Diversion hydro electric project. Ducks Unlimited did surveys looking at developing wetland areas adjacent to the channel (Pelletier 1974, Hennan 1975, Carson 1976). Moberly Marsh is the only one of these projects that was carried out. One small DU style project has been carried out in recent years on private land near Parson.

Projects of this kind will not be considered in the future with the one exception described below.

1. Managing water levels in wetlands isolated from annual flooding by the CPR grade: There are several sites along the east edge of the wetlands where the railway grade acts as a "control structure" and marshes have developed that have more stable water levels than are found in the wetlands system itself. Diverting nearby stream water into some of these areas to maintain water levels, may be an option in a few cases. This

option is presently being considered for Reflection Lake at Golden by the Columbia Basin Fish and Wildlife Compensation Program.

Other habitat enhancement options include:

2. Goose Nesting Platforms: Local rod and gun clubs have installed a large number of goose nesting platforms in the wetlands over the last twenty five years. Goose nesting success and goose populations have increased substantially as a result. However, since geese arrive earlier in the spring and/or are more aggressive than osprey or herons, they have taken over osprey and heron nesting sites, to the potential detriment of these species. Goose populations are also high enough now that their impact on hay fields has become a concern to local ranchers. As a result, the platform construction program has been curtailed. The long term objective will be to maintain and replace goose nesting platforms only in areas located away from the major heron rookeries and, for aesthetic reasons, away from marshes that are obvious from Highway 95. The Wildlife Program will work with local rod and gun clubs and other interest groups to maintain the number of nesting platforms at the present level or at a level that does not impact on other species or on aesthetic values.

3. Floating Nesting Platforms: Small, floating nesting platforms (too small to be used by geese) have been suggested as a option for improving nesting success for those species that nest over water, however there is no literature on the effectiveness of small platforms. The creation of loafing and grit sites area also options that might be considered in the long term. None of these options appear to have applicability in the Columbia Wetlands in the immediate future.

5.4.5 LEVEE VEGETATION

One of the most important habitat types in the wetlands is the deciduous habitat found along the river levees and stable portions of the flood plain. This type is typically composed of large, old cottonwood trees with a thick shrub cover of red-osier dogwood, alder, rose and willow. Where there are large cottonwood stems, they provide important cavity nesting sites for pileated woodpecker and the variety of species that use their abandoned nest holes, such as wood ducks, mergansers, goldeneye, bufflehead, kestrels, tree swallows, and red squirrels. Eagles, osprey and blue herons also nest in these trees. The trees and shrubs are also important nesting areas for a variety of songbirds. These sites are also used as feeding areas and for bank houses by beaver. In winter these sites are used by moose and other ungulates as browsing areas, resting sites and travel corridors.

Habitat management options include:

1. Status of cottonwoods stands: Several people have observed what appears to be a decline in vitality of cottonwood stands along the levees in the wetlands. There appears to be large numbers number of small, yet decadent trees in some parts of the wetlands. Preliminary work (Ohanjanian, and Teske. 1996) indicates that there are concerns with the status of cottonwood stands in the

wetlands. Old growth is the most limited age class. Relic, old trees occur in remnant, highly fragmented locations throughout the marshes but large, intact stands are rare. The largest such stand is found on private land at Nicholzen. The largest contiguous stands of mature (not old growth) trees occur south of Moberly, at Spillimacheen and at Horsethief Creek. Mature trees found along the levees between Brisco and Parson (with the largest concentration occurring in the Spillimacheen area) show much breakage and decay. It is doubtful that many of these trees will ever reach a large diameter (>60 cm) which is optimum for pileated woodpecker nesting, and beneficial for heron colonies and bald eagle nest construction.

Immature trees are found throughout the Columbia marshes. A mixture of age classes indicates that recruitment is successful and that reproduction, either clonal or through seed, is occurring, or has occurred in the past. Many of the “ribbons” of mature cottonwood that occur along the river courses, however, are remnants of old stands, and do not show a variety of age classes. In many places the scattered snags and partially dead trees which remain are accompanied by an understory not of young cottonwood, but of birch, alder, willow or shrubs. These stands are common between Radium and Parson but are of questionable viability in the long term.

Further work is required to:

- Identify age class structure and process in cottonwood stands.
- Identify agents causing early decay characteristics in younger and mature trees. affecting the survival of older age cottonwood stands.
- Determine if there are significant differences between long term mortality and recruitment rates in cottonwood stands.

More detailed work on this issue should be considered a priority.

2. Protection of older age cottonwood stands: A major mortality factor in older age cottonwood is falling by beaver. Low beaver pelt prices in recent years may mean that beaver populations are higher than they may have been in earlier decades. Projects have been carried out on the Kootenay and Elk Rivers to protect cottonwoods by wrapping wire mesh around their base. Monitoring of these projects suggests that this strategy is effective (P. Ohanjanian, pers. comm.). Some cottonwood protection has been carried out by the CBFWCP in the wetlands.

Further projects of this type should be considered in the wetlands, with eagle and osprey nesting trees and heron rookeries as a priority.

This strategy may not prove effective in the long term if protecting older age cottonwoods results in the beaver shifting to feeding on younger age cottonwood. If this is the case, then the beaver could remove the next generation of cottonwoods which would result in a shortage of older age cottonwoods 50-100 years from now. An alternative would be to encourage trappers to take more beaver and maintain beaver populations at a low level, however this is unlikely to be popular with the general. Further consideration of this problem may be required if the assessment of recruitment to cottonwood stands finds that, in fact, older age cottonwood stands are at risk.

Protection of heron rookeries: The sites used by blue heron for nesting could be identified as critical wildlife areas within the WMA. However, there has been some shifting of nesting sites in recent years (W. Houlbrook, pers. comm.). If this kind of protection is considered necessary, the most effective strategy would be to classify all the older age cottonwood sites as critical wildlife areas.

4. Platforms for Bald eagles, osprey, and great blue herons: These birds respond to the erection of nest platforms, a measure that could be considered if populations were at critically low levels. The preferred approach, however, is the maintenance of mature stands of cottonwoods throughout the WMA, coupled with protection of these sites from disturbance. It is unlikely that platforms could be designed that would not be used by geese. There is questionable public support for projects such as this that would be obvious man-made structures in the wetlands. No platforms will be built unless significant problems occur in the future with the status of these species. Consideration should be given to putting up platforms for bald eagles and osprey on adjacent benchlands at some distance from the wetlands (> .5 km) where the sites would be less likely to be used by Canada geese.

5. Creating natural snags: Girdling of mature conifers along the wetlands, to create snags could be considered if inventories revealed that natural cavities or natural nest platform sites were limiting nesting for cavity nesting birds. This approach would be more acceptable than artificial platforms or bird boxes in terms of maintaining the natural character of the area, but should await the results of the cottonwood assessment. Mature cottonwoods will not be girdled since the decay characteristics of this species are such that they are already decadent before many of these reach adequate diameters for use by pileated woodpeckers, and since live deciduous trees are important for species such as thrushes and warblers and need to be maintained for these species.

6. Install nest boxes for cavity nesting birds. A variety of birds use cavities for nesting in this habitat type. The CBFWCP has about 120 nest boxes established in the wetlands at present. However, before a larger program is initiated, a survey should be carried out to see if a major nest box program can be justified. If there are sufficient natural cavities, i.e. there are numerous natural cavities that are not being used (given that home range and food availability are not limiting), then such a program may not be productive. Species that should be considered include wood ducks, mergansers, bufflehead, kestrels and tree swallows. A nest box program is ongoing at the CVWMA, but maintenance problems have limited its success (B. Stusnoff, pers. comm.). The local, regional, provincial and continental status of the cavity nesters affected should be considered in defining the extent of such a program.

7. Songbird surveys. Riparian areas are important as nesting areas for songbirds. Nesting surveys should be carried out to provide baseline data on their use of riparian habitats in the WMA. These areas also play a very important role in providing stop-over sites for songbirds during migration. A program of developing monitoring sites for songbirds migration is developing in B.C. The establishment of such a site in the wetlands should be supported.

5.4.6 MIXED FORESTS ON FLUVIAL FANS

In several areas where side tributaries enter the wetlands there are alluvial fans that support a mix of deciduous and coniferous forest, shrub and meadow areas. These are very important sites for wintering ungulates. The majority of the elk seen in aerial surveys are found on these sites (L. Ingham, pers. comm.). These are also very important areas for song birds and cavity nesters.

The most important of these sites are:

Horsethief Creek - A mix of provincial and federal Crown lands and private land.

Forester Creek - A mix of provincial Crown and private land.

Kindersley Creek - Private land.

Luxor Creek - Private land.

Templeton Creek - Almost entirely private land.

Bugaboo and Spillimacheen Rivers - A mix of private, provincial and federal Crown land.

Canyon Creek (Nicholsen) - Almost entirely private.

Twelve Mile Creek and the alluvial fan of an unnamed creek south of Twelve Mile Creek

Kicking Horse River (Golden) - Entirely private, townsite of Golden.

Blaeberry River - Private.

Options on Crown land are limited on most of these sites. Further, some people that we consulted felt that these areas should be left to return to older age forest and that habitat enhancement should take place on adjacent benchlands rather than in the WMA.

Habitat management options include:

1. An assessment of habitat management options on these sites and adjacent areas:

An assessment of enhancement and protection options should be developed for each of these sites where there is significant provincial Crown land. These sites are at the outflow of Horsethief Creek, Forester Creek, Bugaboo Creek and Spillimacheen River. The full range of options on these sites should be considered.

2. Work with private land owners. Based on the results of the assessment, a program could be developed to work co-operatively with land owners in these areas to maintain and enhance wildlife values.

3. Cottonwood and bird surveys: Since many of these sites contain cottonwood as part of the stand, these areas should be included in survey of cottonwood status, the program for protecting older age cottonwood, the survey of cavity nesting birds and songbird surveys suggested above.

5.4.7 SEDGE MEADOWS

There are extensive sedge meadows in the wetlands that are used by elk in winter. Some work has been completed recently on the use of this habitat type in the Nicholson area. This habitat type may also be important for some bird species and small mammals, however that use is limited by annual flooding of most of these sites.

Habitat management options include::

1. Bird surveys: This habitat type should be surveyed to identify bird use, including use of the mud flats left after temporary wetlands drain out in the late summer and fall, by shorebirds.

2. Enhancement burns for ungulates: Prescribed fires have been used in the past to improve habitat for ungulates in the wetlands. In the winter of 1996/97, the Golden Rod and Gun Club funded a project that looked at the primary habitats and key forage species of elk in that area (Ferguson 1997). As part of that study he burned two small plots in the sedge meadow type. He found no significant difference between production (kg/ha of forage produced) on burned and unburned sedge sites in the following fall. This would suggest that enhancement burns in sedge meadow communities are of marginal value for ungulates.

5.4.8 SHRUB COMMUNITIES

There are extensive shrub communities in the slightly drier portions of the wetlands, supporting alder, willow, hawthorn, red osier and high bush cranberry. These are important habitat areas for moose, elk, white-tailed deer and a variety of songbirds. Shrub thickets total 1,100 hectares and make up 4% of the study area.

Habitat management options include:

1. Songbird surveys. These habitats should be included in nesting and migrant use surveys. These inventories should be carried out prior to any extensive enhancement work for ungulates is initiated.

2. Browse rejuvenation by slashing or burning. There is some indication that burning in the wetlands may rejuvenate decadent willow stands and potentially makes more browse available (B. Ferguson 1997), however there are no good data on this issue. Further work is required on the degree to which burning increases the availability and palatability of browse and the degree to which ungulates depend on deciduous browse in the wetlands in severe winters.

There are several practical issues in relation to enhancement burning in the wetlands.

- After at least two decades without burning, litter and dead material has built up around the base of many willow plants. When this material burns it may kill the plant.
- There are major concerns about the loss of cottonwood stands in areas adjacent to

enhancement burns.

- Present ungulate populations do not appear to be utilising even a minor proportion of the available browse (based on observations by one of the authors during field work in the fall of 1997), following a very severe winter. Ungulate populations do not appear to be even close to habitat carrying capacity, at least as defined by the browse component of their diet.
- Smoke and air quality issues may be a concern, especially close to the larger communities.

Based on these arguments, enhancement burning will continue to be considered as part of the array of management tools available, but no burning be attempted in the first five years of the management plan or until there is good scientific evidence of the benefits of this kind of enhancement in these habitat types.

5.4.9 RIPARIAN FLATS - MOBERLY TO DONALD

Between Moberly and Donald there are extensive areas of riparian river flats. This area provides important thermal and snow interception cover for wintering moose. It also provides important scenic values from along the TransCanada Highway and may be a unique example of a "boreal spruce" type created by a frost pocket. Logging options in this area are severely restricted by Forest Practices Code restrictions in riparian areas. No enhancement will be attempted in this area. The vegetative uniqueness of this site should be investigated.

5.4.10 OTHER WETLAND HABITATS

Bogs, fens and "swamp" (wet areas that support shrubs and small trees) were identified in the vegetation classification carried out by Pedology Consultants et al. (1983). These types occupy a very small proportion of the wetlands. No enhancement action will be considered in these types.

Non-vegetated areas (river bars and mud flats) were also identified in Pedology Consultants et al. (1983). These areas are important for shorebirds, however there are few habitat enhancement options in such habitats.

5.4.11 HABITATS ADJACENT TO THE WETLANDS

Clay cliffs: There are several sites along the wetlands where clay cliffs and banks provide nesting sites for bank and northern rough-winged swallows, belted kingfisher, owls and other cavity nesters.

Habitat management options include:

1. Identify sites used by bank nesting birds: The major sites should be identified using standard survey techniques (Ethier 1995).

2. Protection of swallow nesting sites: The sites used by swallow and other birds for nesting could be identified as critical wildlife areas where they occur within the WMA.

3. Protection of sites on adjacent private land: As a first step, land owners should be notified concerning the value of these sites, in the long term conservation easements could be considered for the major sites. Many of the sites are located in the cut created in the development of the railway grade and are on the CPR right-of-way.

Rubble and steep rock habitats: The wetlands run along the steep base of Steamboat Mountain between Edgewater and Brisco. There are several steep rock sites adjacent to the river that may support rubber boa snakes (observed by I. Jack) and perhaps some other reptiles or small mammals of concern.

Habitat management options include:

1. Investigate these sites for the presence of reptiles or small mammals of concern: Standard survey techniques should be applied.

2. Protection of sites if species of concern are found: Such areas should be designated as critical wildlife areas if necessary.

Adjacent forests: There are extensive coniferous forests along the west side of the wetlands. These areas may be important in providing nesting habitat for wetland birds requiring cavities for nesting and other species living in the ecotone between wetland and forest.

Habitat management options include:

1. Protect older age Douglas fir sites: Along the slopes of Steamboat Mountain there are some Douglas fir stands over 500 years old (I. Jack, L. Halverson, pers. comm.). Values on these sites should be assessed. If justified, these areas should be given critical wildlife habitat status or treated as old growth areas under the FPC. Qualifying trees should be registered with the British Columbia Conservation Data Centre.

2. Maintaining cavity nesting sites and other wildlife values: There are a variety of bird and mammal species that use the forest adjacent to the wetland. However, there is little information on what species use the wetland-forest edge and the effect logging may have on their habitat. Studies of bat species, songbirds, cavity nesters and other species are required, in co-operation with the forest companies involved to identify the needs of species that are not considered under the Forest Practices Code. (Funding for such studies could come from Forest Renewal BC). Where it is found that specific species require special management or retention of old growth, then an agreement should be negotiated with the companies to ensure that these values are maintained. The visual impacts of logging on views from Highway 95 across the river is also an important concern.

Adjacent Farmland: Farm fields adjacent to wetlands are often used for nesting by certain species of ducks, especially mallard. Such nests are often destroyed by haying or grazing. An extensive program of leasing and managing grasslands (developing “dense nesting cover”) to increase nesting success of upland-nesting ducks is in place on the prairies. In situations where abundant wetland breeding and brood-rearing habitat exists and where upland cover is the primary limiting factor, such techniques can be cost-effective. In the Columbia Wetlands, however, there is an abundance of good nesting habitat within the wetlands (before flooding), on the river levees, and in adjacent upland fields and idle land, such that the ducks have many potential nest sites to choose from and would not likely be attracted in significant numbers to habitat managed specifically for that purpose.

Biodiversity Corridors: Movement corridors across the Trench between the major mountain ranges for ungulates and predators was considered a priority in the regional land use plan (CORE 1994, Hamilton and Utzig 1995). Two cross-valley corridors have been included in the WMA, at Fairmont (Lot 112) and at Dry Gulch, south of Radium Hot Springs. These areas will be managed to maintain them in a natural state, to maintain their value as movement corridors and to maintain winter range values for bighorn sheep and other ungulates. Public access by vehicle will be controlled under the 10 HP regulation or other regulations. A habitat management plan should be developed for this part of the WMA, as part of a habitat plan for the Radium Hot Springs/Stoddart Creek sheep herd. Forest ingrowth is a major problem in this area and enhancement burns, thinning and logging will be considered on these sites.

5.4.12 HABITAT MANAGEMENT FOR GENERALIST SPECIES

Several wildlife species use a variety of habitat types over the year or during migration. These include turkey vulture, hawks, falcons, bears and ungulates. There are no obvious habitat enhancement options for these species, except to maintain ecosystem quality.

5.5 WILDLIFE MANAGEMENT

The management of wildlife populations in the wetlands is a shared responsibility between Environment Canada (Canadian Wildlife Service) for migratory birds and the provincial Ministry of Environment Lands and Parks (Fish, Wildlife and Habitat Program) for other wildlife.

5.5.1 WATERFOWL HARVEST MANAGEMENT

Waterfowl harvest strategies are developed co-operatively between the CWS and the Wildlife Program of MELP. The objective of this management plan will be to maintain waterfowl populations and waterfowl hunting opportunities in the WMA, subject to the goals and guiding principles. Seasons and harvests have been stable for many years and little change is expected. Some concern was expressed by the farming community that the goose season has been shortened. It now begins on September 10 (primarily to harmonise with other season openings). Until two years ago, it opened September 1. Returning to the earlier opening date would assist farmers in reducing the impact of geese

grazing on their fields at that time of year. Canada Goose populations may be stabilised or reduced, to reduce their impact on blue heron nesting success.

The Canadian Wildlife Service will continue to monitor nesting success and fall migrant numbers, dependent on funding availability and will share that information with the Wildlife Section.

At present there are no program in B.C. to provide mitigation or compensation for farmers impacted by wildlife use of their lands. Wildlife damage by waterfowl in this area is not a major concern at present.

5.5.2 OTHER MIGRATORY BIRD MANAGEMENT

As a result of concern over continent wide declines in neotropical migrants, the CWS and the US Fish and Wildlife Service are establishing a network of long term monitoring stations. The program has three sites in B.C., at Vaseux Lake, Rocky Point (near Victoria) and at Mackenzie. These sites are run by volunteers with direction for the CWS. The objective is to provide continent wide data to determine the importance of riparian areas to migrants and compare the importance of different sites and habitat types. It will also look at feeding and cover elements important for riparian management. Establishing a site in the WMA should be considered.

5.5.3 MANAGEMENT OF LARGE MAMMAL HARVEST

Responsibility for the management of large mammals lies with MELP. No seasons or harvests specific to the WMA are planned. Trapping and hunting will be managed through the general regulation setting process.

5.5.4 MANAGEMENT OF SMALL MAMMALS

No specific management prescriptions are planned for small mammals or fur-bearers at this time. Muskrat and beaver populations and harvest should be monitored, given the important role these species play in the wetlands. Some management of beaver populations may be considered, based on the outcome of the cottonwood status report proposed earlier.

5.5.5 RARE AND ENDANGERED SPECIES AND HABITATS

Management activities will be in keeping with MELP's policy regarding the protection of endangered, threatened and sensitive species. Important immediate concerns are the status of leopard frog and the need to maintain large diameter cottonwoods in forests along the wetlands for cavity nesting birds. Leopard frogs may be re-introduced to the wetlands, depending on the outcome of studies of this species at Creston.

In a WMA, MELP will assume responsibility for rare plants. An inventory to identify plants of concern in all the vegetation types found in the wetlands should be carried out. Milkweed sites which are critical habitat for Monarch butterfly, should be identified as part of this survey.

5.5.6 MANAGEMENT OF EXOTICS

The introduced species of most concern for the Columbia Wetlands is purple loosestrife. This wetland invader, introduced from Eurasia, has been spreading through mid-latitude North America since late in the last century. Natural biological control mechanisms were not imported with the plant and its spread has become rampant. Only recently have a few such control agents been released in Canada and effective control is still a long way off. One plant was found along the highway at Moberly Marsh in 1997, and was pulled (Paul Goodkey, weed specialist for the Shuswap-Columbia Regional District, pers. comm.). If purple loosestrife became established in the CWWMA, it could have devastating effects on the native flora and fauna. Knapweed and leafy spurge (in Stoddart Creek) are also a concern in drier areas of the WMA.

Exotics will be eliminated or controlled. Biological controls will be used where they are effective. Herbicides will be considered in the benchland portions of the WMA, where a present control program for leafy spurge is underway, but not in the wetland portion of the WMA.

5.5.7 FISHERIES MANAGEMENT

Fishing seasons and bag limits are determined by MELP. The Upper Columbia River is exempt from the general winter/spring closure and provides angling opportunities for whitefish, bull trout, burbot and rainbow trout. Most angling occurs at the confluence of the mainstem Columbia and its' tributary streams.

Large-mouthed bass were introduced illegally into the wetlands in the 1970's. The issue concerning the maintenance of bass in the wetlands is addressed by Griffith 1994 and 1994a. These reports looked at potential bass habitat from Invermere to Golden. They found large-mouthed bass only in Windermere Lake. Although bass were found in five ponds in the wetlands in the last two decades, these populations appear to have died out. Their work indicates that the wetlands are not deep enough and thus do not maintain oxygen levels sufficient for over-wintering. Also, the average summer water temperatures were marginal for bass. Based on these data and the concern that bass are an introduced species that may affect natural fish populations in the wetlands, no future introductions of bass will be considered.

A project to monitor non sport fish populations has been described in the habitat section.

5.6 THE MANAGEMENT OF HUMAN ACTIVITY

The management of human activity will be based on the vision, goals and principles articulated in this management plan. In the next five years, activities will be regulated as described below.

5.6.1 BOATING ACCESS AND ACTIVITY

A regulation was put in place in September 1997 that limited access to the wetlands to “motorized conveyances of less than ten horsepower”. This issue was a major concern during the period in which this management plan was being developed. The jurisdictional issue between the federal and provincial governments concerning the management of boating activity on a navigable waterway has been resolved and the regulation will remain in place. Regulation of motorized activity was supported by the majority of the people we talked to, after the reasons for the regulation and the limitations of other management options were explained. Public comment on this issue is included in Appendix I.

5.6.2 HUNTING

Hunting will continue in the wetlands with the exception of those places closed to hunting under other regulations. Hunting on adjacent federal lands (CNWA) will remain under the control of CWS through the Canada Wildlife Act. The present level of hunting activity is quite low. Need for further controls or season changes are unlikely in the near future.

5.6.3 WILDLIFE VIEWING

Wildlife viewing is and will remain a major use in the WMA. If this activity increases in the future, use will be managed consistent with the guiding principles and goals. The major concern is the potential impact on species nesting and roosting along the river channel. Any proposals for structures to facilitate wildlife viewing (viewing towers, boardwalks) will be considered on a case by case basis.

5.6.4 TRAPPING AND OUTFITTING

Except for several small areas, the Columbia Wetlands are allocated to existing traplines. Trapping will continue in the WMA. The current "open" areas will not be reallocated. In the event of a forfeiture of an existing line, a decision on reallocation would be made based on the guiding principles and management concerns at that time. Problem animals in areas outside established traplines will be trapped by permit where necessary. Based on an assessment of the status of cottonwoods in the wetlands, there may be some requirement to manage beaver populations.

Portions of the WMA are part of several guiding territories. That use will continue subject to all regulations. Those areas not presently part of a guiding territory will not be reallocated and further expansion of guide territories within the Columbia Wetlands WMA will not be considered.

5.6.5 COMMERCIAL RECREATION

The present level of commercial wildlife viewing use is low, however the numbers of unlicensed operators has increased substantially in recent years, especially in the Golden area. Commercial operations in the WMA will be managed according to the following principles.

- Only those operations that are based on wildlife viewing or other wildlife related activity will be considered. Snowmobile tours for example, would not be allowed. Non intrusive activities such as ski-touring would be considered, subject to the goals and guiding principles expressed in this plan.
- When new operations are proposed, the onus will be on the proponent to demonstrate that the operation will have “a positive or neutral impact on wildlife values” in the WMA and will comply with the goals and guiding principles of the WMA.
- A process for licensing operators and vetting proposals for commercial activities is in place for the province. The Commercial Backcountry Recreation Policy (CBR) will apply in the WMA. Proposals received by BC Lands will be referred to the Wildlife Program of the Ministry of Environment, Lands and Parks. If the proposal is in agreement with the goals and principles of the WMA, the proposal will then proceed through the regular CBR process, including comment from interest groups and the public.

5.5.6 OTHER RECREATION USE

Canoe races and other activities not related to the enjoyment of wildlife recreation will not be considered. Special permits may be considered for some activities if they meet the goals and guiding principles of the plan.

5.6.7 AGRICULTURE

Grazing by cattle will continue on the permitted areas, subject to range use plans and established grazing rotation plans, but will not be considered in other areas. Enhancement burns and fencing proposals will be considered on a case by case basis. Other activities (landfill, dyking, cultivation) will not be considered in the WMA, although they may occur on adjacent private land in the wetlands.

5.6.8 FOREST HARVEST

Logging, on appropriate sites, is an permitted use in Wildlife Management Areas, subject to the goals and principles of this management plan.. However, productive conifer forests are a minor component of the WMA. Jamieson and Ohanjanian 1993 provide estimates of the total volume of timber in the WMA. Regulations under the Forest Practises Code would severely limit logging options in much of this area due to constraints now required for logging in riparian areas.

5.6.9 WATER RESOURCES

All facilities for water level management or the use of water from the wetlands, the Columbia River or its tributaries will be licensed under the standard procedures in MELP and will be subject to the goals and guiding principles of this management plan.

5.6.10 MINING AND PETROLEUM AND NATURAL GAS LEASES

No active mining ventures exist in the WMA. The potential for mining under the deep silt overburden found below the wetlands, and the problems associated with water flows through the area would make mining extremely difficult in this area. There are no petroleum or natural gas leases in the proposed Wildlife Management Area.

5.6.11 LAND ALIENATION

Land alienations within the wetland system will not be entertained except where very small alienations can be shown to improve the viability of contiguous and developed private land while maintaining or improving wildlife values in the WMA, or where small area leases are required to develop the infrastructure for wildlife viewing sites. In these cases, alienations will be subject to the goals and guiding principles of this plan.

5.6.12 OTHER

Demand for land uses other than those already described are not anticipated at this time. Further alienations for the construction of additional roadways across the wetlands will not be considered, as provided in the “wetlands agreement” developed during the CORE process.

If programs for mosquito control are proposed in the future, they will be dealt with on a case by case basis. Control using BTI (Vectobac) will be preferred to the use of more noxious chemicals.

5.7 RESEARCH, MONITORING AND EDUCATIONAL ACTIVITIES

5.7.1 RESEARCH

Research on all aspects of the Columbia wetlands system will be supported, especially research which addresses habitat and wildlife management issues relevant to the WMA. The area will provide an excellent field site for university students and researchers and their participation will be encouraged. Those research projects that address the problems identified in this management plan will be given assistance, where possible. Some concern was expressed by local people about projects that would involve the collaring of large numbers of animals, as they perceive is happening in the National Parks. Researchers working in the wetlands will be directed to consider this issue and to consider non-intrusive methods of monitoring and research. All research projects will be subject to the goals and guiding principles of this plan.

5.7.2 POPULATION AND HABITAT MONITORING

A habitat and population monitoring program will be conducted to identify subtle alterations in habitat condition and wildlife population status as identified in this management plan.

5.7.3 MONITORING OF HUMAN USE

In order to manage human use and its impacts in the WMA, some means of monitoring human use, primarily recreational and commercial use, should be developed. Records are available on the “person days” of use provided by commercial operators, however there are no tools at present for monitoring non-commercial recreational use. This may not be a concern in this first five year plan but should be considered in subsequent plans.

5.7.4 EDUCATIONAL ACTIVITIES

Education on the values of wetlands should be an important part of use of the wetlands. A visitor centre has been proposed and will be supported. School education programs should be encouraged. Proposals for educational activities will be considered on a case by case basis, subject to the guiding principles. School education programs should be encouraged. Proposals for educational activities will considered on a case by case basis.

5.8 ADMINISTRATIVE ISSUES

There are several issues concerning the administration of the WMA in relation to the management of lands adjacent to the WMA by other agencies.

5.8.1 RELATIONSHIP TO ADJACENT PARK LANDS

There are several small provincial parks and park reserves located in or adjacent to the marshes. These are:

Spillimacheen Provincial Park Reserve: This is a block of Crown land at the mouth of the Spillimacheen River that has been a park reserve for some time, however, no park development has taken place and none is anticipated. The wetland portion of the park reserve has been included in the WMA.

Burges and James Gadsden Provincial Park: This area was donated to the province in 1964. The park provides protection for 352 ha of marsh and riparian habitat, part of which has been developed for waterfowl by Ducks Unlimited. There is no road access to the park and no facilities; few options exist for developing such facilities without the purchase of private lands between the park and the highway (Anon. 1987). These lands have not been included within the WMA.

5.8.2 RELATIONSHIP TO ADJACENT LANDS MANAGED BY THE

CANADIAN WILDLIFE SERVICE

There are four parcels of land (the Columbia National Wildlife Area) within the wetlands that are managed by the CWS. The management of the CNWA will continue to be governed by the federal Wildlife Area Regulations under the Canada Wildlife Act. There are specific regulations that apply to the federal lands that are more restrictive than those applying provincial crown or private lands. Activities such as hunting, trapping, commercial activities or specific public use that may be allowed on provincial crown land may not be permitted on the federal lands. Many wildlife values, however, will be managed in concert with the WMA as the objectives of both management plans are similar.

5.8.3 RELATIONSHIP TO PROVINCIAL WILDLIFE PROPERTIES.

RCMP Flats: The Nature Trust of B.C. owns 236 hectares of wetland near the town of Edgewater. These lands are leased to the Fish and Wildlife Branch. No enhancement activity has taken place. These lands have been included within the WMA.

Bergenhams Wildlife Sanctuary: A small portion of this property is part of the Moberly Marsh (12 ha); the remainder (187.6 ha) is associated forested benchland north of Golden. The wetland portion of this sanctuary will be managed in concert with the remainder of the WMA. The benchland portion of the sanctuary east of the highway is presently managed by the Wildlife Branch in co-operation with the Golden Rod and Gun Club (as a wood lot) and that relationship will continue. The present no shooting zone will be maintained. These lands have been included within the WMA.

5.8.4 RELATIONSHIP TO CANADIAN PACIFIC RAILWAY LANDS

The CPR railway is the major industrial intrusion in the wetlands, running the entire length of the wetlands, on the west side from Fairmont to Invermere, crossing the wetlands below Athalmer and running along the east side to Donald. Many concerns were raised during the public meetings concerning the impact of the railway on the wetlands. Dumping of garbage and pollutants into the wetlands, the impact of coal dust, side-casting into the wetlands where the right-of-way has been expanded and weed control issues were all mentioned. Contact should be made with CPR to discuss these concerns and develop a long term relationship with the company to deal with these issues. Plans should be developed to deal with a major train derailment that could potentially dump large volumes of coal and possibly other industrial commodities into the wetlands. During December 1997, the entire volume of shipments east and west was using this route since the "circle" tunnel at Field was closed. A wide variety of industrial chemicals were probably being transported along this route during that time.

5.8.5 RELATIONSHIP TO HERITAGE RIVERS PROGRAM

The Columbia River has been proposed for provincial heritage river status. If that status is given to the river, it will provide recognition of the importance of the river but does not confer further protection or imply specific management. No changes in the management

plan are expected as a result of this designation, if it occurs.

5.8.6 DESIGNATION AS A RAMSAR SITE

Local interest groups have expressed an interest in pursuing RAMSAR designation to identify the international importance of this wetland.

5.8.7 MANAGEMENT AGREEMENTS BETWEEN AGENCIES

In the long term, management agreements dealing with issues of common concern may be required with a variety of government agencies and industrial concerns. These will evolve over the next five years and should be considered in detail in the second five year plan.

5.8.8 ENFORCEMENT POLICY

Enforcement of the Wildlife Act and regulations within the WMA is the responsibility of the Conservation Officer Service within MELP. Enforcement of the Water and Land Acts, etc., will be carried out by the appropriate agencies. Regulation enforcement for the federal lands in the wetlands is the responsibility of Environment Canada.

5.8.9 RESPONSE TO MAJOR FLOOD EVENTS

Concerns were raised at the public meetings concerning the impact the WMA would have on the ability of communities to respond to major flood events. This issue is of primary concern at Athalmer and Golden, although issues may arise at other communities along the wetlands.

The manager of the WMA will work with communities to develop contingency plans that will allow for immediate actions within the WMA in emergency situations, as provided under the Provincial Emergency Program.

5.8.10 BOUNDARY CONCERNS

Appendix III. provides 1:100,000 scale maps of the WMA. The proposed WMA is indicated in light green. Federal lands managed by the Canadian Wildlife Service are indicated in pink, provincial and national parks are in dark green, crown lands under lease are red and lands managed by the Wildlife Branch are indicated in orange. There are several areas where minor boundary issues have been resolved; these are discussed in Appendix IV. A folio of 1:20,000 scale maps are available at the MELP office in Cranbrook.

5.8.11 FUTURE PUBLIC INVOLVEMENT IN THE MANAGEMENT OF THE WMA.

The public, stakeholders and government agencies will be consulted if major management actions are required beyond those outlined in this plan. The concept of “river keepers” or other means to involve local people in the ongoing management and protection of the wetlands will be explored. Consideration will be given to creating a public advisory group to provide input into the management of the area, perhaps in concert with the similar group (the Columbia Wildlife Area Management Advisory Committee) in place for the federal National Wildlife Area.

5.8.12 FUTURE FIRST NATIONS INVOLVEMENT IN THE MANAGEMENT OF THE WMA.

The Land and Resource Management section of the K’tunaxa Tribal Council was consulted during the development of this management plan. MELP and First Nations communities have common concerns in the wetlands in at least three areas.

There are possible research and inventory projects which could be undertaken jointly. Numerous recorded and unrecorded archaeological sites exist in the Columbia Valley Wetlands WMA, which have not been monitored for impact of erosion, ‘pot hunting’ of artifacts and other degradation, since the sites were surveyed in the 1970’s. These sites should be re-located and records made of their condition. Similarly, information has been and will be gathered by the Ktunaxa Kinbasket Tribal Council regarding the traditional use sites within the WMA. These sites should be documented. The protection of these archaeological and traditional use sites is of particular concern to First Nations and will be addressed in the immediate future.

The concept of “joint stewardship” and “joint management” will be investigated with First Nations. These are complex issues, however the wetlands provide a good opportunity to explore the opportunities and issues inherent in these concepts.

The Columbia Lake and Shuswap Bands have Indian Reserve lands adjacent to the Columbia Wetlands WMA. These two Band Councils and the Tribal Councils will be involved in the discussion of management issues which may affect these lands.

5.8.13 LONG TERM FUNDING FOR THE MANAGEMENT OF THE WMA

The WMA is a large area and is a major responsibility for the Wildlife Program. Since there are also other government agency responsibilities in the wetlands, the option exists for developing a co-operative funding strategy between the Wildlife Program, BC Lands and the Canadian Wildlife Service.

Funding for specific habitat monitoring and enhancement projects will be pursued with several funding agencies including:

Columbia Basin Fish and Wildlife Compensation Program
Habitat Conservation Trust Fund of BC
Columbia Basin Trust
The Phase 4 Resource Inventory Program as part of Treaty Process
Wildlife Habitat Canada
Forest Renewal BC
Ducks Unlimited, the Elk Foundation and other private conservation organisations
Friends of the Columbia Wetlands
Columbia Basin Trust

6. PROVISIONS FOR REVIEW

The management plan will be reviewed in five years, in 2002, then every ten years following, subject to major management issues arising in the intervening years.

7. CONCLUSIONS

This management plan was developed with the assistance of a large number of people in the Columbia Valley that were very concerned with the future of the wetlands. While the plan that has evolved differs somewhat in direction from other Wildlife Management Areas in the province (where more active management is practised), this plan reflects the desire of people in the area to maintain and protect a very important natural ecosystem where wildness and natural processes prevail. The Ministry will continue to work with the people of the Upper Columbia Basin to ensure that this natural treasure is maintained in perpetuity.

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9.0 APPENDICES

APPENDIX I. PUBLIC INPUT TO THE DEVELOPMENT OF THE MANAGEMENT PLAN

APPENDIX II. A REVIEW OF RARE AND ENDANGERED SPECIES

APPENDIX III. MAPS OF WMA BOUNDARY (1:100,000 scale)

APPENDIX IV. BOUNDARY DESCRIPTION*

APPENDIX V. FIVE YEAR WORK PLAN*

*** Separate appendices available at the MELP office in Cranbrook, B.C.**

APPENDIX I. PUBLIC INPUT TO THE DEVELOPMENT OF THE MANAGEMENT PLAN

This appendix includes:

- The letter to participants in the public process.
- Copy of Comment Sheet.

Further information is the public comments received is available on file at the Wildlife Branch in Cranbrook, including:

- A record of the Public Meetings (notes recorded by Ed Hennan).
- Record of other meetings held.

LETTER TO PARTICIPANTS

The following letter was sent in March 1998 to all those who participated in the public meetings and consultative process to describe what we heard from people. It provides an overview of the comments received during the public consultation.

Dear Participant;

RE: ASSESSMENT OF COMMENTS RECEIVED DURING THE PUBLIC INPUT PROCESS FOR THE DEVELOPMENT OF A MANAGEMENT PLAN FOR THE COLUMBIA WETLANDS WILDLIFE MANAGEMENT AREA.

This letter is being sent to everyone who attended the public meetings and left an address on a meeting attendance list. The purpose is to describe what we heard and give all those involved some understanding of the discussion that went on at meetings that they may not have attended.

Three public meetings were held at Invermere, Golden and Brisco in November, 1997 concerning the management of the Columbia Wetlands WMA. About 40 people attended the Invermere and Brisco meeting and about 115 people were in attendance at Golden. We also met with individuals and groups from September through January.

Discussions at the meetings were dominated by the horse power regulation issue. Other management issues played a larger role in the discussions held with groups before and after the public meetings.

Vision and Goals for the WMA

- The vision and goals statements provided for discussion were supported by the vast majority of those who returned the comment sheets from the meetings. A further goal concerning the maintenance of viewscapes along the wetlands was included based on comments received from several people.
- There was unanimous agreement that maintaining wildlife values was the major goal in the WMA.
- Almost everyone we consulted wanted to see the wetlands remain in a natural state. Several individuals and groups made the point that the Upper Columbia River is one of the few remaining natural waterways remaining in the Columbia Basin. (Wetland and riparian cottonwood habitats are severely restricted in the Columbia Basin as the result of dam construction and other human activities).
- Most people consulted were emphatic that major earth moving activities, such as the dyking and water control projects should not occur here. In general, the Columbia wetlands do not lend themselves to a high level of habitat enhancement. Rather, the

objective will be to maintain the present habitat values and allow natural processes to maintain and at times, alter these natural habitats. People felt that managers should adopt a “hands-off” approach to managing the area.

- There was unanimous agreement that the wildlife and “wildness” of the WMA must be protected. Notwithstanding the kind of vehicle people prefer to use, everyone who used the wetlands did so because they enjoyed the wildlife, natural scenery and solitude they found there.
- The primary human use in the WMA should be those activities related to enjoying wildlife and natural landscapes.
- From our discussions with people who use the wetlands it is obvious that one of the major attractions is the opportunity to get away from human dominated landscapes and into a natural, quiet landscape. The majority of people we talked to appreciate the uncrowded, high quality wildlife viewing opportunities and recreational experiences that the wetlands provide.
- Many people suggested that we should maintain the aesthetic quality of views of the wetlands, especially from communities, homes and from viewpoints along Highway 93 on the east side of the wetlands.
- Many people felt that any activity that occurs in the WMA should have a neutral or positive effect on wildlife and fisheries values. They saw this as a "litmus test" for deciding what kinds of activities should occur in the wetlands.
- Existing uses, as described in the "East Kootenay Table Columbia River Marshlands Agreement" should continue in the WMA. This agreement, developed at the East Kootenay Negotiating Table (CORE 1995), was signed by all of the participants. According to that agreement, the primary objective of the WMA should be to maintain wildlife habitat values and allow for the continuance of existing uses (hunting, fishing, wildlife viewing, camping and hiking) that have occurred for many years in the wetlands. Trapping and the use by two commercial rafting and canoeing operations were also recognised as existing uses of the area.

Planning Process

- The process used in establishing the order for a 10 hp limit was considered by many people to be non-consultative. Many people felt insulted by the way in which this restriction was imposed. This strong reaction to this regulation is the result of a sense of being over-regulated in general and especially concerning hunting and fishing regulations; and a sense of a lack of consultation on a variety of resource issues that has affected residents of this area.

Recreational and Tourism Use

- There was disagreement about projections of levels of recreational use of the WMA over the long term. Some felt that growth would be “explosive”; some felt that such projections were exaggerated.
- There is little question that the WMA can and should be used to provide recreational opportunities; it’s a matter of what types of activities are acceptable and to what level of intensity.
- There was some support for the idea of self-regulation of recreational activities; i.e. the users would police themselves and use educational materials to promote appropriate behaviour.
- There was some concern with public access. There are only a few developed access points in the wetlands.

Other Uses

- The management of activities on the CPR rail line was a concern for many people. Chemical pollution, cut-and-fill practices, coal dust, noise, the destruction of wildlife by collisions on the tracks and weed control were all mentioned.
- A question was raised concerning how WMA status would affect options for communities to respond to flood events, especially at Golden.
- Concern was expressed concerning water quality and how that would affect the wetlands.

10 HP issue

Based on the letters written and the responses to the comments sheets we have received so far, we think it is fair to say the following:

- The question of who has jurisdiction (federal vs provincial) for the management of boating on the Columbia River was raised at all meetings.
- The majority of responses have been in favour of the 10 HP restriction. We have no way of knowing how directly this reflects the feeling of the entire community, since a campaign has been mounted from both sides to generate letters. Almost all of the letters supporting the regulation were individually written letters while most of the letters opposed to the regulation were faxes or copies of the same form letter. It is obvious from the letters and from all the people we have talked to that everyone involved cares very passionately about the wetlands.
- There was disagreement about whether or not motor boats and other motorized conveyances disturb or would disturb wildlife. Some felt that canoes and cross-country skiers had as much or more impact.
- There seemed to be universal opposition to the use of jet-skis in the wetlands. Very few people supported their use in the river channel.
- Some people felt that the trains running up and down the valley are a greater disturbance to wildlife than current levels of boating.
- The issue of prop wash and wake from larger boats affecting river banks and creating a safety hazard for small craft was brought up by several people.
- Several people indicated that community support for any regulation is very important if it is to be effective.
- The point was made by several people that options for boating for people in Golden are limited. The Mica reservoir is cold and full of debris and dangerous to boat in. Many smaller local lakes have HP regulations in place or are very small.
- Some people suggested that there would be a large compliance problem with present regulation, unless it had widespread community support.
- One of the positive aspects of the 10 HP regulation is that it is easily enforceable. Several people pointed out that a speed limit on the river would be very difficult to enforce with the present level of enforcement staff available to either the Conservation Officer Service, the RCMP or the Coast Guard.

Commercial use

- There was general support for wildlife based tourism operations in the WMA, if

managed appropriately and carefully regulated.

- There were a variety of suggestions on how best to license such operations. Some suggested tenures limited to specific parts of the river, other suggested annual permits rather than longer term tenures.

Public Involvement

- Several people suggested that there should be a “Friends of the Columbia Wetlands” group established. Others suggested that a committee involving local people should be established to assist in managing the wetlands. The idea of “river keepers” was suggested by others.

First Nations Involvement

The K’tunaxa Tribal Council and the Shuswap and Kootenay bands expressed a variety of concerns related to their long standing traditional uses in the wetlands. They are concerned about the destruction of native use sites along the Columbia River and the possible impact of WMA status on their options for exercising their traditional rights in the area.

COMMENT SHEETS

Comment sheets were provided at the meetings. Below is an assessment of the balance of opinion on the the major issues as indicated by the comment sheets returned. Thirty one comment sheets were received. Many people commented on only some sections and points, thus the disparity in numbers.

- The vision statement was supported by 16 people and opposed by none.
- Twelve people wanted to retain the wild character of the area and one was opposed.
- Thirteen people wanted to allow natural forces to continue to act in the wetlands (except where it would affect private land), one was opposed.
- Fifteen people supported tourism operations in the wetlands, if they were carefully regulated and directed at the appreciation of natural values, four we opposed.
- Six people supported wildlife and fisheries enhancement in the wetlands and fifteen were opposed. In most cases enhancement was supported only to prevent the disappearance of species or for dealing with specific, defined concerns.
- Nineteen people supported the 10 horse power restriction and ten we opposed.

A variety of other issues were addressed at the meetings that could not be included here. We have considered all input and where possible, have incorporated those ideas and concerns in the management plan.

Thank you for participating in this process and helping us to develop this plan.

Dave Phelps
Ministry of Environment, Lands and Parks

Bob Jamieson
BioQuest International Consulting Ltd.

Ed Hennan
Legacy Wildlife Consulting

This comment sheet were provided to those who attended the public meetings and were the basis for discussion with groups we met with after Nov. 15.

COMMENT SHEET

A VISION, GOALS AND APPROACH TO PUBLIC INPUT FOR THE COLUMBIA WETLANDS WILDLIFE MANAGEMENT AREA

VISION

- The Columbia River Wetlands will remain a complex floodplain ecosystem with a substantially unchanged biological community predominantly governed by natural ecological processes.

Revisions/other ideas:

GOALS

PRIMARY GOAL

- To manage and maintain wildlife habitat in the Columbia wetlands to ensure abundant, diverse and self-sustaining populations of fish and wildlife species.

Revisions/other ideas:

Goals for Wildlife Management

- To maintain and enhance populations and habitats of wildlife species that occur within the WMA, and to attain optimum population levels within available habitats. (The emphasis of habitat management will be equally allocated to migratory waterfowl, ungulates, endangered species and other wildlife. Management prescriptions will ensure that the habitat needs of all plant and animal species are accommodated).
- To enhance habitats for wildlife where such projects will have minor impacts on the landscape. The balance of the area will be protected and managed via a “leave alone” policy where natural processes will be allowed full rein. Habitat enhancement projects will complement the existing dynamic natural processes.

Revisions/other ideas:

Goal for Recreation and Use

- To provide opportunities for the public to appreciate, study, and view wildlife in

their natural habitats. (This would be the primary human use in the WMA).

- To maintain a sense of wildness and solitude in the WMA, and to encourage only those uses that maintain that sense of wildness.
- To accommodate other resource uses that are compatible with and compliment the primary objectives of the WMA.
- To maintain a high quality natural experience for those using the wetlands, as measured in terms of wildlife viewing options, quality recreational experience and a low level of other visitors and other human activity seen or heard.

Revisions/other ideas:

Approach to Public Involvement

- The public, stakeholders and government agencies will be consulted on an ongoing basis concerning all major management actions taken in the WMA. The management plan will be reviewed every 10 years.
- The WMA manager will actively include affected First Nation communities in the public process that will help to define management actions in the WMA. Subject to wildlife conservation concerns, First Nations interests will be accommodated within the Management Plan. Designation and management of WMAs is without prejudice to future land claim settlements.

Revisions/other ideas:

MANAGEMENT ISSUES

The role of dynamic natural processes in the WMA.

The Columbia Wetlands are a dynamic natural system that are changing continuously as a result of natural erosion, flood episodes, fire, beaver impacts on cottonwood stands and other natural processes.

How should managers respond to major natural events that may compromise wildlife and scenic values in the wetlands?

Type and extent of enhancement activities to take place

Some wildlife enhancement activities (dyking, water control structures), if developed, could have a significant impact on the landscape and aesthetic values.

Projects being considered to date are:

Baseline surveys of fish populations in the Columbia River and the wetlands, including coarse fish used by ospreys, mergansers, otters and other fish-eating wildlife species.

Dyked wetlands to stable water levels for nesting waterfowl and species of concern such as sandhill cranes and canvasback ducks.

Nesting platforms for geese and other species

A survey of use by cavity nesting birds of presently available cavities (primarily in cottonwood trees).

A survey of songbirds using the wetlands for nesting and during migration.

Further work on the status of cottonwoods stands in the wetlands.

Enhancement of some sites for ungulates and songbirds by maintaining a mix of forest, shrub areas and grassland openings in areas where major side tributaries come into the wetlands.

A survey of bird and mammal species that use coniferous forest areas adjacent to the wetlands for nesting but feed or otherwise live in the wetlands.

What types of enhancement should take place?

How much enhancement activity do you want to see?

RECREATIONAL USE

Please give us your ideas on what kinds of uses should be given priority in the wetlands.

What uses should not be allowed?

COMMERCIAL USE

How many and what kind of commercial tourism operations should be allowed in the wetlands?

How should they be regulated?

MANAGEMENT OF VEHICLE AND BOAT USE

Which option do you prefer for the regulation of motorized use in the wetlands?

(Circle your most preferred option, indicate others that you might support with a check mark).

- Retain 10 HP reg. (permits for trappers for larger motors, other specific uses)
- Increase horsepower of vehicles and boats allowed.
- Remove HP regulation completely
- Remove regulation, impose a 10 HP regulation in 5-10 years if use increases.
- Limit use and motor size during specific periods and seasons.
- Remove high recreational use areas from the WMA - eg. Milligan Lake
- Provide special areas within WMA for higher impact recreational use
- Manage for downstream boat use primarily
- Limit commercial tourism use to specific portions of the wetlands.
- Limit the number of commercial operators on each section of the river.
- Limit snowmobile use to specific areas.
- Impose no regulations on snowmobile use

Do you have any other ideas on this issue?

Fiscal strategy

Do you have any ideas for financing the maintenance and management of the WMA?

Please leave this sheet at the door, or send to:

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APPENDIX II. DATA ON RED AND BLUE LISTED SPECIES IN THE COLUMBIA WETLANDS WMA.

Below is a description of the species listed for the Invermere and Golden Forest Districts that may occur in the WMA.

Two species are ranked as S1 or critically imperiled in B.C. (BC Conservation Data Centre 1998).

Leopard Frog: The leopard frog is the amphibian of primary concern in this area. It was known to occur in the mid- 1970's in the Columbia Marshes (I. Jack, L. Halverson, pers. comm.). A National Museum of Canada research team documented their occurrence at Edgewater and Moberley (Scheuler et al. 1980). Shortly after this time, a range-wide decline led to the extinction of this species throughout much of its western range in North America (Bishop and Pettit 1991). Surveys of the Columbia Marshes in 1995 and 1996 revealed no northern leopard frogs, and at present they are known to occur only in the Creston Valley. (Ohanjanian 1997) and near Eureka, Montana.

Management of the WMA should take into consideration options for re-introducing and maintaining this species in the wetlands, especially as their numbers appear to be recovering in other areas of their range.

White Sturgeon: The Columbia River population of this species is listed for the Golden Forest District. A few individuals may survive in the Columbia River and Kinbasket Reservoir, however there is no evidence of their presence in recent years.

Two species are ranked as imperiled (S2) for the two Forest Districts , but there is not evidence that they nest in the WMA.

Prairie Falcon: Sightings in the Rocky Mountain Trench indicate that the birds could nest in the East Kootenay, however, no nest has been verified.

Short-eared Owl: This species is a fall migrant through the wetlands but there is no evidence of nesting, although it is suspected that it does nest in the wetlands (R. Ferguson, pers. comm). It was observed in the spring of 1997 at Moberly Marsh (E. Zimmerman, pers. comm.). At Creston this species used grassland areas adjacent to the wetlands in the CVWMA for nesting but has disappeared in recent years (B. Shushnoff, pers. comm.).

This species should be of management concern in the Columbia wetlands.

There are several species that are listed as vulnerable (S3) in the Invermere and Golden Forest Districts. Of these species, only one (bull trout), is considered vulnerable (G3) globally. Those species which are known to occur in the WMA are listed below.

LARGE MAMMALS

Grizzly bear: Grizzly bears are seen only occasionally in the wetlands although tracks were seen by T. Munson in Sept. 97 and by D. Hendron in Oct. 97 in the wetlands near Brisco. It is very likely that bears were much more common in the wetlands in earlier times when there were salmon spawning in the river. Corridors across the wetlands and the Trench are a concern.

Badger: The Yellow Badger has been identified as being of concern in the East Kootenay Trench. A study is presently underway, looking at their status in the region (N. Newhouse, pers. comm.). This is a grassland dependent species and occurs in the bench land portions of the WMA.

Rocky Mountain Bighorn Sheep: Bighorn sheep utilize the upland bench areas included in the WMA in the Radium Hot Springs area. Part of the role of WMA status for that area is to maintain habitat for this species.

BIRDS

Great Blue Heron: Great Blue Herons are relatively common in the East Kootenay Trench and in the Columbia wetlands. There are several known rookies in the wetlands.

Sandhill Crane: Sandhill cranes are seen irregularly during migration in the wetlands but do not appear to nest in the wetlands. One pair of Sandhill Cranes (probably Greater Sandhill) has nested for several years on Bummer's Flats (Cooper 1996). Consideration might be given to establishing sandhill crane nesting areas in the wetlands. Sandhill cranes nest on floating platforms made of vegetative material and would probably require areas with stable water levels for nesting.

Bittern: The Bittern uses wetland areas with dense emergent vegetation or tall grasses (Campbell et al. 1990) and they are victims of the continuing loss of wetlands. They are declining throughout the continent and are on the U.S. Blue List (Tate 1986). They are uncommon but have been observed in the wetlands in several areas (L. Halverson, pers. comm.). likely breeders

Turkey Vulture: Turkey Vultures occur in the E.K. Trench although this is close to the northern extent of their range. Turkey vultures have been observed in all seasons except during the winter months (Campbell et al. 1990). Breeding habitat is usually in crevices on precipitous cliffs. Populations appear to be declining in western North America (Tate and Tate 1982); vultures are susceptible to eggshell thinning and loss of nesting habitat (Anon. 1991). In B.C., populations appear to be stable, however, this is uncertain as data on their numbers is limited. Vultures are seen irregularly during the summer.

Flammulated Owl: Flammulated owls are known only from Premier Ridge (observed by Rick Howie), the east side of Columbia Lake and Stoddart Creek (Leung and Simpson 1994) and at Newgate (S. Canning, June 1996). This species uses older age Douglas-fir vets in relatively open habitats where it can hunt invertebrates, primarily grasshoppers and moths (Hayward and Verner 1994). Habitat for this species (older age Douglas-fir stands) may occur in some areas adjacent to the wetlands.

Swainson's Hawk: This species migrates through the wetlands but does not appear to nest in this area. It is seen occasionally in the wetlands, from May to September (Ferguson and Halverson 1997). One bird was seen May 11, 1997 by L. Halverson.

Bobolink: This species is listed as uncommon by Ferguson and Halverson 1997. This species was seen at Moberly Marsh and at Parson in June, 1996 (E. Zimmerman, pers. comm.). It uses meadows and adjacent fields.

Bald Eagle: Several pairs nest in the wetlands and adjacent areas. One eagle was observed at Edgewater in the summer of 1997 that was carrying a satellite backpack and beacon that had been captured on the Skagit River in Washington (T. Kinley, pers. comm.). Surveys in B.C. and elsewhere indicate that numbers are trending upward and the status of this species is under review (T. Antifeau, pers. comm.). It is currently listed as S4.

Tundra Swan: Swans occur in large numbers as migrants. This species is currently listed as S3N.

REPTILES

Painted Turtle: The Painted turtle has been blue-listed and is a species of significant concern in the E.K. Trench. One relatively large population (700 animals) is located in Kikomun Creek Provincial Park (Macartney and Gregory 1985). They are limited to a relatively low number of pothole lakes and wetlands and are at risk since they nest at some distance from water and often cross roads in the process. This species occurs in the wetlands, but in relatively low numbers compared to some other wetlands further south in the Trench. They are common at Wilmer and at Dorothy Lake in Invermere, but are uncommon further north. A laying female was observed by Susan Stewart at Spillimacheen in the early 1990's.

Rubber Boa: The Rubber Boa is very uncommon. It appears to prefer hot springs, riparian habitat and rocky areas in the East Kootenay Trench. This species is uncommon in most of the East Kootenay Trench, but has been observed in rocky areas adjacent to the Columbia River at Thompson's Landing north of Brisco (I. Jack, pers. comm.). It is often seen at the hot springs at Radium Hot Springs (L. Halverson, pers. comm.).

FISH

Below is a description of the fish species listed for the Invermere and Golden Forest Districts that may occur in the WMA.

Bull trout: Bull trout occur through most of the Columbia River system. There is little data at present on this species in the wetlands. This species is doing well in Kinbasket Reservoir, but it is not known if this population spawn in the Upper Columbia or its tributaries. This is the only species listed provincially that is also considered vulnerable throughout its range (G3) (Anon 1997a).

Chiselmouth: Little data is available on this species. Griffith 1994 sampled fish populations in the wetlands and did not record this species. It has been recorded in Windermere Lake (T. Antifeau, pers. comm.).

Salmon: As many as five species of salmon spawned in the Upper Columbia prior to the construction of the Grand Coulee dam in 1936. Although these runs of salmon are not presently listed, it should be noted that these salmon species have been extirpated for the region and the specific races that used the Upper Columbia as extinct.

The following information on the historic presence of salmon was provided by Larry Halverson and Rod Heitzmann of Parks Canada.

Marius Barbeau (Indian Days on the Western Prairie 1965) did ethnographic work with the Kootenay and Stoney in the 1920s. He wrote " ...the Lake Kootenays, Arcs-a-Plat or Flatbow-- ... seldom crossed the mountains. Like most northwestern tribes, they congregated along the canyons in the summer at a time when the five varieties of salmon ran, in turn, up to the spawning bottoms at the headwaters of the Columbia River, about 1400 miles from the sea coast. Here the greatest activity in the year prevailed: the men watched on their platforms, gaffed or speared the fish or caught them in weirs; and the women split, dried, and smoked them on green willow racks for preservation. Salmon were so plentiful, gathering in such incredible numbers at the spawning grounds near the headwaters, that it was an easy task, particularly for the Upper Kootenays, to replenish their stores. The vertebra of the fish rotted every year in layers so thick as to form "ridges" that even yet have not entirely disappeared at the place named "Salmon Beds", now Athalmer townsite, though for a long time now the annual run of the salmon has dwindled to nothing." (Page 40)

In 1807, David Thompson crossed the Rocky Mountains by way of the Howse Pass and Blaeberry River. He then turned south and established a trading post called Kootenae House near the outlet of Windermere Lake. Thompson and his crew were short on food, but the Kootenay occasionally brought them deer, elk and bear meat. On August 13, the Kootenays advised Thompson to build a fish weir. During the third week in August, the summer run of salmon arrived...Finan McDonald went out at night with a flambeau [torch] and speared salmon weighing up to twenty-six pounds ("tolerable good, but having come so far had lost all their fatness") (Nisbet 1994:97).

By October 26, Thompson's men were working on stockades. "The salmon run was over now, and the shores were littered with dead fish." (Nisbet 1994:105).

Just north of Canal Flats, is the Columbia Lake Site, EbPw 1. It has been test excavated by Mohs in 1980, (Mohs 1981) and by Yip in 1981 (Yip 1982). Mohs did a cursory faunal analysis that classified bone as land mammal, fish, bird or shell. Yip had a more specific analysis undertaken by Helen Lemon who identified some bone as salmon, sucker and peamouth. Fish remains formed 65.6% of the total number recovered (n=7062). It should be pointed out that Yip refers to anadromous fish when talking about salmon, although these might also be trout depending upon size.

PLANT COMMUNITIES

Fifteen plant communities are listed on the Rare Plant Communities Tracking List for the Invermere and Golden Forest Districts (BC Conservation Data Centre 1998). Four of these are communities that are well represented in the wetlands while four others are represented in the dryland portions of the WMA. A list of these communities is attached. A survey of these rare plant communities is proposed as part of this plan.

RARE AND ENDANGERED PLANTS

Forty one species of rare vascular plants are listed for the Invermere District and thirty five for the Golden Forest District (BC Conservation Data Centre 1998). A list of these communities is attached. Many of these species occur in the wetlands and in the dryland portions of the WMA. Information on the distribution of these species and the risks they face is limited (G. Douglas, pers. comm). A survey of rare plants is proposed as part of this plan.

The species listed as S2, S3 or S4 for the Golden and Invermere Forest Districts but that are unlikely to occur in the WMA are listed below.

MAMMALS

Wolverine: Wolverine is generally found at higher elevations. It has not been seen by L. Halverson in the wetlands.

Fisher: Fisher are generally found at higher elevations. An attempt is being made to re-introduce this species in other parts of the region (I. Teske, pers. comm.).

Woodland Caribou: Woodland Caribou occur at higher elevations in the region but not in the wetland area.

The Least Chipmunk (*selkirki* subspecies): This species is red-listed for the Invermere Forest District. Habitat is at timberline, and it has been observed at the Paradise mine.

Northern Long-eared Myotis: Northern Long-eared Myotis is found in Interior cedar hemlock forests in Revelstoke National Park. It is unlikely to occur in the wetlands.

BIRDS

Columbian Sharp-tailed grouse: This species has been extirpated from the region. It occupied large grassland areas in the south portion of the Trench as far north as Invermere (Ohanjanian 1990) until recently.

Long-billed curlew: This species occurs in small numbers in large grassland areas in the south portion of the Trench (Ohanjanian 1992) and near Windermere (T. Kinley, pers. comm.). This species was observed at Moberly Marsh in May of 1996 (E. Zimmerman, pers. comm.).

Lewis woodpecker: This woodpecker uses open grassland areas and has been observed in a burn area just south of Invermere (Cooper 1996a). It has been observed in nearby areas (Ferguson and Halverson 1997) and in the Columbia National Wildlife Area at Wilmer (T. Kinley, pers. comm.), but the area provides little potential habitat for this species.

White-troated swifts: This blue-listed species occurs at the Dutch Creek hoodoos but is not known to use the clay cliffs adjacent to the wetlands.

There are several species that are of local concern in the area, but are not red or blue listed provincially. Information on these species is provided below. (Western Grebe and American White Pelican are included in this list although it is red listed provincially. These species are not included in the list for the Golden and Inveremere Forest Districts, which would appear to be an error in the listing process for these districts).

MAMMALS

River Otter: River Otters are seen occasionally in the wetlands. Seven otter were observed at Athalmer Slough on Oct. 20, 1997 and five were seen Nov. 1, 1997 at Wilmer Slough (L. Halverson, pers. comm.). A family group appears to have wintered near Athalmer for the last three years (T. Kinley, pers. comm.). They have also been seen at Spillimacheen in 1993 and at Moberly Marsh in 1996 (E. Zimmerman, pers. comm.). The coarse fish populations in the wetlands probably provide a good food source for this species. This species is relatively common at the Creston Valley Wildlife Management Area (B. Stussnoff, pers. comm.), on Kootenay Lake (B. Herbison, pers. comm.) and is seen and trapped occasionally on the Kootenay River (P. Bradshaw, pers. comm.).

Wolf: Wolves are seen occasionally in the wetlands. They have re-colonized this area over the last two decades.

Bats: Several bat species occur in the East Kootenay Trench. A survey of the area is presently underway (Mitchell Ferman, pers. comm.). Large trees and snags in the wetlands and in adjacent forests would provide roosting sites for bats. The wetlands would provide good foraging areas. Little brown bats are common in wetlands (L. Halverson, pers. comm.).

Muskrat: Muskrats are common across their range but are important to consider since they are a major ecological factor in wetland ecology. Major fluctuations in muskrat populations occur in the wetlands (M. Yaternuck pers. comm.). In previous decades she has trapped as many as 2500 muskrats per season.

BIRDS

Wetland Habitats

American White Pelican: White Pelicans are seen during migration only and do not nest in the wetlands.

Western Grebe: Western grebe is also seen occasionally during migration. The nearest colonies are at Leach Lake and Duck Lake at Creston, with another group at Salmon Arm. It may be possible to establish a new colony in the wetlands, if there is a good fishery to support them and their young. They need stable water levels for nesting.

Eared Grebe: This grebe occurs at Trescher slough and nests on Reflection Lake (E. Zimmerman, pers. comm.).

Red-necked Grebe: Red-necked grebes are common at several locations in the wetlands. They nest at Trescher slough at Brisco, at Wilmer and in the slough just north of Athalmer. In the latter, the birds face problems with motor boats disturbing their floating nests.

Black Tern: Black tern occurs at Trescher Slough, Moberly Marsh and at Parson (E. Zimmerman, pers. comm.). There is also a colony at Elizabeth Lake near Cranbrook, at Bummer's Flats (M. White, pers. comm.) and at the CVWMA.

Canvasback and Redheaded Ducks: These species are seen during migration, but the fluctuating water levels in the wetlands make this area a poor nesting area for these species. Red heads are common nesters at the CVWMA, canvasback are less common.

Yellow-headed Blackbird: This species is common in the wetlands.

Black-chinned Hummingbird: The Black-chinned Hummingbird is rare in the wetlands.

American Avocet: This species is seen only occasionally in the wetlands.

Peregrine Falcon: Peregrine Falcon are rare visitors to the area. No nesting sites were found in a quick survey of the Trench in 1996, although two nesting sites were checked that had nesting birds in the 1980's (B. Warkentin, pers. comm.). Peregrines have been seen during the summer in nearby mountainous areas (P. Christensen, pers. comm.).

Northern Goshawk: Northern Goshawk is also of concern. There is evidence from the Pacific North-west that this species requires mid-canopy nesting sites in larger trees in mature and old forests and an overall foraging area of 2000+ ha with a variety of vegetation types. This species may occasionally use wetlands for foraging but are unlikely to nest there.

Osprey: This species is common in the wetlands with many known nest sites.

Long-eared Owl: This species is fairly common throughout its range in B.C. It occurs primarily in deciduous thickets close to grassland and pasture although it also occur in coniferous forests (Canning 1995c). It is keyed to feeding on voles. This species has been seen at Parson and at Moberly Marsh in 1997 bird counts. R. Ferguson has six records between June and October (R. Ferguson, pers. comm.).

Great Horned Owl: This species has been observed nesting near Athalmer (L. Halverson, pers. comm.) and between Nicholson and Golden (E. Zimmerman, pers. Comm.).

Pileated woodpecker: The Pileated woodpecker is the primary forest bird of concern in this area (Ohanjanian 1991). This species requires large ponderosa pine, black

cottonwood, aspen and western larch trees and snags as nesting habitat. The large diameter cottonwoods that occur in the wetlands are very important nesting habitat for this species since ponderosa pine does not occur in adjacent areas. Cottonwood and western larch are the only species used for nesting that occur in the area. This is a very important species since it is a primary cavity excavator.

Le Conte's Sparrow: The status and range of Le Conte's Sparrow in B.C. is not well known. They occur in the Peace River country and have been recorded near Revelstoke and on the deltas of Horsethief and Dutch Creeks (L. Halverson, pers. comm.). One was seen in spring of 1997 by L. Cambell near Invermere. Their nesting habitat, which consists of seasonally wet meadows with high willows, and the drier areas in creek deltas, is vulnerable to conversion to hayland.

Willow Flycatcher: This flycatcher is common in the wetlands (E. Zimmerman, pers. comm.). This species is used as an indicator species for riparian habitat in the Malheur National Wildlife Refuge in Oregon (Anon. 1990 and 1995).

Gray Catbird: This species is uncommon but does nest in the area.

Veery: This species has been observed on the Horsethief Creek fan, at the south end of Columbia Lake and at Moberly Marsh.

Other bird species that are of concern, but are probably incidental in occurrence in this area include:

Canyon Wren (Canning 1995)*

Grasshopper Sparrow (Canning 1995b)*

Gray Flycatcher (Canning 1995a)*

Yellow-breasted Chat (Canning 1995d)

Brewer's sparrow (Enns and Siddle 1996)

Western Screech Owl*

Upland Sandpiper*

Horned lark

Cape May Warbler*

Green Heron (Fraser and Ramsey 1996).*

Burrowing Owl

Rocky Mountain (Natalie's) Williamson's sapsucker (not recorded in this area (Cooper 1995).

* There are no records to date for these species in the Upper Columbia (R. Ferguson, pers. comm.).

AMPHIBIANS AND REPTILES

Other species of concern in the area are:

Columbian spotted frog occur both in the wetlands and in potholes and small lakes on the surrounding benches, from the south end of Columbia Lake to Moberley (Ohanjanian and Teske 1996). Their numbers are not abundant. Wood frogs probably occur in the wetter environments at the northern end of the Columbia Marshes. Pacific chorus frogs may also occur.

The Long-toed Salamander lives in down wood and logs close to wetlands. They court and mate in wetlands, then return to live under down woody material nearby. This species is common in the wetlands (L. Halverson, pers. comm.). I. Ohanjanian (pers. comm.) suggests that areas within 200 m of wetlands should not be included in enhancement burns so that down woody material is not consumed by the fire.

The Western Toad is not listed in B.C. but is a concern since there is evidence of its disappearance in the northern states (I. Ohanjanian, pers. comm.). This species is relatively common in the wetlands.

The Coeur d'Alene Salamander (red listed) is unlikely to occur in the Columbia Marshes. It lives in seeps and low volume streams where exposed rock and wet talus slopes provide cover. A survey of this species was carried out in 1996-97, (I. Ohanjanian, pers. comm.) in other parts of the region, but the slopes above the Columbia marshes were not surveyed.

The Tailed Frog (blue listed) lives in clear, fast moving streams with a boulder substrate. It is primarily a coastal species, but a disjunct population occurs in the Flathead drainage. This species is unlikely to occur in the Columbia Marshes.

FISH

Burbot: Burbot were once common and supported important fisheries in Columbia and Windermere Lakes. Dutch Creek and an unnamed spring at the south end of Columbia Lake are known burbot spawning areas. Burbot are also reported to spawn in Horsethief Creek and the Spillamacheen River. A study of burbot has been initiated in Columbia Lake and twenty six fish have been implanted with radio transmitters. To date they have not left Columbia Lake (B. Westover, pers. comm.).

Pygmy Whitefish: This species occurs in the Golden area, but is restricted in distribution and habitat type (fast flowing streams) and is unlikely to occur in the wetlands.

INVERTEBRATES

Butterflies and moths: The status of rare and endangered invertebrates has been identified as a provincial concern (Scudder 1994). Syd Canning (pers. comm.) has suggested the need for surveys in the E.K. Trench; three rare butterflies would be of special concern. These are:

A large Copper (*Gaeides xanthoides*) that lives at Elizabeth Lake near Cranbrook and nowhere else in the province. It is keyed to an aquatic plant that grows along the shore of the lake. The adult lays its eggs on this plant and the larva eat the leaves. The adults nectar on a variety of flowering plants around the margins of the lake. This species may occur in portions of the wetlands where this aquatic plant occurs.

Another rare subspecies (*Mitoura siva barryi*), is found in the Windermere area with a disjunct population found at Merritt. It is keyed to juniper habitats. The pupae live on juniper spp., the adults require a nearby nectar source in grassland flower species. It may occur where juniper habitats are included in the WMA, i.e. in the Radium Hot Springs corridor.

A Fritilaria subspecies (*Speyeria aphrodite whitehousei*) is found in open range areas from Brisco to Elko. This is the only place it is found in B.C., although a different subspecies has been identified at Williams Lake. This butterfly lays its eggs in the fall on the dead stocks of a species of violet that to date has not been identified. It is found in grassland habitats and there may be impacts from grazing and other human activities. It may occur where grassland habitats are included in the WMA, i.e. in the Radium Hot Springs corridor.

Mollusks: The provincial museum plans to do some work on fresh water mussels in 1998 in the Kootenays (S. Canning, pers. comm.). Mussels occur in Windermere Lake, but are unlikely to occur in the wetlands since they require a gravel substrate on the river bottom.

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**APPENDIX III. MAPS OF THE COLUMBIA WETLANDS WMA.
(1:100,000 scale)**

The Wildlife Management Area is indicated in pale green. Land managed by the Canadian Wildlife Service are indicated in pink, Nature Trust lands managed by the Wildlife Program are indicated in orange and provincial parks are indicated in dark green. Private land is pale yellow.

APPENDIX IV. BOUNDARY ISSUES

The boundary of the Columbia Wetlands WMA was defined during the process of submitting the area for WMA status (Jamieson 1996). However, several outstanding issues were identified in that process. This issue areas are described below, with recommendations on adjustments to resolve these problems.

The boundary of the proposed WMA is described by the pale green line on the accompanying 1:20,000 maps. Private lands adjacent to the WMA are outlined in blue; Nature Trust lands and federal lands managed by the CWS are indicated in pink. Lands managed by the Wildlife Branch are indicated in orange; Provincial and National Parks are indicated in dark green; Indian Reserve lands are indicated in purple, and crown lands under lease are indicated in red.

In general the CPR right-of-way and private land boundaries are used as a boundary on the east side of the wetlands. On the west side lot lines (many from lots surveyed on crown land) and metes and bounds were used. All private land within the wetlands were excluded. The Columbia River and all of its side channels have been included in the proposed WMA. The present Wildlife Sanctuaries and Nature Trust lands managed by the Wildlife Branch are included in the proposed WMA.

The major areas of concern, from south to north along the east side of river, then from south to north on the west side of the river, for each block, are discussed below.

BLOCK 1. Fairmont Hot Springs to the south end of Windermere Lake. (Map 3. - 82J 021)

1. The Columbia River through Fairmont Hot Springs Resort: This portion of the river would provide a connection to the WMA on Columbia Lake, however, the river has been severely altered on its course through the Fairmont golf course. This portion of the river has not been included in the WMA.

2. Sublot 112: The upland portion of Sublot 112 contains a license of occupation (0307478) for a regional garbage collection facility. The entire lot was included in the WMA, rather than attempting to use the high water mark as a boundary for the marshland portion of the block. The block provides a connection to SL 120 and the mountain ranges to east. No change to the boundary is suggested.

3. Sublot 120: The option exists to extend WMA status east to include Sublot 120, connecting to crown land to the east and the face of the mountains. The Regional Land Use Planning Process (CORE 1994) indicated the need for such connections; however at this site there are no options for a corridor from the wetlands to the west since most of the land on the west side is private. If SL 163D is acquired in the future, consideration should be given to including SL 120 in the WMA.

4. Columbia Lake Indian Reserve boundary: From Fairmont Resort to the south end

of Windermere Lake, the boundary of the reserve is the mid-line of the Columbia River, according to T. Munson, Habitat Protection Officer for the K'tunaxa Tribal Council. The WMA boundary is defined using the same boundary description.

5. Lot 295: This lot is at the south end of Mud Lake, between Lot 5352 (airport) and a river channel that separates it from crown land to the north.. This lot belongs to Fairmont Resort.

6. Lot 5 and Mud Lake: this area is referred to on the cadastral maps as ref. 4420595, which appears to be in error. The area to the north of Lot 295 to where the Columbia River pinches out against the CPR right of way is indicated as Crown on a 1912 survey. Lot 5 is a small lot dating from a 1912 survey when it was apparently an island. (There is a reference to this Lot 5 as 4.73 ha (11.7 ac) located within DL 205). It has since reverted to the Crown. This area has been included in the WMA. From the air photo of the area (See Appendix IV.) there seems to be a substantial change in the location of the main channel along the north edge of this unit, as indicated on the cadastral maps. The old channel shown as the boundary between this block and the Columbia Lake Indian Reserve is now grown in with vegetation, indicating a substantial accretion of land to the Reserve lands. This is not a substantial issue since the land involved is wetland and is of minor economic value, but it should be clarified at some point.

7. The portion of Lot 4596, Sublot 163D east of the CPR right of way: The wetland area south of Lot 217 and east of the CPR right of way appears to be a portion of subplot 163D. Other mapping related to that subplot indicates a boundary that does not appear to follow the river channel as is indicated on the cadastral map. This area has been treated as private and is excluded from the WMA.

8. Upper Windermere Lake UREP -South Portion: The southern and larger portion of UREP reserve 0230191 is located adjacent to the wetlands south of Windermere Lake . This is an area of open grassland and clay slopes with clumps of over-stocked Douglas fir on the north-facing slopes of several gullies running down to the marshes. There are some ungulate wintering values, limited by the severity of the site. Timber and grazing values are marginal. This portion of the UREP has been included in the WMA, along with a smaller area of crown land to the south that is surrounded on three sides by Lot 163D of the former Hofert property. (This UREP will revert to regular crown land in the near future as part of the follow-up to the regional land use plan). Its primary value would be as an ecological benchmark protecting the dry site plant communities found there.

BLOCK 2. Windermere Lake. (Map 3. - 82K 050)

1. South end of Windermere Lake: A portion of the south end of the lake was included in the draft boundary of the WMA, to provide for control of boating and other activities during the nesting and migration seasons. This is a shallow, open water lake that is heavily used for boating recreation, especially at the north end. There are extensive areas of emergent vegetation at the south end of the lake. Ducks are often seen rafted up in the areas proposed for WMA status, out in an open part of the lake. In the long term, a boundary in the lake will probably have to be marked with buoys and signed. According to members of the Lake Windermere District Rod and Gun Club, most bird hunting takes place in Mud and Tatley Lakes, not at the end of Windermere Lake. They also noted that in spring and fall relatively little boating activity takes place.

Options for a boundary are:

a. The original boundary used the south east corner of Lot 13, Plan 5332 as a reference point for a east-west line across the south end of the lake, at the south-east corner of the Rushmere development. The site was re-assessed in Sept. 1997. There are boats moored adjacent to the site on a beach across the tracks from the development. There is also a set of buoys on the east side of the lake that would appear to be a water-skiing slalom course. (Contact is Bill Hendrikson 427-7217). The course is south of the proposed line and therefore in the WMA.

b. The WMA boundary could be moved to the south to reduce problems with infractions by boaters, but there is no obvious tie point or legal survey point that could be used to define the west end of the boundary. One could use "200 m south of the south east corner of Lot 13, Plan 5332" as a reference point for a east-west line to solve the problem with boat access at Rushmere, but the water-skiing buoys would still have to be moved. This boundary would still include most of the emergent vegetation.

c. Another alternative would be to use "700 m south of the south east corner of Lot 13, Plan 5332" as a reference point for a east-west line. This would leave the water-skiing buoys outside the WMA and would include about 50% of the emergent vegetation areas.

d. One could also use the "north-east corner of Plan 1203, Lot 346, which would appear to be a lot created for a railway siding, near the mouth of the river. This corner however is only slightly north of the mouth of the river and would leave most of the emergent vegetation outside the WMA.

e. One could also use "a line running north-east of the north-east corner of Plan 1203, Lot 346". This boundary would include about 50% of the emergent vegetation in the north end of the lake. Buoys would be required to define this boundary.

f. One could use "a line running west to east from the north-east corner of Lot 12576". This boundary would include none of the lake. This option would be easiest option to enforce.

The ownership of the Columbia River channel upstream of the lake by the Shuswap Band complicates this problem, as indicated in point 4 above. Further discussions will be required with the band council to clarify their interests.

The boundary of the WMA has been revised using option e. Discussions will be required with the Columbia Band Council to clarify their interests in this area. I have assumed that a permit could be issued to the Columbia Lake Band to allow them, or persons permitted by the band, to traverse the WMA with boats with larger motors than 10 HP, in order to get to their land east of the river channel.

2. UREPs and park lands on Windermere Lake: There are two UREPs (UREP 0303087, a small crown lot (1-3 ha) on the south-east edge of the Rushmere development, and the northern portion of UREP 0230191, located north of the Rushmere development) and some lands bought by BC Parks (Sunshine Ranch Park Reserve, subplot16 and Lot 107). These areas have not been included in the WMA and will continue in Park reserve status or will revert to ordinary crown land.

BLOCK 3. The marshes and riparian areas from the north end of Windermere Lake to Radium Hot Springs. (Map 4. - 82K 060)

1. Columbia River Outlet: It was originally suggested that the Columbia River should be included in the WMA, beginning at the outlet of Windermere Lake just north of the bridge at Athalmer. This is no longer tenable. A marina has been developed south of the bridge and here is a boat launch developed just north of the bridge. Boaters need some room to turn around when launching, so I would suggest that the boundary be moved north. There is a dwelling about 300 m north of the bridge, with a dock and boat. The south-west corner of Block D., Plan 1143 where that dwelling is located would work as a tie point, except for any boat over 10HP used by the resident in the dwelling on that lot. Therefore the boundary has been defined as "100 m. north of the south-west corner of Block D., Plan 1143". (The north-east corner is in the wetland and would be difficult to locate and mark). A sign on a buoy or on the old piling located there would be required. The pond just to the north is an important breeding site for grebes, which are floating nesters which are disturbed by boats and wake, so it is important to limit large motor access to this area. Comments were received from one person who claimed that they had used Athalmer Pond for several years as a water-skiing slalom course. This area stays open during most winters and waterfowl stays in this area through the winter (I. Jack, pers. comm.). Maintaining a connection through the lake is important (Jamieson and Ohanjanian 1994) for the movement of small wetland species.

2. Shuswap Indian Reserve boundary: From Athalmer to just south of Horsethief Creek, the boundary of the reserve is the mid-line of the Columbia River. The WMA boundary is defined as the mid-line of the main channel. Options for controlling access to this portion of the river should be discussed with the Shuswap Band and the K'tunaxa Kinbasket and Shuswap Tribal Councils.

3. Athalmer Pond: The boundary between private and Crown land in the area directly north of Athalmer is indicated on a separate lot map in the map folio. There are Crown lots surveyed in the wetlands that could not be developed without a major land fill. Crown lot 1, Plan 1881, in the name of BC Lands, was not included in the original WMA proposal. It is located just north of the Athalmer, just north and west of the Athalmer bridge. There is considerable local concern that this lot not be sold or developed. This lot has a long history. It is one of three crown parcels in Athalmer that have been part of a long standing local debate. The other two parcels have been sold to private interests by BC Lands, for development. Several local people are adamant that this final lot should remain as wetland and should not be sold or developed. Local people have indicated that former Minister Moe Sihota agreed that if the other two lots were sold and developed, that this lot should remain natural. They see the idea of a wetland interpretative centre on these lands as a ploy for development of the site. The three parcels were apparently is some kind of protective status for wildlife up to the 1980's. Based on these arguments, this lot has been included in the WMA.

4. Wilmer slopes: The WMA includes subplot 12 of lot 375 (3T4 NEL #12) which includes steep slopes west of Wilmer that were previously under a reserve for wildlife.

5. Dry Gulch Corridor: The WMA includes a corridor of crown land east from the wetlands in the Dry Gulch area to join Kootenay National Park. Lots 9249 and 8996 adjacent to Kootenay National Park, Sub-lot 67 and Lot 1, DL 9177, Plan 8413 are crown lots that are reserved for wildlife management purposes. There are three lots (9566, 65 and 60) adjacent to the headquarters of Kootenay National Park that have been acquired by national parks, or are part of a proposed trade that has not yet occurred. The status of these lots was not checked since they are isolated from the remainder of the WMA. Reserve No. 4492257 in SL 67 is a sand and gravel reserve for the Department of Transportation and Highways; it has been excluded from the proposed WMA. This corridor is also important winter range for bighorn sheep, deer and elk. The unnumbered lot just to the south of Kootenay National Park that is included in this proposed corridor is part of a proposed land trade between the province and the federal crown to expand Kootenay National Park (A. Dibb, pers. comm.). WMA status should not stand in the way of that trade if it occurs in the future. (Several other blocks in the Radium Hot Springs area just to the north are also part of that potential land trade). Dry Gulch Provincial Park is a small park adjacent to the south-west corner of Kootenay National Park that may contribute to corridor values in this area. There is a small lot with Res. # 0332331 attached, at the north end of the park, adjacent to the national park. It is isolated

from the remainder of the WMA and has not been included in the WMA. No changes to the boundary in this area are required.

6. Gravel Reserve below Radium Highway Lookout: The Department of Highways has a reserve on crown lands just south of Radium immediately below Highway 95 and the viewpoints on that road. This reserve (209811) is for long term sand and gravel requirements, although it also plays a role in ensuring that no human activity takes place below the highway where there may be some potential for land slippage. It is very unlikely that gravel could be extracted, or exists on the portion of the lot below the CPR right-of-way, which is wetland. The Ministry was approached. They wish to retain the leases for the time being. If this lease is released in the future, it should be included in the WMA in the future. The contact at Highways is Jason Jackson at 354-6682. He is in charge of sand and gravel reserves.

7. Lower Toby Creek: Lots 4 to 10 of L. 375 between the Toby Creek bridge and Wilmer, are private and run down to Toby Creek. Lots 1, 2 and 3 of L. 375 are truncated, with the lower half of each lot remaining as crown. The status of these lots was checked with the land owners. No change to the boundary is required.

8. Lower Horsethief Creek: Lot 7912 on Horsethief Creek was included the original proposed boundary. The north half of this lot is private (D. W. Kuchanko) and the original boundary has been changed to reflect this. Lot 5052 to the east is crown as are the two smaller lots to the north (L. 4615 and L. 6376). These two lots are on the benches above the wetlands and are typical dryland site with over-stocked Douglas fir. Including them in the WMA will provide some minor options in the future for maintaining values adjacent to the wetlands.

9. Lower Forster Creek: This is the area one looks down on from the Radium Hill lookout on Highway 95. In the original boundary map, only Lot 2579 is shown as crown. However, Hans Feldmann made a land trade several years ago, trading that portion of Lots 2578 and 2577 east of Forester Creek, for lands closer to his ranch homestead on Lot 702, higher on Forester Creek. The boundary has been revised to reflect this change.

BLOCK 4. Radium Hot Springs to Nicholzen.

Starting just north of Radium Hot Springs is the largest block of wetlands that is proposed for WMA status. Fourteen maps (1:20,000 scale) are required to describe the area. Issues on each map sheet are discussed below.

Radium Hot Springs to Edgewater: (Map 5. - 82K 070)

In this portion the proposed WMA is defined almost entirely by lot lines. The Columbia River is included from the unit to the south to connect with the wetland block in the Wilmer area.

1. West side - from the Radium/Horsethief bridge to RCMP Flats: There are several

crown blocks on the west side of the river just north of Radium that are adjacent to the wetlands. There are steep slopes rising from the wetlands with some sites with older Douglas fir. The bench lands above support thick stands of younger Douglas fir, with thickets in many areas. Land use issues are complex along this section of the wetlands with a dump site for the local mill, cattle handling facilities, a fenced cattle lane to the river and Christmas tree permits in the area. There are three options for a boundary in this area.

a. Include all of the crown lots that abut the wetlands between the Radium/Horsethief bridge and RCMP Flats. This option would include substantial areas of benchland and would be traversed by the Red Canyon forest road. It would include a dump site, and a cattle handling facility.

b. Include the wetlands portion of these lots only. This would be a simple administrative boundary, but would not include any potential values on the steep slopes above the wetlands.

c. Include the east half of most of the lots, to include the steep slopes above the wetlands but keep most of the bench lands out of the WMA. This would be a more complicated boundary but would protect most important wildlife values.

Option c. was used, with slight revisions from the boundary used in the original WMA proposal.

Edgewater to Brisco: (Map 6. - 82K 070)

In this portion the proposed WMA is defined almost entirely by lot lines with metes and bounds used in some areas. The Nature Trust lands (RCMP Flats) near Edgewater are included in the WMA. There are several minor boundary issues in this section.

1. North-east quarter of L. 11114: This is a crown lot with a small piece above the railway tracks. That portion above the tracks was excluded.

2. Lot 352, Sec. 4: This is crown lot with small piece of the lot above railway tracks. That portion above the tracks was excluded.

3. Lot 352, Sec. 3: A portion of this private block is across the Columbia River from the majority of the block. This small unit of private land is surrounded by WMA lands.

4. Lot 351, Sec. 2: A portion of this private block is across the Columbia River from the majority of the block. This small unit of private land is surrounded by WMA lands.

5. Lot 351, Sec. 6: A portion of this crown block is above the tracks and includes a small wetland. This block is included in the WMA.

6. Lot 351, Sec. 12: A portion of this crown block is above the tracks and includes a

small wetland. This block is included in the WMA.

7. West side boundary along Steamboat Mtn: From RCMP Flats north to Lot 10735 (belonging to L. Halverson's) just south of Brisco, the wetland abuts crown land to the west. As in the case further to the south, there are three options for a boundary. These are:

- a. Include all of the crown lots that abut the wetlands. This option would include substantial areas of bench land and would be traversed in places by the Red Canyon forest road. It would include substantial areas of bench land in the WMA.
- b. Include the wetlands portion of these lots only. This would be a simple administrative boundary, but would not include any potential values on the steep slopes above the wetlands.
- c. Include the east half of most of the lots, to include the steep slopes above the wetlands but keep most of the bench lands out of the WMA. This would be a more complicated boundary but would protect most important wildlife values, including possible habitat for rubber boa snakes. There are two sites with very old Douglas Fir along this section of the river that should be given some level of protection within the WMA.

Option c. has been used as the boundary. This portion of the boundary is similar to that used in the original WMA proposal.

Brisco to Spillimacheen: (Map 7. - 82K 089)

There are no changes to the boundary in this section.

Spillimacheen River to Harrogate: (Map 8. - 82K 088 and 82K 099)

1. TFL 14 Boundary: On the west side the wetlands abut Tree Farm License 14, belonging to CFI, from private land just north of the Spillimacheen River to private land (Well's Landing) just south of Parson (on Map 9). Several legal descriptions and maps were consulted in looking at the boundary in this area. There are major discrepancies between these sources that suggest errors have been made in the past in defining the TFL boundary.

In the legal description for TFL 14 the boundary is defined as "... the natural boundary of swamp land along the Columbia River between the 795.0 and 799.0 meter contour lines;...". According to Thurber 1980, the wetland is at a much lower elevation, at 780.0 to 786.3 m (See Table 1.). The difference is 15.3 m at Horse Creek and 12.7 m at Spillimacheen. There also appears to be an error in the 1:20,000 cadastral mapping that shows the TFL boundary and the OIC 229802 boundary as the same line. In fact, the boundary is different by 15.3 m at Horse Creek (Table 1.).

To check this, I located the 795.5 m elevation on the east side of the river north of Parsons, where it is indicated as a dotted line and crosses the highway. Although I did not do any measurements, it is obvious that the 795.5 m line is 10-20 m above the level of the wetlands. This would suggest that the elevations in the legal description for the TFL (795.0 and 799.0 m contour) describes an elevation that is 12-15 m above the water level in the wetlands. In areas with low gradient adjacent to the wetlands, that would put the TFL boundary at some distance from the wetland edge.

Options for establishing a boundary along the west side where the wetlands are described below.

- a. The original CORE report proposed the Biogeoclimatic line as the boundary. This would be impossible to define on the ground, but indicates that the CORE table wanted to include substantial areas of forest land adjacent to the wetlands in the WMA.
- b. The WMA boundary could include those lands up to the boundary of the TFL, as presently defined at "...between the 795.0 and 799.0 meter contour lines;...". This would put the boundary 12 m above the wetlands at Spillimacheen and 15 m above the wetlands at Horse Creek. Finding this elevation for legal purposes would be very difficult and expensive.
- c. There are established lot lines throughout the length of the wetlands. Using these lot lines would provide the most precise legal description for the area but would include fairly extensive areas of benchland and slope. Timber on these benchland sites within the WMA would be available for logging, but perhaps under more stringent conditions

than would apply to adjacent crown land. This lot line boundary could create a jagged line along the steeper slopes adjacent to the wetlands if forest management was different under the two designations. This could create some jarring visual impacts from viewpoints on the opposite side of the wetlands. CFI has concerns about the costs of doing legal surveys to establish the line when logging is planned. Such surveys could be very expensive since most of the legal survey points have probably not been checked since the early 1900s.

d. The no harvest zone in the riparian guidelines under the Forest Practise Code (50 m from the waterline) or the no harvest plus management zone (50 m + 50 m), could be used as a boundary, defining a line 50 or 100 m from the wetlands.

e. There is a steep slope above the wetlands for most of this distance, 200-400 feet above the wetlands, with lower gradient benches above. The break between the steep slope and benches would make the best ecological boundary. In the original proposal, a boundary was drawn that used established lot lines and tie points that approximated the slope break.

All of these options have serious practical problems. The original boundary description (option e.) has been used to define the boundary for this portion of the wetlands.

2. Spillimacheen Provincial Park Reserve: This is a block of crown land at the mouth of the Spillimacheen River that has been a park reserve for some time. It consists of wetland with about half of reserve in forest land above the wetlands. A letter dated Jan. 4, 1988 from Mike Hanry, Regional Planner for the Parks Branch, to Lorraine Schmidt of B.C. Lands, (in the reserve file at the Cranbrook Land Branch) indicates that "This reserve does not have park development potential, however, it was established in recognition of the high quality waterfowl habitats and natural marsh and river features. The area may eventually warrant "wildlife management area" status." The wetland portion of this reserve has been included in the WMA.

Harrogate to Parson: (Map 9. - 82K 008 and 82K 097)

1. Lot 19 at Parson. This lot is just across the bridge from Parson, west of the river. The south-west quarter is private, the remainder is private. This was checked only with local land owners. I have assumed in this case that the person who put the land ownership maps together made a mistake in describing this parcel as entirely private.

2. Small lot just north of Parson. This small wetland is located directly north of the CFI office at Parson (portion of south-west quarter of section 30). There is an old sawdust pile at the south end. It is indicted as crown on the cadastral maps, but some local people though it was private. I checked with CFI and they were not able to find any indication that it belonged to them. It is included in the WMA.

Parson to Nicholzen: (Map 10. - 82N 016 and 82N 017)

1. West side Boundary: From McMurdo to just south of Nicholzen the boundary has

been described as indicated above in relation to TFL 14. From Nicholzen north most of the land west of the wetlands is regular Crown land. This is in the Golden Forest District and is the operating area of a different forest company. The same options apply. Metes and bounds related to crown lots were used for the boundary, as was done to the south in TFL 14.

BLOCK 9. The dryland area at Nicholzen created by the alluvial fan of Canyon Creek, most of which is private farmland. (Map 11. - 82N 026)

South of Nicholzen there is some crown land along the river that is included. Two crown lots on the west side were included since they contain riparian and wetland areas in the lower portions of the lots. The main channel of the Columbia River is included in the proposed WMA through this area. Most of this area is not included in the proposed WMA since it is almost entirely private land.

BLOCK 10. The marshes and riparian areas from Nicholzen to the mouth of the Kicking Horse River at Golden. (Map 11. - 82N 026)

All the crown land in this area is part of the proposed WMA, including Reflection Lake just south of Golden which is separated from the main wetland area by Highway 95 and the CPR right-of-way. This is a very productive marsh with high recreational value.

The boundary in this area is defined by private land, the CPR right-of-way and metes and bounds in two crown blocks on the west side.

1. Kochura and Saunders properties. The lot lines in this area have been revised to reflect information provided by C. Kochura. These properties are defined by the wetland boundary rather than lot lines in some areas. The maps provided by C. Kochura are available in the file on boundary concerns provided with this report.

BLOCK 7. The townsite of Golden. (Maps 11 & 12. - 82N 026 and 82N 036)

The town of Golden is built on the alluvial fan of the Kicking Horse River. The Columbia River is compressed into a fast flowing river at this point with no marsh areas. The main channel of the Columbia River through this area has been included in the proposed WMA.

BLOCK 8. The marshes and riparian areas from Golden to the mouth of the Blaeberry River. (Map 12. 82N 035 and 82N 036)

The boundary on the east side in this area is defined by the CPR right-of-way. On the west side it is defined by metes and bounds. The Bergham property and Gadsden

Provincial Park as far south as Moberley Station is presently a wildlife sanctuary with no hunting, trapping or discharge of firearms. Burges and James Gadsden Prov. Park is not included in the proposed WMA. The Bergenham property is included.

Tp 28, R2, W5M - Section 3, north-west quarter: There is a lease for sand and gravel reserved for the Department of Transport and Highways on the portion below the highway. The site was looked at and no access or development was obvious. The lease includes a portion of one of the islands in the river. The Ministry was approached. They wish to retain the leases for the time being. If this lease is released in the future, it should be included in the WMA in the future.

BLOCK 9. The floodplain habitat along the Columbia River from the Blaeberry River to Donald. (Map 13. - 82N045)

The boundary on the east side in this area is defined by the CPR right-of-way and three private blocks. On the west side it is defined by metes and bounds and private land at the north end.

Uncertainties in land ownership and the WMA boundary.

1. Boundary on Lower Forster Creek. (Map # 5.): The west boundary of Lot 2577 and 2578 is the west edge of Forster Creek, however the map line from a map that H. Feldmann showed me does not appear to follow the creek. This is likely a legal problem with land accretion.

2. Lot 19 at Parson. (Map # 9.): This lot is just across the bridge from Parson, west of the river. The south-west quarter is private, the remainder is private. This was checked only with local land owners. I have assumed in this case that the person who put the land ownership maps together made a mistake in describing all of this lot as private.

3. Small lot just north of Parson. (Map # 9.): This small wetland is located directly north of the CFI office at Parson (portion of south-west quarter of section 30). There is an old sawdust pile at the south end. It is indicted as crown on the cadastral maps, but some local people thought it was private. I checked with CFI and they were not able to find any indication that it belonged to them. It is included in the WMA.

APPENDIX V. FIVE YEAR WORK PLAN

Below are the management actions and projects proposed in the management plan for the period 1998-2002.

YEAR 1.

These are actions that are required immediately and upon which future actions depend. In all cases, no effective action can be taken on other issues until these programs are in place.

ADMINISTRATIVE ACTIONS:

- 1. Establish a source of long term funding for the management of the WMA.**
- 2. Apply for funding for inventory projects for future years.**
- 3. Investigate the concepts of joint stewardship and joint management with First Nations.**
- 4. Support inventories of archaeological and native use sites in the WMA.**
- 5. Initiate licensing of commercial tourism operations.**
- 6. Resolve any outstanding boundary concerns.**

MANAGEMENT ACTIONS:

1. Initiate baseline surveys of fish populations.

Support a fisheries survey that has been proposed to the HCTFBC by Steve McAdam, Hydroelectric Impact Biologist, Fisheries Section, Nelson.

2. Document the ecological and human history of the wetlands.

A better understanding of the factors that have defined land forms, vegetation and wildlife numbers in the past will assist in managing the WMA in the future.

YEAR 2.

The following projects should be carried out early in the five year plan. Later actions will be contingent on the information provided by these projects.

ADMINISTRATIVE ACTIONS:

1. Investigate options for public involvement in the management of the WMA.

The concept of river keepers or other means to involve local people in the ongoing management and protection of the wetlands should be explored.

MANAGEMENT ACTIONS:

1. Initiate a long term vegetation and land form monitoring program.

A survey of rare and endangered plant species should be part of this project.

2. Investigate acquisition options.

3. Initiate a project to monitor the use of riparian areas by migrants, for nesting and as a stop-over site during migration.

This would be a co-operative program between CWS, MELP and local volunteers.

4. Initiate a program to monitor water quality.

In the long term, potential pollution of the Columbia River and its tributaries could have a major impact on the ecosystem health of the wetlands. Records of water quality, including nutrient loading, should be collected and archived.

5. Identify of old salmon spawning areas.

This project should be considered jointly with the K'tunaxa Tribal Council.

6. Investigate the status of cottonwoods stands in the WMA.

More detailed work on this issue should be considered a priority.

7. Initiate a survey of use of riparian forests and adjacent forests by cavity nesting birds.

A survey should be carried out to see if a major nest box program can be justified. If there are sufficient natural cavities, given home range and food availability limitations), then such a program may not be productive.

8. Support research, if proposed, on the effectiveness of browse rejuvenation by slashing or burning in providing browse for ungulates in severe winters.

9. Support development of a habitat enhancement plan for the Radium Hot Springs/Stoddart Creek portion of the WMA.

A habitat management plan should be developed for this part of the WMA, as part of a habitat plan for the Radium Hot Springs/Stoddart Creek sheep herd. Forest ingrowth is a major problem in this area.

YEAR 3 TO 5.

ADMINISTRATIVE ACTIONS:

1. Discuss with CPR options for minimizing the impact of their operations on the wetlands.

MANAGEMENT ACTIONS:

1. Goose Nesting Platforms.

The Wildlife Program will work with local rod and gun clubs and other interest groups to maintain the number of nesting platforms at the present level, or as required to maintain blue heron populations.

2. Carry out an assessment of habitat management options on alluvial outwash plain sites and adjacent areas:

An assessment of enhancement and protection options should be developed for the outflow areas of Horsethief Creek, Forester Creek, Bugaboo Creek and Spillamacheen River. The full range of options on these sites should be considered.

3. Initiate a program for protecting older age cottonwood stands, dependent on the outcome of the cottonwood study.

4. Develop tools to protect heron rookeries, if required.

5. Establish nesting platforms along the edges of the wetlands for bald eagles and

osprey, dependent on the outcome of the cottonwood study.

6. Create natural snags along the edges of the wetlands, dependent on the outcome of the cottonwood study.

7. Install nest boxes for cavity nesting birds, if justified by the survey of cavity nesting birds in the wetlands.

8. Consider browse rejuvenation by slashing or burning, if justified by ungulate numbers and the results of further work on the degree to which burning increases the availability and palatability of browse for ungulates.

9. Carry out a survey of special habitat types adjacent to and in the wetlands.

Clay bank sites, steep rock/ rubble sites, older age Douglas-fir forests along the edges of the wetlands and the plant communities in the riparian flats between Moberly and Donald should be investigated. Options for protection should be identified.

11. Carry out enhancement projects in the Radium Hot Springs/Stoddart Creek area, based on the habitat enhancement plan for the area.

12. Initiate a program to monitor recreational and other human use of the wetlands, if justified by use numbers.

PRIOR ENHANCEMENT PROJECTS AND MANAGEMENT ACTIONS

Listed below are the wildlife enhancement projects and ongoing management actions presently active in the WMA.

1. Moberly Marsh development.

This project was initiated in 1972 with a third segment completed in 1990. It provides flood protection for 377 ha of wetlands and 17 km of shoreline.

2. Parson Marsh development.

A small marsh development has been established on the property of Jim and Val Davidson at Parsons, working with Ducks Unlimited and the CBFWCP. It provides 18 ha of wetland and 2.5 km of shoreline.

3. Goose nesting platforms.

Several projects over the last two decades have established nesting platforms in the wetlands.

4. CBFWCP nest box program.

The program has >120 nest boxes (wood duck/merganser size) established in the wetlands.

5. CBFWCP heron rookery monitoring program.

The program carries out an annual survey of heron rookeries.

6. CBFWCP Mirror Lake Project.

The program is investigating declining water levels and possible management options, with the assistance of Ducks Unlimited.

7. The CWS monitors waterfowl nesting success on a regular basis.

8. Ungulate numbers are monitored annually in a joint MELP/CBFWCP program.

APPENDIX 1A. PUBLIC COMMENT

NOTES ON THE PUBLIC MEETINGS HELD

COLUMBIA RIVER WETLANDS WILDLIFE MANAGEMENT AREA

INVERMERE PUBLIC MEETING

November 12, 1997

The following is a record of questions, answers, and comments which followed Mr. Jamieson's presentation of the meeting objectives and the nature and values of the Wildlife Management Area. The names of some of the speakers are missing (? ?) or may be misspelled. Not all of the responses / answers were recorded; it was felt more important to record the questions and comments which could then be addressed subsequently in the WMA Plan.

Don Hasset

- questioned provincial jurisdiction on the Columbia River; felt it was a federal, Coast Guard, responsibility.

Dave Phelps (DP)

- acknowledged that it may be so, and that the Navigable Waters Act may apply, but there is nothing in the 10 hp reg to limit navigability. It is an issue lawyers should deal with.

Chris Isbanel ?

- mentioned that the use of motor boats downstream of Invermere has increased considerably since 1985.

Gail Berg

- pointed out the apparent emphasis on fauna vs. flora in the WMA plan. There is need for a vegetation inventory. Is this being dealt with?

DP & Bob Jamieson (BJ)

- This need is acknowledged as is the need to consider the impacts of any recreational or enhancement activities on vegetation.

Anne Jardine

- Why are frogs dying off / disappearing?

BJ

- reasons for decline are ozone / uv levels; redleg.
- they seem to be “coming back” at Lake Lillian.

Joyce Hutcheson

- Is the plan going to address water-quality issues? E.g. the impact of communities of Invermere and Windermere, and of mines on river and wetland water quality.

BJ

- Indications are that impacts are minimal but must be aware of possibilities. Need to ensure the protection of coarse fish. Could be a concern re pesticides and fertilizers from golf courses

??

- there is less and less use of nitrate fertilizers on golf courses.

??

- What is the role of fire in the floodplain ecosystem?

BJ

- probably minimal.

??

- Windermere lake, at breakup, smells awful -- suggestion being it is due to a buildup of pollutants releasing gases during the thaw. Disappears in about a day and a half. Expressed concern for water quality

Carla ?

- it always smells at breakup; it’s natural; rotting vegetation.

Kirt Sellers

- this is a natural process, not to be confused with the question of pollution.

??

- Does the WMA have any say in how the CPR operates? E.g. filling in marshes while maintaining rail bed.

Jerry ?

- It’s a question of whether they are operating properly (i.e. according to environmental requirements). There is also a problem of control of noxious weeds along the tracks.

Kirt Sellers

- These issues need to be addressed as does the effect of noise from the trains on wildlife.

Ian Adams

- What is the history of flora and fauna on the alluvial fans (to guide

management)?

Gwenis Snow ?

- Does the CPR have land that they will be selling?
- expressed concern re the impact of coal dust with the very large number of trains (26/day).

BJ & DP

- discussed the relative impacts of regular vs sporadic “disturbance”: animals habituate to regular disturbance.

DP

- CPR is private land, not within the WMA.

Bob Campsell

- we (the community and managers) need to think in the long-term and view the Columbia River from a global perspective. It is very small and fragile on a global scale, but the ecological and biodiversity values are much larger than its size suggests. Therefore, it is important to keep the wetlands as they are.

Mike Polombo

- felt it is ludicrous to compare the effects of “one boat” with that of the CPR. We should be asking, “What are we going to do about the CPR?”

??

- has cross-country skied between Invermere and Golden and seen hundreds of deer. He felt that the deer experienced great stress just from the disturbance he created as a skier.

??

- should also consider the impacts of Brisco Wood Preservers.

BJ

- asked the audience to offer ideas about *how much* of the various recreational activities should be allowed.

??

- Must involve the CPR in how the WMA is managed: matters of pollution, weeds, and quality of life for the people of the valley.

Don Hasset

- but must also consider what CPR means to the economy: jobs, etc.

Barry Whiting

- Trains have a very great impact on wildlife in Parks (wildlife killed on tracks).
- but economy is also important.
- We can't do much about the CPR, but we can do something about “prop wash”.

Don Saebler

- The Columbia River is a heritage site, or has heritage sites along its length. Sternwheelers are a part of that history. Should consider the impact of the 10 hp reg on the potential to recognize that heritage through reconstruction and use of a sternwheeler.

Dennis ?

- question re nature of the Order-in-Council that established the 10 hp reg.

DP

- defined "legislation" vs "regulations" and "Order-in-Council". The 10 hp reg is a "order" pursuant to the Wildlife Act

Dennis ?

- the Invermere town council was "really after the jet-skis."

??

- What was the ecological basis for the 10 hp limit?

??

- If you can't regulate jet-skis separately from outboards, how can you say that one size of motor has different effects than another?

DP

- A regulation involving the size of the motor can be uniformly applied.

Dean Kupchanko

- The restriction was decided *for* us (no input); what was the basis for the decision?

Darryl Wilder

- 40 years on the river; ran tours in the 60's.
- Sees the reg as unconstitutional and the act of a public servant after power.
- The process of deciding such a regulation should *start* with the public meetings.
- The river is not part of the wetlands.
- Trains are a much greater disturbance than boats.

Doug Sinclair

- runs river tours; income was eliminated with imposition of the 10 hp limit.
- river and wetlands should be considered separately.
- the levels of use to date have virtually no impact.
- motor size is an inappropriate form of regulation; should be boat speed..
- use navigational rules and common courtesy to control impact.

Gail Berg

- Why horsepower, not speed regulation?

DP

- Speed was the first option looked at, but is virtually unenforceable.
- Very difficult to separate wetland from river (in terms of a regulation re operation of motors).

Jaqueline Fisnell

- How have the written responses to the reg balanced out?

DP

- faxes, letters, petitions - from Alberta to Vancouver - about 50:50 pro and con.

Darryl Wilder

- natives are going to seed wild rice in the wetlands; how are you going to deal with that?

Bob Campsell

- most people want some form of protection for the wetlands.

BJ

- described how recreational raft use of the Colorado River - 18,000 visitors per year - is controlled. Suggested we need to look for those kinds of solutions for the Columbia.

Jaqueline Fisnell

- but different ecosystem and different impacts.

??

- There is a tremendous amount of economic development going on in the valley. We need to establish sound guidelines now.

Doug Sinclair

- Whether it's canoe or outboard, there is always some impact.

??

- Those who use large motors and jet-skis are not out there to appreciate nature, and they don't care about wildlife disturbance.

??

- recommended responsible use by permit.

Don Hasset

- More damage is done by pollution than by boaters.

Darryl Wilder

- The river should be considered separate from the wetlands.
- Allow larger motors on the river.
- Don't allow *any* motors or jet-skis on the wetlands.

- Jet skis don't bother waterfowl.
- Put up signs along the river.
- 10 hp is not large enough motor to navigate river.

Chris White

- rents personal water craft at Invermere.
- jet-skis won't operate in wetlands.
- there *are* irresponsible operators; education is needed.

Bill Swan

- To protect the area's wildlife, we need to start with conservative regulations. MELP used a "blunt instrument" to ensure protection and because the reg had to be enforceable.

??

- What will constitute a "crisis" in the WMA?; i.e. how do we know when significant damaging changes are taking place?

John Duthie

- owns and operates jet boat on the Columbia River.
- obtained and reviewed literature regarding boating disturbance.
- The Columbia River is cold and turbid and supports small numbers of wildlife on the river proper vs. the very productive wetlands.
- concluded he could operate his boat on the river as long as he respects the reality of the ecosystem.
- the question is one of the number of operators: too many people means disturbance of wildlife and impacts the experience of others on the river.
- There are about 20 operators on the river now. In 4 trips between Athalmer and Radium, he encountered 25 canoes, 10 - 12 jet skis, and 0 river boats.
- Education is required (see Idaho brochure on safety and use of jet skis).

Dwayne Crandell

- No one wants the wildlife to be stressed or reduced in numbers; they are our assets. But a multiple-use concept should apply.
- There has been little change in the valley in the past 40 years. We've done a pretty good job of protecting the wetlands. But we must also create wealth to look after these assets.
- Sees Columbia River as a "wasted resource"
- takes offense at the way the 10 hp reg was enacted and feels the province was out of line in establishing the regulation.

BJ

- asked how the audience felt about a local advisory / educator group to promote self-regulation and personal responsibility.

??

- there is difference [ecologically and in terms of management] between the river and the wetlands. Volunteers could mark the river channel so that the wetlands

would not be disturbed by boaters.

Dennis ?

- There is too much concern regarding the impacts of disturbance on wildlife. Birds are resilient.
- People will police themselves; signs are not necessary.

Joyce Jack

- has been canoeing in the Columbia River for 26 years. This year was first encounter with jet skis. The serenity of the experience was lost. You won't be able to enforce speed restrictions.

Grammit ?

- The 10 hp reg is too simple for such a complex system.
- You can't separate the river from the wetlands and you can't mark off the river.
- Should deal with the bigger issue of the CPR.
- 15 ac (Lot 1) at Athalmer should be in WMA.

??

- would have liked this meeting to address issues other than the 10 hp regulation

Carl Brouse?

- The 10 hp regulation is adequate; has to be a limit.

? Mrs. Brouse?

- lived on a lake in Austria where all kinds of watercraft were allowed. Within 20 years there was no fish or wildlife. Boats were then banned and the lake is recovering. There is now very limited boating use of the lake.

??

- What opportunity will there be in future for input to management of the area?

Glennis Snow

- mentioned Columbia River Trust; she is on Advisory Committee. Opportunities for funding of enhancement activities.

Dean Kupchanko

- "moved" that the 10 hp reg be rescinded until appropriate data can be gathered to establish a satisfactory regulation.

DP

- countered that reg would be retained and data should be gathered to derive a satisfactory regulation.

**GOLDEN
PUBLIC MEETING**
November 13, 1997

In addition to about 115 interested residents of the valley, this meeting was attended by Jon Churchill, Shawn Payne, and Collin Michael of the federal Coast Guard, and Joe Walsh of the Golden Star newspaper.

Tom Sime

- CORE recognized the area from Canal Flats to Donald as the game management area. Why is Lake Windermere not included in the WMA?

DP

- Lake Windermere was never considered part of the WMA.

??

- Is there any information on the status of wildlife before and after historic dredging of the Columbia River?

BJ

- No.

Bill ?

- Is the area between Columbia Lake and Lake Windermere part of the WMA?

BJ

- A portion of the area which is Crown Land.

Bill ?

- The question is really about being able to boat in Columbia Lake and Lake Windermere but not around Golden.

Dwayne Crandell

- The discussion tonight is likely to center on the 10 hp issue; people commenting should make their position on that very clear.

- Concern should be on how the order was implemented.

- There is not a "crisis" in the wetlands at this point in time; little has changed in the last 30 - 50 years.

- asked Coast Guard to address the 10 hp reg.

- There has been no significant damage to Mulligan Slough from water skiing.

- Recommends larger motors be allowed on the Columbia River and "traditional" uses, such as water skiing on Mulligan Slough be retained.

- Wants to retain natural values of the wetlands.

Bob Campsell

- What are the license requirements for tour operators?

BJ

- Back-Country Recreation license from Min. Of Lands. Requires plan / proposal.
- Because there is so much of this activity, they're considering a system whereby licensing is required only when a certain level of activity (by a given operator) is reached.

Doug Holt ?

- Sees more wildlife now than ever before; therefore, motors are not a problem.
- A blanket restriction on motors is not acceptable.
- The numbers of visitors being projected for the area is unreal [not realistic].

??

- Are there any species that have been extirpated from the wetlands?
- How are loons doing?

Jon Churchill

- The regulation of boat traffic on the Columbia River is a federal matter.

??

- Then should the 10 hp regulation be a federal or provincial decision?

Jon Churchill

- Federal.

DP

- issue between province and federal government that the lawyers will have to decide.

??

- Wanted this to be an informational meeting [not a dispute of the 10 hp reg].

Glennis Snow

- Many people at the Invermere meeting were frustrated because of the focus on the 10 hp issue.

??

- How are flood control issues going to be handled within the context of the WMA? E.g. impact of the deposits of the Kickinghorse River on the levels of the Columbia River at Golden.

DP

- WMA will not affect municipal decisions re dyking / flood protection.

Bob Lecky ?

- operates Golf Club and RV Park. Put up swallow nests and in 1st year got 50% occupancy. This year WCB came along and knocked down about 2000 good wildlife trees, including those with the swallow boxes!

Chuck Kochura

- There is a huge bureaucracy involved in getting approvals for recreational use of the wetlands. Suggests better handled by self-regulation as were the 3000 users guided on the Kickinghorse this year.

??

- expressed support for the quiet enjoyment (solitude) of the wetlands.

John ?

- doesn't feel that machines drive wildlife away. E.g. Reflection Lake. But canoes can disturb wildlife.

Doug Adama

- Boats do cause disturbance.

Ellen Zimmerman

- "shy" species do not use Reflection Lake.

Mary Paulsen

- "sick and tired" of bureaucrats wanting to preserve this area as a Park.
- If you're going to control motor boats, keep the canoes out, too; they also have an impact.

Mary Ann Emery ?

- canoeist
- The area should be maintained *for wildlife*.
- All of us have an impact; more than we realize.
- Our mentality must change; we need to use the results of studies of disturbance as a basis for how we use the wetlands.

??

- The Columbia River Wetlands do not support duck nests. The regulation does not have adequate support.
- These wetlands could have been good farmland (with dyking) but the government prevented that.

BJ and Ed Hennan

- described the nature of use of the wetlands by nesting ducks.

Cathy Green

- Where did the 10 hp reg come from and who has jurisdiction? What is the purpose of the regulation?

Barry Whiting

- Is the province limiting navigation with this reg.?

Jon Churchill

- Yes. Coast Guard must work this out with provincial gov't.

DP

- The 10 hp reg is in effect.

??

- Will there be a public process in resolving this issue of the 10 hp limit?

??

- What about snowmobiling on the river (i.e. frozen water)?

Jon Churchill

- Coast Guard not concerned with that.

Cy Page ?

- How does Coast Guard control boat use?

Jon Churchill

- By regulating speed.

??

- Motor size is not appropriate; rather, speed and timing of boating activity.

Wayne ?

- The demand for recreational activities in the Golden area is going to grow explosively (c.f. ski hill). While we need to accommodate some recreational use of the wetlands, we must decide *now* on how to control that use.

- hotel beds in Golden have doubled in three years.

Bob Campsell

- We should be very concerned about the future. People are the problem and must provide the solution. The landscape is changing: filling in with development. Many other "large" wetlands have already been lost - but it happened a little bit at a time..

??

- What are the residents of the valley going to do that will "destroy" the wetlands?

Mike Polumbo

- The lack of a consultation process is the major issue.
- Common sense suggests that current and potential use of the wetlands has / will have no impact.
- If a commercial user can be licensed to use the wetlands, why can't Joe Citizen?
- A 10 hp motor is inadequate for the river and can't be used [won't work] in the wetlands.

??

- Elk do more damage to the wetlands than people. Whatever we do has an impact; we have to be sensible.

Julia Cunliffe ?

- Appreciates the values of the wetlands.
- Need to look to the future and the potential use and impacts.

Cy Page ?

- Hopes managers can substantiate regulations such as the 10 hp limit. Should throw it out until we can back it up.

BJ

- reviewed some options discussed at Invermere
- 10 hp limit offers simplicity of enforcement
- speed is very difficult to enforce
- allow larger motors on the main river channel
- time-staggered one-way travel
- need for manager on site.

Barry Whiting

- doesn't want endless studies. Mentioned party mist-netting birds in the area last summer; seemed repetitive and uncoordinated with another mist-netting study that had been done.

DP

- the Management Plan will include guidelines for research activities and the MELP will have a screening process for research proposals in the WMA

Don Hasset

- Clears off ice on a pond for ice-skating at Brisco. Is this having an impact?

EH

- No, not likely; but it's really a question of *how much* of any activity that is of concern in management of the area.

Erin Graham ?

- These wetlands are a North American legacy. The number of recreationists is going to grow. We must prepare for that. Hopes federal and provincial gov'ts can resolve jurisdictional issues.

Cy Page

- Suggests self-regulation of recreationists through local associations

Barry Huebert

- rancher
- against the 10 hp regulation
- not concerned with solitude
- *wants* people on the wetlands, but with self-regulation.

Wayne Houlbrook

- Kinbasket Adventures (tours)
- uses 2 - 3 hp electric and 6 hp gas motors; goes upstream.
- must protect wildlife, but 10 hp limit is not the real answer
- should look more to CPR and the impacts it has
- address all issues, e.g. 2-stroke vs 4-stroke engines.
- educate public
- organized snowmobilers do not do damage; they are responsible recreationists
- what studies have been done to substantiate their impacts?
- canoeists and cross-country skiers are just as much a concern as snowmobiles and outboard motors.
- should deal with those who abuse the privilege of using the resource.

??

- from Surrey
- the area hasn't changed over the years; the animals are doing very well.
- only severe development will destroy wildlife.

BRISCO
PUBLIC MEETING
November 14, 1997

The Brisco meeting was attended by about 40 people. Bob Jamieson made the presentation on his own for this meeting, so no detailed notes could be taken. The major points made during the meeting were similar to those expressed in the other two meetings on the 10 HP issue. There was a concern expressed that the larger communities at either end of the wetlands would get what they wanted in terms of access to the wetlands, perhaps at the expense of people living in smaller communities in the mid-section of the wetlands.

Several people who have lived on the wetlands for most of their lives were at this meeting. Their presence lead to a discussion of the ecological history of the wetlands and the impact of the dredging done for the stern-wheelers that used the river channel from the 1910's to 1950's. The dredging sufficiently changed the water regime in many of the sege meadows that many of them were hayed for many years. These same areas are now wet for most of the year, probably since the channel is now filled in and the water table is higher for most of the year.

RECORD OF COMMENTS FROM GROUPS AND INDIVIDUALS CONSULTED (Other than at the public meetings)

Included below are brief notes on the discussions we had with a variety of individuals and groups during the process.

K'tunaxa Tribal Council -Resource Mgmt Section and Elders Jan.16.

major concern about the vandalism of native heritage sites, primarily on Columbia Lake. Sites are protected by Heritage Act but the act is not enforced.

Can CO's enforce Heritage Act? Could be a role for river keepers

Joint stewardship is an objective for the council

Commercial tours, such as a mtn bike company using the east side of Columbia Lake, were a concern in relation to their impact on native sites.

Campsites on the Col. River could have an impact on native sites.

Concern over the promotion of use of the area.

Concern over the impact of the 10 HP regulation on traditional use with older people or others using larger motors to access the area.

½ of the river channel above and below Windermere Lake at the two reserves is in fact native land.

Council has GIS capability

concern over lack of real consultation

old reserve lands at Toby Creek?

Salmon River (Dunbar or Templton Creek) was a major salmon spawning area and some of the drying racks are still visible. There is an option for protecting these sites using conservation easements.

Cooperative research project in the wetlands.

There is an need to check the condition of sites on the river. This could be done in cooperation with the project proposed in the plan for charting the ecological history of the wetlands, to provide baseline data for the management plan and as a source of material for interpreting the wetlands. The CBT/CBFWCP agreement and the Living Landscapes Program (CBT/Royal BC Museum) would likely be willing to fund this in the form of project titled "The living history of the Columbia Wetlands".

Joint stewardship

Some new form of stewardship for the wetlands may provide some opportunities for the Tribal Council, the Wildlife Branch and the public. A river stewardship program could be developed that would include local recreational users, trappers, outfitters, tourism operators and native people, working together to monitor reaches of the river. They would work with the Wildlife Branch and the K'tunaxa Tribal Council (or the local bands) to assist in protecting wildlife, fisheries, landscape and heritage values.

There is tension between first nations acting as a "government"; their desire to work with other people in the community, and the interest of the larger public in stewardship that would have to be considered.

This could look like a local person interested in the wetlands, a local Conservation Officer, and a native person patrolling the river, creating friendships and protecting fisheries, wildlife and heritage resources. They could report problems, talk to people on the river and explain issues and concerns, and give visitors and users a different sense of the river. There is also an option of putting up a sign indicating the limitations on use of the river that would be jointly signed by MELP and the K'tunaxa Tribal Council and/or the local band. **This could be a positive and low risk way of testing the "joint stewardship" concept.**

Columbia Valley Field Naturalists Jan 6/98.

Bill Swan and 8-9 others, about half had been to the public meetings.

Good discussion of paleo-ecology of the area.

Contact with Blair Blackney whose father was a captain on stern-wheelers suggested doing marsh core to check for presence of cottonwood ref. on historic fire - photos at museum.

Invermere and Golden museums, also Ottawa archives for Dawson photos
CPR archives?

CPR-concern over pollution from former employees

grease boxes and burning grease and grease bags
used to dump ties into wetlands

Brian Lyle at Panorama has contacts in upper levels of CPR.

Darryl Smith at Calgary has done work on dynamics of wetland-UofC.

CWS has indicated that the benchland lakes are important nesting sites

CWS apparently has a lease on some of Tresher's land at Brisco to retain grassland for nesting.

Overflow of the sewage plants at Radium and for the Radium Resort have been concerns in the past.

Fed. of Ontario Naturalists run a canoe trip annually through the wetlands.

Mosquito control issue?

There used to be the Kootenay Hunting Lodge at Brisco, just for duck hunters 30 years ago, present use is away down

Birds over the Rockies committee have set up a Project Wetlands fund for supporting work in the wetlands. \$5,000.00 to date.

Indicated a need to be explicit about how principles apply to comm. Tourism

refer. Bioterrain assessment at radium

need to address education issues

Golden Rod and Gun Club Dec. 9

Presentation was given on Bears and Birds festival

Francis King-bird records from Nichol森

presentation by Bob Ferguson on 12 mile elk herd and burning

collected some comment sheets

John Duthie Dec. 7

Col. River Preservation Society

interested in river keepers concept that would include brochures and signage on the river.

Assuming that they would be working with the coast guard.

He has talked to the CBT concerning funding

Proposed idea of running traffic in a single direction where the channel is split to reduce conflicts.

There are two channels in several areas for Radium to Edgewater and from Brisco to Parsons.

Dec. 3. EKES meeting

Ellen Zimmerman, John Bershenske, Trevor Kinley, Jacqueline Bissounett, Peter Holmes, Bob Campsal, Dave Phelps, Bob Ferguson, Doug Adama, Allen Dibb, Ian Adams.

Natural Processes should be allowed to occur except to protect private land change in channel since D. Thompson (river used to run by the old fort site)

enhancement should be a response to specific species problems only

check hydrology of Horsethief to see if it is a concern

did dredging actually occur along the whole length of the channel?

possible shift in high water period

recruitment vs mortality in Cottonwood stands

FS is responsible for fire-fighting unless directed otherwise by a management plan.

There are the only protected CT systems in Columbia system except CVWMA.

Opposed to DU style projects for any species

Restoration should occur when the factor causing the species decline is local habitat change and not an external factor (climate change)

Is the wood in the WMA included in the AAC calculation?

Mgmt principle- All actions in the WMA must have a positive or neutral impact on wildlife (and/or wilderness values??)

leave alluvial areas alone, do enhancement in adjacent areas

retain older forests where possible

replacing element in the system-if CT are being removed on private land and are in decline in the wetlands, then put up nest boxes... CT is in decline throughout basin, so..???

wants permits for commercial uses, not area based tenures.

want very conservative levels of commercial use

no stern-wheeler use

Golden-range permits in wetlands -check Fefenroth

no new grazing permits

public invol.- referalls for CBR proposals and major mgnt decisions

need public fail-safe

Nov. 31. Eric Rasmansen 342-6349

Goose goslings are killed on tracks. Should build platforms or sandbars above the level of high water in the mid-botts channel area.

Move goose nesting platforms away from heron rookery sites. check with ed.

Buster Tegart had beaver populations down in Brisco area. Jim Stone and Jack McKill brought in 2 pairs from Banff and released them there. They were common in other areas.

1/4 mi. south of the Brisco Mill there is a place where the river may break through the levee and into the pond adjacent to the mill. Should we fix it? (below Brisco Hall)

Large, deep ponds between Luxor and Brisco could be damned to stabilize water levels. Little plant life in those ponds.

Nov. 31. Peter Feldmann

grazing 50 ha of wetland at the base of Bugaboo Creek. He leases private land north of the river also. Grazes for two weeks in the fall. Sedge and willow site between river and Botts Channel. Some cottonwood and aspen along edge, spruce/df on toe of slope (80 ac. of private). Would like to apply next fall for a burn through range enh. fund and CBFWCP. Will have minor wildlife impacts, or benefits, if Cottonwood are protected. Small cat could build fire guard, burn by hand. Will probably need to walk down large willow clumps to have any real impact. The only impact of cattle in Nov. 97 was trailing in wet portions.

Nov. 31. Mary Yaterniak 344-0103

Mary would like to donate 12 ac. of Lot 9005 (160ac) to the crown or Nature Conservancy to become part of the wetlands WMA. She would like to see hunting closed on this small wetland. She is checking with her kids. Suzette Dumphie (daughter) is selling 135 ac in the wetlands just to the south (Dunphie B/B).

Fred Franchuk may also own a portion of the wetland (L11327). Blk A, 28T249 is private to the west and north. The north end of that lot shows a public access to the river (undeveloped). Rev. Scorts from California owns 8 ac. In the same area.

Trappers are Art Galbraith (south of Spill. bridge), Mary (Spill. bridge north), Irvin Heinz, then Dave Brock.

Nov. 20. Irv Graham -phone 344-5863

runs a bed and breakfast across the river at Golden/Nicholsen is working on promoting Golden as a tourism area and developing a Golden to Invermere corridor with bird viewing and recreation sites along the way. Concerned about public access to the wetlands. Considering canoe rentals from his b/b in the future.

Nov. 14 Mike Polumbo - Col. Awareness Group

talked to on the day of the Golden Pubic meeting does not have a commercial interest in the area, does not sell a lot of sea-doods.

Oct. 20 Rocky Mtn Naturalists

support for DU style projects
support for 10 HP reg.

Oct. 20 Larry Ingham CBFWCP:

edgewater access- station road by school - to river channel
outfitter carmen dempsey - hunt marshes with small motor
ungulates use levees, 60% of use is on fans
move to benches late in winter (feb.)

Oct. 20. Don Seable

owner-manager of Fairmont Hot Springs Resort
supports 10 HP restriction
impact on banks- water turns mirky on clay banks
Henry's raft - pontoon boat - for observing area/education/
support speed limit
loud noises and wake are offensive
need to select for people who enjoy the wetlands and appreciate their value

Oct. 20. Glenn Findlay - Columbia Rafting Tours - 345-6155

They use the portion of the river from just south of Columbia Lake (Rock Bluff) down through Fairmont to the sub-division below Fairmont. This portion of the river is not in the WMA. They have been operating for 4 years. The majority of their trips are on Toby Creek.

Oct. 15. Glen Killens - Kimberley Wildlife and Wilderness Club

supports 10HP regulation
concern over nesting birds

Oct. 9. Doug Sinclair - Rocky Mtn Riverboat Co.

Box 228, Windermere VOB 2LO
342-8338

-jet boat tours - \$40.00 per, 8 passengers
runs Kootenay River, also from Invermere up to Fairmont and Athalmer down to Edgewater, 1 day and half day trips
has been operating for three years, 2-3 trips per week
floats down, jets back up, obj. is to show people wildlife and get away from noise and activity of Invermere in summer
the railway bridge at Wilmer is too low to get under for June and July, thus restricts use from Athalmer.
Says events with jet skis are overblown. He has seen only a few jet-skis on the river.
CWS should mark the NWA from the river.
Three other people have jet boats in Invermere, Doug Brehland, John Duffie and Dean Kupchenko.

Oct. 7 Lake Windermere and District Farmer's Institute

Bob Coy-345-6572

Several ranchers use crown portions of the wetlands, usually in the fall
Dennis Tegart- on Kirk property, presumably using private portions
Jamie Brown - Bryndon Creek unit.
Plotts Pasture at Brisco -fish Lake unit.
Peter Feldman -using land in wetlands
geese-1-200 in fields and 7 sandhill cranes

later opening? now Sept. 10.
ducks are nesting in haylands, not in wetlands
how are we going to police ski-doo activity?
identify use areas in wetlands
letter send to D. MacDonald on process

Oct. 7. Gail Berg

Gene Garbowski at Forster Creek has 160 AUMS used for wintering horses on crown.
Albert Cooper has a permit for the CWS lands at Wilmer.
UREP area at the south end of Windermere Lake is used by 3-4 operators as part of lease agreement with Hofert lands grazing. New owners, so the future is uncertain.
There is a major problem in that area with quads, motor-cycles and 4x4s, from Calgary.
Area is IDFun, on lacustrine deposits which are saline in areas. There are some red-listed species present there although little work has been done. *Townsendia perryi*- a low growing aster has been seen there.
Similar habitat is protected in CWS area at Wilmer.

Oct. 8. Mary Yatarniak

access at spill. bridge has been wrecked by new bridge construction
vegetation hasn't changed substantially over last 60 years
used to be many more muskrats, used to kill 2-300 per year
disease is reason for low numbers
mink kill lots of muskrat young
has killed two otter in last few years

Oct. 3. Jon Shepherd - Lepidopterist - 352-3028

leave wetlands and water levels alone so species present are maintained
x whitehouse studied dragon flies in the wetlands in 60's -resident in cranbk

Oct. 1 Larry Halverson

clay cliffs -edgewater- identify swallow sites
old df- north of radium - red rock road behind Steam boat Mtn.
letter from CWS and NP concerning 10 HP reg.-support

Sep. 18 -meeting of Lake Windermere District Rod and Gun Club

Bill Hendrikson - water-skiing buoys in Windermere Lake 427-7217
trapper-Kat MacIntosh-Athlmer to Radium
most bird hunting takes place in Mud and Tatley Lakes, not at the end of Windermere Lake.
Hunting should continue as traditional use, as indicated in CORE Table agreement.
Concern that no hunting areas within marshes will create problems with present cooperation between environmental and hunting interests in the valley.
goose nests-150, 100 still in good condition. They have limited further construction of boxes due to farmer's concerns.
"as little development of any kind as is possible"

"keep natural with low levels of use"
support for 10Hp restriction
established camps in the wetlands would not be supported-local impacts
consider critical times for wildlife

Sep. 23 John Duthie - 403-650-9251
running jet boats for 12 years on the river

Sep. 18 - Gourmet Brar - 342-2294

Lot 1, Plan 18817 is one of three crown parcels in Athalmer that have been part of a long standing local debate. The other two parcels have been sold to private interests by BC Lands, for development. Several local people are adamant that this final lot should remain as wetland and should not be sold or developed. They see the idea of a wetland interpretative center on these lands as a ploy for development of the site. The three parcels were apparently is some kind of protective status for wildlife up to the 1980's.

Sep. 15 Rod Drown - 344-2353

representing proponents in dealings with government
hovercraft - trips -6 person-\$40,000.00
logging contractor at 62, lost his job at Evans
looking at hauling logging crews, rescue
suggested using lower part of the river
2 others interested in Golden
new age teepee camp-on edge of wetlands- north of Blaeberry confl. on west side within the WMA -have applied to Lands for permit. Access via raft down Blaeberry

steamboat business- European style - 20 feet-12 people, environmentally -low impact, low fuel consumption, low noise. Would go down from golf course to site on back channel, then loop through main channel and back to golden
-in future

Sept 9. Les MacDonald

Invermere community sewage system -located on Toby Creek
secondary treatment- adjacent to river
no oxygen demand, slime problem in fall in 70's
amononia -in the ground water, not found in river
Windermere shoreline - ground disposal systems but soils are good for this use
some sub-divisions on tile fields
80's- studies- some outflow areas into lake
diffuse inputs into lake
generally found low impact on water quality
30 days water residence time-short in Windermere Lake, due to shallowness of lake
no accumulution of nutrients in lake
thus can tolerate higher phosphorous levels without algae bloom
outflow- export of nutrients - 85 report available at the EK health unit
subbasin water quality assessment-Makeen and nardeen 85
no problem - no trends

lake is water supply -
major concern is considerable geological hazard
change flow patterns, no storm sewers
no serious effect on water quality, turbidity and silt in water are normal in river
magnesium and calcium and sulphate- gypsum mine and hot spring
mines in Toby ck- contamination on site with cadmium and lead, no evidence in creek or
ground water
spill. mine?-not known
barite mine- not mobilized so not a concern

Sept. 5 - G. Richardson

concerned with pollution impacts on Col. River
sewage and impact of 19 gold courses
discussed TFL boundary
lot lines (high survey costs)
real issue is forest management adjacent to the wetland, not the boundary
drop in river against elevation

Sep. 5. Wayne Halbrook 344-6012 kbasket\@rockies.net

raft 20 ft. long, has been operating for 11 years uses 2-3 HP elec. motor
runs trips from Nichol森 bridge to the airport at Golden
geese nesting in heron rookeries and osprey nests
5 nest to one-osprey nest taken over by geese
36 to 7 nests due to geese and beaver
wire all trees in rookeries
rookery moved close to CPR yard
asked for end to putting up goose nests
beaver and wind have knocked down alot of nest trees, including
2 Great Horned Owl nests
15 Hp needed to go upstream
too many operators
other tours
 Jack Wilson-campground
 running upstream fro Golden with 30 Hp boat
 Mekum Rosenburg

Sep. 5 George McClarin

Wet 'n'Wild - Kayak Adventures
ATVs and sea kayaks - 344-6546
 800-668-9119
-lodge and white water on highway above Golden
-6 kayaks-low volume
-runs from Nichol森 to Golden
-considering longer trips from Invermere
-concern over 10HP - should leave river open from Golden to Donald
to jet boats and larger motors
no lakes close to town
consider seasonal or area closure

Sep. 5 Eco-excursions - Gary Pearson 888-210-2211

344-5060

344-2266-ho

Box 1990, golden, VOQ 1HO

larger boat as in brochure

operating for 4 yrs

lives on land on wetland

runs from McMurdo to Horse Creek

used 40 Hp to come back up river

willing to change

rookery at 10 miles used by herons, then taken over by geese

uses motor for fishing and hunting

one commercial air boat being considered

boats rather than person days should be a measure of disturbance

Sep. 5 Columbia Valley Lodge

issue of ownership of lake bottom

Sep. 5 Wells Landing B&B

trail setting machine for Jack Rabbit ski club on Hog Ranch channel

Jack Soles-old timer with snow machine

water lily displays- value of aetetics

Sep. 5 Bob Ferguson 344-7633

doing work on burn

elk are using equisteum over sedge and willow

major impact on cottonwood-resprouting

willow and alder fly catcher-common

Mulligan Lake- boaters

Aug. 31. Eric Rasmensen -342-6349

wildlife viewing group at Radium -Radium Wetlands Society

trail on 50 ac. of private below gold course

trail there and on crown across the river

permission from lands for trail for wings over rockies

plan for board walks

Dikes - dikes work north of Spillamacheen, not to south due to gravel seams and type of silt.

old dikes built at Horsethief-Forester site for farmland, did not hold water out

his father built a control structure on a 100 ac slough at Brisco in 1930 to 46. To improve conditions for muskrats, took 500 per year. Old houses benefited ducks and geese.

there is a 50's soil report available (Holland and Holland?)

there was an proposal to dike the entire wetlands by Hansen in the 50's to grow sugar beets. Some soils info may be available in relation to that.

pilings were used along the river, with 2x12s between to direct the current and maintain a channel for the stern-wheelers

In 1940's the river was used to run logs down to a mill at Parsons

Thinking about heritage river status

Complete list of those contacted. *(Dave, is this needed?)*
(not completed)

Land Owners

Windermere Farmer's Institute-Tresher/Bob Coy-345-6572
Golden Farmer's Institute - Rudi Gertsch -344-2485
Shuswap Band Council - Dean Martin - 342-6361
Columbia Lake Band Council - Joe Nicholas-342-6301
Chuck Kochura
Hoffert property owners-??-Zinder

Tourism operations

Fairmont Hotsprings Resort-Don Sabel/Carol
Pete's Marina -boat rentals agencies on Windermere Lake
Doug Sinclair -Rocky Mtn Riverboat Co.
Box 228, Windermere VOB 2LO
342-8338
-jet boat tours

Dave Fountain, box 1797,, Golden
Motor cycle tours- 344-5084/800-303-0733
rocky mtn trail rides (weetland tours) -
no phone

Timber Inn -lodge of wetlands
at parsons -348-2228

Wayne Halbrook 344-6012
-raft 20 ft. -
11 years - 2-3 HP elec. motor
gone sept 9-Oct. - guiding
kbasket\@rockies.net

Eco-excursions - Gary Pearson
888-210-2211
344-5060
344-2266-ho
Box 1990, golden, VOQ 1HO
larger boat as in brochure
called

George McClarin
Wet 'n'Wild - Kayak Adventures
ATVs and sea kayaks - 344-6546

800-668-9119

Rod Drown - 344-2353

2 clients interested in moorage in river
new age camp-on edge of wetlands- north of Blaeberry confl.
steamboat business-
hovercraft - trips -

Commercial Operations

Outfitters in the area- Jim Tegart, Cody
Spillamacheen, Wolfendins
trappers

Industrial

CPR -Roger Doublewitez- 342-5370
Slocan Forest Products, Radium Hot Springs Mill- Steve Ostlander
Forest companies in Golden and small mills in the area- forester?
Crestbrook Forest Industries (G. Richardson, manager of TFL #14 and others at the Canal
Flats office)
348-2211

Interest groups

Kat Hartwig-EKES
Ellen zimmerman-EKES Golden
Windermere and District Rod and Gun Club
Golden Rod and Gun Club
East Kootenay Wildlife Association- George Wilson

Columbia River Awareness Group -mike Polombo
tom syne - 344-5578
bob sime -344-6658
cal-6978

The "Birds over the Rockies" organization- Larry
Larry Halverson and other naturalists in the area
Bill Swan - Field naturalists
Land Trust Groups for the Hoffert and Kirkland properties

Government and quasi-government organizations

Canadian Wildlife Service- Delta
Parks Canada (Kootenay and Yoho National Parks)Larry, Al Dibb-Peterson
Coast Guard

Wildlife Branch staff
Provincial Parks staff- Mike Gall

Fisheries Branch staff- Bill Westover
Water Rights Branch in MELP-?
Lands Division staff in MELP-? Herb
Columbia Basin Fish and Wildlife Compensation Program staff

antifeau

sid canning, leah ramsay - 387-6250

george douglas and penny-botanist

Gail Berg- range maps and use areas
Jim doyle

CO's Ric Hoare - 342-4266

K'tunaxa Tribal Council -Tom

Consultants

Nancy Newhouse and Trevor Findlay - Sylvan Consultants,
Bob Ferguson 344-7633 -bird species by habitat
Ian adams - canal flats

Individuals

Marie- 345-6355
Eric Rasmensen -342-6349
Peter C.
Glennis Snow

Other Agencies

Ducks Unlimited- d. klausen - 6-0871 Jim 428-4869
Nature Conservancy of Canada
Nature Trust of B.C.

Malheur NWF (541-493-2612)

Gary Ivy- senior biologist
gary_Ivey@mail.fws.gov

LIST OF COMMERCIAL OPERATORS IN THE COLUMBIA WETLANDS WMA.

I have listed below the commercial tourism operators using the Columbia Wetlands.

PRESENTLY LICENSED OPERATORS

Trappers: This information is available in MELP files.

Outfitters: This information is available in MELP files. I am aware of only one outfitter that actually uses the wetlands (Dempsey).

Nature tour operators: It is my understanding that **Wayne Houlbrook** (344-6012) is the only other licensed operator, since he uses a rubber raft.

PRESENTLY OPERATING BUT UNLICENSED OPERATORS

Doug Sinclair - Rocky Mtn Riverboat Co.(342-8338) - Operating jet-boat tours out of Invermere.

Gary Pearson - Eco-excursions (344-5060) - Operating nature tours with a pontoon boat out of Golden.

George McClarin -Wet 'n'Wild Kayak Adventures (344-6546) - Operating occasional kayak trips in the wetlands.

POTENTIAL OPERATORS

I have talked to some individuals who have plans to begin operations in the next two years.

Irv Graham (344-5863) - runs a B/B at Parsons, plans to rent canoes for use in the wetlands.

Rod Drown - (344-2353) - Rod represents three people who are considering setting up operations in the WMA, a hovercraft tour operator, a steamboat operator and a group wishing to set up a teepee camp near the Blaeberry.

I have included below my notes on my discussions with each of these individuals or operators.

PRESENTLY LICENSED OPERATORS

Sep. 5. Wayne Houlbrook - Kinbasket Adventures -(344-6012) kbasket\@rockies.net
raft 20 ft. long, has been operating for 11 years uses 2-3 HP elec. motor
runs trips from Nicholzen bridge to the airport at Golden
geese nesting in heron rookies and osprey nests
15 Hp needed to go upstream
too many operators

other tours he knows of:

Jack Wilson-campground owner, is running upstream from Golden with 30 Hp boat
Mekum Rosenburg- (not contracted)

PRESENTLY OPERATING BUT UNLICENSED OPERATORS

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-jet boat tours - \$40.00 per, 8 passengers

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floats down, jets back up, obj. is to show people wildlife and get away from noise and activity of Invermere in summer

the railway bridge at Wilmer is too low to get under for June and July, thus restricts use from Athalmer.

Says events with jet skis are overblown. He has seen only a few jet-skiis on the river.

CWS should mark the NWA from the river.

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1. hovercraft - trips -6 person-\$40,000.00
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looking at hauling logging crews, rescue
suggested using lower part of the river
two others interested in Golden
2. New age teepee camp-on edge of wetlands- north of Blaeberry confl. on west side
within the WMA -have applied to Lands for permit. Access via raft down Blaeberry
3. Steamboat business- European style - 20 feet-12 people, environmentally -low impact,
low fuel consumption, low noise. Would go down from golf course to site on back
channel, then loop through main channel and back to golden

The following operate tourism operations adjacent to the wetlands but presently do not have plans to use the wetlands for commercial tours.

Glenn Findlay - Columbia Rafting Tours (345-6155)

They use the portion of the river from just south of Columbia Lake down through Fairmont to the sub-division below Fairmont. This portion of the river is not in the WMA.

Erwin Perzinger Columbia Valley Lodge (348-2508)

adjacent to the wetlands near Nichol森.

issue of ownership of lake bottom

Ron van Vugt -Wells Landing B&B (348-2273)

No present interest in commercial use of the wetlands.

Pete's Marina -boat rentals agencies on Windermere Lake at Athalmer.

May be renting jet-skiis.

Dave Fountain -Rocky Mountain Outfitters (344-2971)

box 1797, Golden

trail rides with wetland tours (with W. Houlebrook) and canoe rentals included in brochure.

Rainer Jaeger - The Timber Inn (348-2228)

lodge above the wetlands at Parson

FILE 1-C. BACKGROUND ON THE 10 HP ISSUE

We have attempted here to provide some basic facts on the factors relevant to the control of access to the wetlands and the Columbia River.

PHYSICAL FACTORS

Access: There is very little official road access to most of the wetlands. In effect, the only public access is at the bridge crossings at Fairmont, Athalmer, Radium, Brisco, Spillamacheen, Parson, Nichol, Golden and Donald. The only developed boat launch is at Athalmer. Other access is limited on the east side of the river by the railway and on some roads through private land. (There is one access route below Edgewater). It is limited on the west side of the river by steep slopes in some areas and by private land in others. There are occasional access points such as at the old Moore bridge south of Brisco. There are no developed launch sites for boats except at the Athalmer bridge. (Golden?) This limited access means that boating from one of the bridge sites is the primary human use of the wetlands. There are few areas where hiking or other types of use take place in summer.

In the fall, most hunters access the wetlands using small boats. In winter, the wetlands provide one of the few open areas where snowmobilers can run their machines at low elevation. Snowmobiling is an important local recreational activity, especially for residents of the small communities along the wetlands. At Golden, several businesses have developed catering to snowmobilers coming to the area from Alberta. Their primary areas of use are logging roads and some open areas in the alpine in drainages adjacent to the wetlands.

The railway bridge just downstream of Radium is relatively low and limits boat access during high water (late May to mid July) downstream from that point, except for boats that can be hauled over the railway embankment.

At least during high water, a 10 HP motor cannot efficiently travel upstream on the Columbia River, according to some people who use the river.

The horsepower of various vehicles that are of concern are:

- snowmobiles - 25 to 150 HP. (very old machines may be as low as at 18 HP)
- All Terrain Vehicles - 20 to 50 HP
- jet-skis- 85 to 130 HP
- jet-boats - >100 HP
- stern wheelers - >100 HP

A horse power regulation may be a problem since most motors are now rated on the basis of displacement (total cylinder volume) or torque rather than horse power.

A majority of the wetlands are not accessible by large boat from the river, except at high water since the channels draining into the wetlands tend to be shallow and narrow. The National Wildlife Area at Wilmer does not include the main river channel.

Regulations to reduce disturbance by boat traffic in the area is dependent on WMA regulations.

Navigability varies in different portions of the river. There are sand bars at Toby Creek at low water that limit access to the lower river. In the fall there are bars throughout the system that limit access for larger boats.

Ecological Factors

Winter ungulate use of the wetlands is concentrated on the alluvial fan areas where major tributaries come into the wetlands. The levees are used for cover and browsing and the sedge meadow areas are used for grazing, especially early in the winter. In late winter they shift onto south-facing slopes on the adjacent benchlands.

Puddle ducks (upland nesters) use the wetlands in spring and fall for staging. They nest in adjacent fields above the wetlands. They do not nest in the wetlands proper, except where there are dryland areas on levees and alluvial fans.

Diving ducks, coots, grebes and others that nest on floating nests in the wetlands are limited in their nesting success by annual flooding. Disturbance of these species is unlikely at present since most recreational activity is concentrated along the main river channel.

There is a wide range of articles on the impact of human activity on nesting waterfowl and habitat, including reviews of the issue by York 1994, Dahlgren and Korschgen 1992 and Vaske et al. 1994.

Only one of the five known Blue Heron rookeries is located adjacent to the main river channel. Activities on the river therefore should have minimal affects on nesting for herons. It is not know if the river is an important feeding area. The river is silt laden for most of the breeding season which would presumably make fishing more difficult than in the clear waters in the adjacent wetlands.

There are 20 or so known osprey nests in the wetlands. Many of these are located in trees adjacent to the river channel. There are also 3-5 bald eagle nests.

Several cavity nesting species may also use cavities in larger cottonwood trees adjacent to the river channel. These are the bird species that would potentially be affected by boating activity on the main river channel. There is no information on the abundance of these species in the wetlands or the distribution of cavity nesting sites. There is some information on the impact on human activity on these species. Steidl 1994 looked at bald eagles in the interior of Alaska and found that "...Productivity and nest success, but not density, of pairs along the corridor were negatively associated with levels of human activity." He also noted that "...human activity near nests altered breeding behaviour, and suggests that "...if disturbances in nesting territories were sustained, eagle populations could be affected adversely." French and Koplin 1977, Levenson and Koplin 1984 and Poole 1981 conclude that ospreys habituate to recreational activities in the vicinity of their nests over time (i.e. breeding seasons), but at the beginning, timing in

relation to breeding chronology is critical with respect to likelihood of impacts.

The wetlands are the only open area available to locals for snowmobiling at low elevation.

Commercial tours and Alberta groups use roads and alpine areas, not the wetlands. Use is primarily adjacent to the communities along the wetlands. Use would appear to be higher at the north end of the wetlands where there are greater snow depths.

There is a wide range of literature on the impact of snowmobile use on ungulates, but little on the effect on habitat. Sojda 1978 looked at the impact of snowmobile use on cattail beds used by wintering pheasants.

PRESENT RECREATIONAL AND COMMERCIAL USE

Boating

The wetlands and the channels of the Columbia River have been used for decades by canoeists and other boaters. In recent years there has been some use of the river channel by jet boats and more recently, by jet-skis. A description of the activity taking place, based on discussions with people using the area, is provided below.

Columbia Lake to Fairmont: This portion of the river is outside the WMA. It is used by a commercial rafting company. It is too shallow for use by large motor boats and launch sites are limited.

Fairmont to upper end of Windermere Lake: Raft and canoe use is limited by access and the need to paddle across Windermere Lake to Rushmere to pull out. (The dock at Rushmere is private). One jet boat operator takes commercial tours up through this portion of the wetlands. Private jet boats and motor boats also use this section of the river, generally in mid-summer. In the fall hunters use motor boats, generally with smaller motors, to access waterfowl hunting in Mud and Tatley Lakes.

Access to Tatley Slough which is wetland "owned" by the Columbia Lake Band may be an issue. Access to the wetland area owned by Fairmont Hot Springs Resort may also be an issue.

Athlmer to Radium: There is regular use in the summer of this portion of the river and wetlands by canoes and small boats and use by waterfowl and ungulate hunters in the fall. This is the starting point for most people wanting to canoe or boat the entire wetlands. There is a good boat launch below the bridge at Athlmer and a boat rental facility just above the bridge. One commercial jet boat operator uses this portion of the river for commercial trips. Larger motor boats also use the area and at least one local group has in the past used the Athlmer Pond as a slalom course for water-skiing. Three jet boat operators use this portion of the river and jet-skis have been seen on this portion of the river.

Radium to Brisco: This portion of the wetlands is not accessible with larger boats

during high water due to a low railway bridge below Radium. Most use on this portion of the river is by canoes, small boats and rafts. One commercial operator runs occasional trips (1-2 per year) on this portion of the river, others are considering trips in this part of the river. Hunting is an important use in the fall.

Brisco to Spillamacheen: Use on this portion of the river is similar to that described above.

Spillimacheen to Parson: This portion of the river receives regular use in the summer canoes and small boats. Some residents of the area use larger motor boats on this portion of the river.

Parson to Nicholzen: This portion of the river also receives regular use in the summer canoes and small boats. Some residents of the area use larger motor boats on this portion of the river. There is one commercial operator using the area from McMurdo to Horse Creek for nature tours. Mulligan Slough (south of Nicholzen on the west side) has traditionally been used for water-skiing.

Nicholzen to Golden: This portion of the river receives regular use in the summer and fall by canoes and boats with motors ranging from 2.5 to 70-90 HP, by people running up the river from Golden. Two commercial operators run tours in this portion of the wetlands on a regular basis, others use it occasionally.

Golden to Donald: This portion of the river apparently receives less use by motor boats than the portion of the river upstream from Golden. There are no commercial operators using this portion of the river on a regular basis at present, however, at least three operators are considering operations on this portion of the river in the future. The gradient on this portion of the river is greater than that upstream of Golden.

Donald to the Mica Reservoir: This portion of the river is outside the WMA. There is only a short portion of flowing river below Donald before one runs into the flood area of the Mica Reservoir. It is open to large motors, but does require run across the reservoir to boat ramps on the reservoir. This portion of the river is not particularly scenic.

SEASONAL LEVELS OF USE

Early spring (Apr.-May) (prior to high water)

There is little use in this period by boats. There is some use by ski-doo's, but by this time the ungulates have moved to the benches above the wetlands. Any potential impact is low since few birds are back from the south. Access is limited by sand bars in many parts of the main channel.

Mid spring (Jun.-Jul.) (high water)

High water allows access to wetlands from river channel in many areas. The river below the railway bridge at Radium is not accessible due to low clearance under the railway bridge. Higher levels of use by larger boats and by canoeists occurs. Most non-local use occurs in this period. Nature history tours and jet boat tours begin their season. Birds are establishing nesting sites and are sensitive to disturbance. Floating nesters in the wetlands proper would be impacted by boat traffic into the wetlands. Unknown number of cavity nesters and tree-nesters along the main channel would be impacted by river channel traffic.

Mid summer (Aug.-Sep.10) (medium water levels)

Lower water levels limit use to a minor degree. The river channel below the railway bridge at Radium is accessible from Athalmer. Waterfowl and other birds have fledged and are less sensitive to disturbance. Comparatively high use continues. Nature history tours and jet boat tours continue.

Fall (Sep. 10-Oct. 31) (low water levels)

Hunting use is the major use, generally with smaller motors (5-30 HP). Larger motors with deeper foot depth are limited in the area they can access by low water in most years. High waterfowl numbers occur. Ungulates move into the wetlands in mid-October.

Winter (Nov.-Mar.)

Boat access is limited by very low water. Snowmobile use is found in many areas, primarily by local people from small communities and Golden. Levels of use and impacts are not known.

MANAGEMENT OPTIONS

This issue was a major concern during the period in which this management plan was being developed. There is a jurisdictional issue between the federal and provincial governments concerning the management of boating activity that has not been resolved at this point (Jan. 1998).

If it is found that the province does have jurisdiction in the area of managing boating access, then it is likely that the 10 Hp regulation will remain in place. Some areas such as Mulligan Slough could be removed from the regulation to allow local water-skiing and other activities with larger motors.

If it is found that the federal government and the Coast Guard are responsible for regulations of this kind, then some form of further public consultation may occur. The likely result of that process will be that the 10Hp regulation will be replaced by either a regulation allowing all forms of boats and motor size in the main river, likely with a speed limit imposed, and a closure for larger motor boats or all boats in the wetlands proper.

The major problem with this potential regulation is that it will have to be enforced by federal authorities. This will mean that either the local RCMP would have to enforce it, and would need access to the wetlands (i.e. purchase of a boat), and would have to take time from other duties, or a Coast Guard employee would have to be posted to the area. Neither is likely to occur and the end result would be that the regulation would not be enforced in any effective way unless some form of self-policing by the users is developed. This would fit with the desire by many people to develop the "river keepers" concept in the WMA.

The major concern of the branch should be the trade-off between a simple regulation and a potential loss of local support for the protection of the wetlands. Many people feel a very obvious sense of stewardship toward the wetlands, and many of these people use larger motors. There is a choice of minimising impacts by regulation, or by developing a stewardship strategy including "river keepers" that would minimise impacts by maintaining a stewardship presence in the wetlands, allowing local people to explain to users the reasons for any regulations and identify the values in the wetlands.

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Reviews of major papers on the impact of recreational use on wetlands.

Liddle, M.J.; Scorgie, H.R.A. 1980. The effects of recreation on freshwater plants and animals: a review. Biol Conservation 17: 183-206. 24 pp.

“It is apparent however, that, as has been found for terrestrial habitats, low levels of shore-based use increase the numbers of plants growing at a particular site and that higher levels reduce this richness.”

“...the fauna will be much more sensitive and, especially in the case of mammals and birds, will start to decline in numbers of species and individuals at lower intensities of use than plants.”

“Research into the compatibility of nature conservation and the recreational use of water resources should be encouraged, and the results made available to those responsible for determining the form and techniques of management. If this is not done, many of our freshwater habitats may suffer drastic and irreversible change, to the detriment of wildlife and visitors alike.”

Sojda, R., Jr. 1978. Effects of snowmobile activity on wintering pheasants and wetland vegetation in northern Iowa marsh. Iowa Coop. Wildl. Research Unit. M.S. Thesis. 72 pp. Abstract only.

“In cattail marshes similar to the one studied, snowmobiling probably would have little or no effect on pheasant populations if traffic could be confined to a few, widely-spaced trails.”

“Trail grooming with snowmobiling caused a 23 percent decrease in cattail density, 12 percent (12 cm) decrease in cattail height, and a 44 percent increase in Carex density ($P < 0.005$).”

“Vegetation changes observed in this study would not result in a serious alteration of wildlife habitat if snowmobiling were to be confined to dispersed trails.”

Vaske, J.J.; Decker, D.J.; Manfredi, M.J. 1994. Human dimensions of wildlife management: an integrated framework for coexistence. PP 33-49 (Chap. 3) In Wildlife and Recreationists: Coexistence through Management and Research. R.L. Knight and K.J. Gutzwiller (Eds.) 17 pp.

“A recent review of the scientific literature concerning visitor impact management (Kuss et al. 1990) concluded that there are five major sets of considerations that are critical to understanding the nature of ecological and social impacts.

There is no single, predictable environmental or behavioural response to recreational use.

...

The relationships between use levels and impact variables are neither simple nor uniform. Most impacts do not exhibit a direct linear relationship with user density.. It appears that the number of people using a given area plays a smaller role in human-wildlife relationships than selected characteristics of recreational use, such as frequency of use, type of use, and the behaviour of visitors. ...

Different types of wildlife and user groups have differing tolerances for interactions with people. Some wildlife species have declined in response to increasing levels, while other species have benefited. Animal responses to human intruders are often divergent even within a single wildlife species. ...

Some recreational activities create impacts faster or to a greater degree than other types of activity. Impacts can vary even within a given activity according to type of transportation or equipment used and visitor characteristics such as party size and group behaviour. ...

Recreational users may create critical situations for given species during some seasons and have no effect on the same animals under other conditions.”

York, D. 1994. Recreational-boating disturbance of Natural Communities and Wildlife: An Annotated Bibliography. Biol. Report No. 22, National Biol. Survey, Dep't of the Interior. 29p.

This paper provides a review of 111 papers concerned with the impact of boating and other water-based recreation on wetland and aquatic habitats, vegetation and wildlife, primarily birds. There are several papers from Australia and Europe. Motor boats, canoes, sail boats, rowboats, etc. are discussed, sea-doo's are not discussed. Fuel and oil residues left by water-cooled outboard motors and oxygen depletion are issues in some areas, as is damage to vegetation, and the effect of motors stirring sediments and changing the turbidity of water and creating shoreline degradation.

A 100-400 m no motor zones are recommended in several papers to protect colonial nesting birds and nesting waterfowl. There was little information on osprey, eagles or ungulates.

Dahlgren, R.B. and Korschgen, C.E. 1992. Human disturbances of waterfowl: an annotated bibliography. USFWS, Resource Publ. 188. 68 pp.

“The definition of human disturbance of waterfowl varies by author. A reasonable definition that we prefer is an intentional or unintentional action that elicits alertness; obvious or inapparent [sic] fright; interruption of activities; flight, swimming, or other displacements; or causes death or disablement.”

This bibliography contains annotations for 211 articles with information about the effects of human disturbances on waterfowl.

FILE 3-A. POTENTIAL LAND ACQUISITIONS

In the process of considering boundary issues for the WMA, we have identified several private properties that could be acquired to improve the integrity of the WMA. These are described below, from south to north. The priority areas for acquisition are:

- District Lot 295 south of Fairmont
- The portion of Sublot 163D east of the CPR right of way, between Fairmont and Windermere Lake
- District Lots 3955 and 11107 just south of Radium Hot Springs

Maps of these priority sites are included (Figures 1. to 3.) along with further details on each site.

DISTRICT LOT 295, BETWEEN FAIRMONT AND WINDERMERE LAKE.

OVERVIEW

Location: This lot is located 2 km north of Fairmont Hot Springs, on the west side of the river, north of the Fairmont airport (Lot 5352).

Rationale: This is a private lot on the south edge of Mud Lake. Mud Lake is used extensively by waterfowl hunters. This is one of the largest private lots in the wetlands.

Objectives: The objective is to maintain wetland values and recreational opportunities on this site.

Expected Benefits: The purchase of this area would maintain a integrity of the wetlands in this area. Dyking and filling may be an option if this lot remains in private hands.

SITE DESCRIPTION

Area: District Lot 295 is 57.46 ha (approx. 140 ac).

Ownership: Fairmont Hot Springs Resort.

Present Use: There is little present use except for recreation, primarily waterfowl hunting. There is some use of the adjacent river channel for canoeing and boating.

Map Sheet: 1:20,000 - R82K.040.

Air Photo Nos: 30BC852 - # 207.

Biogeoclimatic Subzone\variant: IDFun

Site Series: (wetland)

Elevation: 875 m. (2600 ft.)

Aspect: flat

Slope: none

Vegetation: Wetland with extensive emergent vegetation..

Habitat Values: The area is an important staging area for waterfowl.

BACKGROUND

This lot would be difficult to develop for other uses. There is poor road access from the golf course property to the south.

Figure 1. An air photo of Lot 295, south of Fairmont.

THE PORTION OF SUBLot 163D EAST OF THE CPR RIGHT OF WAY, BETWEEN FAIRMONT AND WINDERMERE LAKE.

OVERVIEW

Location: This lot is located 4 km north of Fairmont Hot Springs, west of the Columbia River, to the south of Lot 217.

Rationale: The property includes wetlands that are is used extensively by waterfowl hunters and is adjacent to the river channel which used by boaters. This is one of the largest private lots in the wetlands.

Objectives: The objective is to maintain wetland values and recreational opportunities on this site.

Expected Benefits: The purchase of this area would maintain a integrity of the wetlands in this area. At present the WMA constitutes only the west half of the river channel in this portion of the wetlands, since the east half of the channel and the wetlands on the east side are part of the Columbia Lake Indian Reserve.

SITE DESCRIPTION

Area: Approximately 100 ha.

Ownership: Originally part of the Hofert property, the present owner is not known.

Present Use: No present use except for recreation, primarily waterfowl hunting. There is some use of the adjacent river channel for canoeing and boating.

Map Sheet: 1:20,000 - R82K.040.

Air Photo Nos: 30BC853 - # 59.

Biogeoclimatic Subzone\variant: IDFun

Site Series: (wetland)

Elevation: 875 m. (2600 ft.)

Aspect: flat

Slope: none

Vegetation: Wetland with extensive emergent vegetation..

Habitat Values: The area is an important staging area for waterfowl.

BACKGROUND

This lot would be difficult to develop for other uses and has poor road access.

Figure 2. An air photo of the wetland portion of SL 163D, between Fairmont and Windermere Lake.

DISTRICT LOTS 11107 AND 3955, LOWER FORESTER CREEK.

OVERVIEW

Location: These lots are located 2 km south west of Radium Hot Springs on the west side of the Columbia River.

Rationale: These district lots are located in the wetlands directly visible from the highway hill and lookout south of Radium Hot Springs. Development on these lands would have a serious impact on the view of the wetlands most commonly seen by visitors.

Objectives: The objective is to maintain wetland and bench land values on this site.

Expected Benefits: The purchase of these lots this area would maintain a large wetland area.

Other Considerations: The peninsula of dry land on Lot 11107 could provide a site for a visitor centre. Purchase of Lot 11107 should be considered. Survey costs to purchase the wetland portion of Lot 3955 would be excessive; the acquisition of a conservation easement may be an more effective approach.

SITE DESCRIPTION

Area: District Lot 11107 is 71.63 ha and District Lot 3955 is 110.07 ha

Ownership: DL. 11107 is owned by Albert Earl Barbour and DL. 3955 is owned by Eugene Stanley Garbowski.

Present Use: DL 11107 is mostly wetland with a dry peninsula and house located in the middle of the lot. DL 3955 lot is 70% wetland with the east portion being hayland. There is some use of the adjacent river channel for canoeing and boating.

Map Sheet: 1:20,000 - R82K.060 and 070.

Air Photo Nos: 30BC872 - # 113.

Biogeoclimatic Subzone\variant: IDFun

Site Series: (wetland)

Elevation: 875 m. (2600 ft.)

Aspect: flat

Slope: none

Vegetation: Primarily wetland with some dry land (grassland with scattered Douglas-fir on a point of dry land jutting out into the wetlands.)

Habitat Values: The area is an important staging area for waterfowl.

BACKGROUND

Ownership in this area, by lot, south to north, is:

- **BkA -11T1337** - A small block owned by H. Feldmann
- **L. 703** - Owned by H. Feldmann
- **L. 701 (south half)**- Owned by a Eugene Stanley Garbowski. The portion east of Forester Creek is wetland.
- **L. 701 (north half)**- Owned by Nancy Newhouse and Trevor Kinley. Presently for sale.
- **L. 2578** - The portion west of Forester Creek is owned by Tok Hameren (Wilmer). It is primarily benchland. The portion east of the river is crown, as a result of a land trade between H. Feldmann and the crown.
- **L. 2577** - The portion west of Forester Creek is private. It is primarily benchland. The portion east of the river is crown, as a result of a land trade between H. Feldmann and the crown.

Figure 3. An air photograph of District lots 11107 and 3955, south of Radium Hot Springs.

Medium Priorities for Acquisition

There are several small lots and portions of lots in the wetlands between Radium Hot Springs and Donald. Most of these are a low priority for acquisition due to their small size. They generally have little potential for development for other uses. In some cases some of these private lands could be developed for recreational uses that might impact on the WMA. The most important of these are:

1. Lot 10725: This property is just north of the Horsethief Bridge and immediately west of Radium Hot Springs. It has been considered as a site for a wildlife viewing centre. It was previously part of the Kirk property and is now owned by F. Schickedanz. Almost the entire property is wetland. This wetland has a stable water level and is quite productive for waterfowl.

2. Small Parcels- Radium to Kindersley Creek: There are several small parcels belonging to the F. Schickedanz that intrude into the wetlands. Taken together they would be of value to the WMA.

3. Parcels between Luxor and Body Creeks: The west portions of four lots (Lot 7571, Lot 448, Lot 7570 and Lot 351, Parcel 2) in this area are in the wetlands. Taken together these lots could make a substantial contribution to the continuity of the WMA. One lot (L. 7571) is part of the F. Schickedanz property.

4. Parcels south of Spillimacheen: Four parcels just south of Spillimacheen on the east side of the river would contribute to the continuity of the WMA, if acquired together. The lots are L. 1904, L. 11028, L. 2567 and L. 1905.

5. L. 9005 and the portion of L. 11327 below the CPR right of way, 1 km north of Spillimacheen: Mary Yaternuk (344-0103) would like to donate approximately 12 ac. located below the tracks to the crown or Nature Conservancy to become part of the WMA. She would like to see hunting closed on this small wetland.

6. Cottonwood stands at Nicholzen: A single large ranch property south of the Nicholson road and some smaller properties to the north of that road support the largest cottonwood site in the wetlands. A conservation easement should be considered to maintain riparian cottonwood values in this area.

7. Parcels in the wetlands between Nicholzen and Golden. There are several parcels of private land in this area. Conservation easements or purchase should be considered to maintain wetland values in that area.

LISTING OF ALL ADJACENT PRIVATE LANDS

All of the private lots impinging on the wetlands are described below.

BLOCK 1. The marshes of Mud Lake and Tatley Slough to the south end of Windermere Lake. (Map 82J 021) (Map 3.)

Sublot 163D of District Lot 4596, south portion: A small portion of SL 163D is an area shown as wetland west of the CPR tracks and the Fairmont airport. The site is fairly dry, flooding seasonally and supports alder thickets and sedge/grass meadows. The adjacent Hofert lands have been logged recently. Low priority.

Lot 295: This is a large lot in the wetlands north of Fairmont. Acquisition of these lands should be a priority. Details are provided above.

The portion of Sublot 163D of District Lot 4596 east of the CPR right of way: Acquisition of these lands should be a priority. Details are provided above.

BLOCK 2. Windermere Lake. (Map 82K 050)

There are no acquisition options in this area.

BLOCK 3. The marshes and riparian areas from the north end of Windermere Lake to Radium Hot Springs. (Map 82K 060) (Map 4.)

Lower Forester Creek: This is the area one looks down on from the Radium Hill lookout on Highway 95. Lots 11107 and 3955 should be considered a high priority for acquisition and are described above.

Dry Gulch Corridor: There are not acquisition options in this area. The Crown lots adjacent to the park have been part of a proposed trade with national parks for several years. There has been no recent action.

BLOCK 4. Radium Hot Springs to Nicholzen.

Private properties in the wetlands are discussed below, by river reach and map sheet. They are listed south to north for the east side of the river, then for the west side, again from south to north.

Radium Hot Springs to Edgewater: (Map 82K 070) (Map 5.)

east side

L. 10725: This property is just north of the Horsethief Bridge and has been considered as a site for a wildlife viewing centre. It was previously part of the Kirk property and is now owned by F. Schickedanz. Almost the entire property is wetland. This wetland has a stable water level and is quite productive for waterfowl. Medium priority.

L. 5111: Located between L. 10725 and the railway tracks. The Radium air strip is on this property. Most of the lot is shrub and with some wetland. An easement on the remaining wetland portion might be considered.

Piece 23 T 713 FDR 0124672: This lot includes the south portion of the wetland discussed above. It is traversed by the Horsethief Forest Road.

L. 272, north west corner: A portion of this lot is across the river channel from the remainder of the lot. It was previously part of the Kirk property and is not now part of the F. Schickedanz property. Low priority.

L. 7578: This lot includes a very small piece across the tracks in the wetlands. It is owned by F. Schickedanz. There are some minor wetland values east of the river. Low priority.

L. 673: A portion of this piece is wetland west of tracks. A small corner is across the secondary river channel. There are small wetlands above the tracks as well. It is owned by F. Schickedanz. A small portion of the remainder of the piece is cultivated. Low priority.

L. 348 - Parcel 1: 60% of this parcel is wetland below the tracks. This lot is not part of the F. Schickedanz property. Low priority.

L. 348 - Parcel 8: 20% of this parcel is wetland below the tracks. This lot is not part of the F. Schickedanz property. Low priority.

L. 348 - Parcel 10: 50% of this parcel is wetland below the tracks. The portion above the tracks is part of the F. Schickedanz property. Low priority.

L. 348 - Parcel 14: This parcel is shown as private in Thurber 1980, but as crown on the status maps from BC Lands. 75% of the parcel is wetland and channel. Low priority.

Edgewater to Brisco: (Map 82K 070) (Map 6.)

east side

Lot 352, Parcel 3: About 40% of this piece is wetland below the tracks. There is also a good wetland area above the tracks. This lot is part of the F. Schickedanz property. Low priority.

Lot 352, Parcel 5: About 40% of this piece is deciduous forest and wetland below the tracks, there is also a good wetland area above the tracks. This piece is located at the base of Kindersley Creek and is fluvial in origin. It may be used by wintering ungulates. The "Moore Bridge" is located on the river on this piece. Medium priority if used by ungulates. This lot is part of the F. Schickedanz property.

Lot 352, Parcel 12: The south-west corner (above tracks) of this piece is temporal wetland. This lot is part of the F. Schickedanz property. Low priority.

Unnumbered lot west of L353, sec. 12 and 13: There is a wetland in the lower end of lot and an isolated piece across the river. This lot is part of the F. Schickedanz property. Low priority.

Lot 7571: There is a small wetland and deciduous forest area below the tracks, along with cultivated fields. This lot is part of the F. Schickedanz property. Small, but a medium priority if acquired in conjunction with the two properties to the north.

Lot 448: There is a large wetland and deciduous forest area below the tracks, along with cultivated fields. This lot is not part of the F. Schickedanz property. Medium priority since it is adjacent to Lot 7570 to the north.

Lot 7570: This lot is 70% wetland. This lot is a medium priority for acquisition due to its size. It could be acquired in conjunction with Lot 448 and 7571 to the south.

Lot 10717: This lot includes a small wetland in the south-west corner. This lot is part of the F. Schickedanz property. Low priority, but it is adjacent to Lot 7570 to the west.

Lot 351, Parcel 2: A portion of this block is across the Columbia River isolated from the majority of the block. There are also three small wetlands above the tracks. This lot is not part of the F. Schickedanz property. Medium priority if acquired in conjunction with the three properties to the south.

Lot 351, Sec. 11: A private block with steep slopes along the river. There may be some values for swallow nesting, etc. in clay cliffs. Low priority.

Brisco to Spillimacheen: (Map 82K 089) (Map 7).

east side

L. 14981: This entire block is wetland below the tracks. It is small piece, adjacent to CWS lands. Low priority.

L. 6089: This lot is hillside west of L. 14987 with a small wetland. Low priority.

L. 6086: Very small wetland piece, north of the Brisco bridge. Low priority.

L. 1903: 50% of this lot is wetland below the tracks and across the river. This is a lone piece of private land in a portion of the wetland that is entirely crown. It is located 2 km north of Brisco. Low priority. The owner is Wilfred Chuck..

L. 350, Parcels 16 and 15: These pieces include two small wetland areas below the tracks. Low priority.

L. 1904: The portion below tracks is good wetland, about 50% of the lot. The owner is Arthur Galbraith. Medium priority if acquired with adjacent lots.

L. 11028: This is a small lot below the tracks at the outlet of Fraling Creek. Medium priority if acquired with adjacent lots.

L. 2567: The portion of this lot that is below tracks is wetland. Base of Fraling Creek. The owner is Rene Bosc. He was approached some years ago concerning acquisition of this parcel by the Nature Trust or the Second Century Fund at the time that the Nature Trust lands at Spillimacheen were acquired. Medium priority if acquired with adjacent lots.

L. 1905: The portion of this lot below the tracks is wetland. It is adjacent to the CWS lands at Spillimacheen. It is medium priority if acquired with the lots to the south.

west side

L. 11048: This lot includes a wetland area in the north-east corner adjacent to the CWS lands at Brisco. There is a large house on the bench above the river. Low priority.

L. 10722: This L-shaped lot includes a wetland area in the north-east corner. Low priority.

L. 11378: The home and farm buildings of the Siegried and Heidi Trescher are located on this lot. This lot includes “Trescher Slough”, a very productive wetland. That wetland could be protected with a conservation easement.

L. 2563: This lot is mostly farmland with some wetlands along the north edge. It is owned by the S. Trescher family. Discussions with the K'tunaxa Tribal Council suggest that there may be native use sites for salmon fishing on this and adjacent properties.

L. 9568: This lot includes wetland on the north and east with one small piece across the Botts Channel. A conservation easement could be considered.

L. 1385: This lot is wetland in the north-east half. There are buildings and a house on the south-west portion. A conservation easement could be considered.

L. 350, quarter 2: This lot is wetland in the north-east half. There are buildings and a house on the south-west portion. A conservation easement could be considered. This is part of the P. Feldmann Property.

L. 350, quarter 4: This lot is wetland in the north-east half. A conservation easement could be considered. This is part of the P. Feldmann Property.

L. 11104: This is an isolated parcel of forestland adjacent to Bugaboo Creek. Acquisition would forstal development as a recreational property.

L. 1022: This lot is wetland in the north-east portion, the remainder is meadow and forest. It is leased for grazing to P. Feldmann.

L. 3948 and L. 223: These lots are wetland in the north-east portions, the remainder are farmland and forest. They are adjacent to the CWS lands at Spillimacheen (Bk D. L. 9004). They are located on the alluvial fan of the Spillimacheen River.

Spillimacheen River to Harrogate: (Map 82K 088 and 82K 099) (Map 8.)

east side

L. 1905: This lot overlaps the map boundary. It is described in the previous section.

L. 2566: There are three small wetland areas below the tracks are wetland. Low priority since they are small.

L. 9005 and the portion of L. 11327 below the CPR right of way: Mary Yaternuk (344-0103) would like to donate approximately 12 ac. located below the tracks to the crown or Nature Conservancy to become part of the WMA. She would like to see hunting closed on this small wetland.

Blk A, 28T249, a portion of parcel 8, Lot 349 east of the Columbia River: This is a private lot just to the west Mary Yaternuk's parcel. The north end of that lot shows a public access to the river (undeveloped). A Reverand. Scorts from California owns this lot. It could be acquired in conjunction with the Yaternuk parcel.

Block A of Parcel 8, Lot 349: This is a small wetland area below the tracks. Low priority.

L. 9571: A small portion of this lot is across the river channel. Low priority.

Portions of parcels 3,4,5,12 and 13 of section 14, TP23 R18 W5M: Most of these blocks are wetlands below the railway. Low priority.

Portions of parcels 1, 7 and 8 of section 15, TP23 R18 W5M: These blocks are wetland and are located across the river channel.

Parcels 3,4 and 5 of Section 22, TP23 R18 W5M: These blocks are below the tracks at Hatch Creek and are wetland. Low priority.

Parcels 9, 10, 15 and 16 of Section 21, TP23 R18 W5M: Portions of these blocks are below the tracks south of Harrogate. Parts of parcel 9 and 10 are across the channel. Low priority.

Parcels 3,5 and 6 of Section 28, TP23 R18 W5M: Portions of these blocks are below the tracks. Very small. Low priority.

(west side)

Lot 3948 and L223: These lots overlap the map boundary. They are described in the previous section.

L. 11454: The power plant on the Spillimacheen River is located on this parcel. There is a small wetland in north-east corner. Low priority.

Harrogate to Parson: (Map 82K 008 and 82K 097) (Map 9.)

east side

Section 32, TP23 R18 W5M: A small portion of this block is below the tracks. It supports deciduous forest and is very small. Low priority.

Portions of south quarters of Section 6, TP24 R18 W5M: These blocks are wetland located below the tracks. They are small and are low priority.

Portions of north quarters of Section 1, TP24 R19 W5M: There are two small blocks of wetland below the tracks. Low priority.

Portion of south-west quarter of Section 12, TP24 R19 W5M: Includes wetland below the tracks. Small, low priority.

Portions of south-east quarter of Section 11, TP24 R19 W5M: Includes some wetland below tracks and across the channel. Small. Low priority.

Portions of north-west quarter of Section 11, TP24 R19 W5M: Includes some wetland below tracks. Small. Low priority.

Portion of north-west quarter of Section 10, TP24 R19 W5M: About half of this block is below the tracks and across the Hogranch Channel. Small. Low priority.

Portions of south-east quarter of Section 16, TP24 R19 W5M: Includes some wetland

below the tracks and across the Hogranch Channel. Small. Low priority. It is located on the alluvial fan of Beard Creek.

Portions of north-west quarter of Section 16, TP24 R19 W5M -: Includes some wetland below the tracks and across the Hogranch Channel. Small. Low priority.

Portions of south-east and north-west quarters of Section 20, TP24 R19 W5M: Includes some wetland and dry site forest below the tracks along the Hogranch Channel. Small. Low priority.

Portions of south-east quarter of Section 30, TP24 R19 W5M: The old mill site area Parson is located on this parcel.

Portions of south-west quarter of Section 30, TP24 R19 W5M: This block is wetland with a sawdust pile at the south end. It is owned by CFI.

Portions of north-west quarter of Section 30, TP24 R19 W5M: This block is dry land owned by Cal Phillips.

Portions of the north quarters of Section 25, and portions of south quarters of Section 36, TP24 R19 W5M: This block is dry land owned by Art and Mary Hough..

Portion of north-east quarter of Section 35, TP24 R19 W5M: Includes a wetland below the tracks. Small. Low priority.

west side

Portion of south-west quarter of Section 17, TP24 R19 W5M: The Well's Landing B/B is located on this site, owned by Ron van Vugt.

TP24 R19 W5M - Section 17, north-east quarter: Air photos indicate habitation and farmland on this site. The north-east corner is wetland. Low priority.

North-west quarter of Section 18, TP24 R19 W5M: There is some farmland and a home owned by P. Mason on this parcel.

North-west quarter of Section 19, TP24 R19 W5M: There is farmland on the south-west portion of this parcel, the remainder is crown.

North-west quarter of Section 24, TP24 R19 W5M: There is farmland on the north-west portion of this parcel, the north-east corner is Crown. Low priority.

South-west quarter of Section 25, TP24 R19 W5M: The north-east boundary of this parcel is a secondary river channel. Some wetlands occur west of the channel. Low priority.

North-west quarter of Section 26, TP24 R19 W5M: The north-east portion of this parcel is wetland. Low priority.

Parson to Nichol森: (Map 82N 016 and 82N 017) (Map 10.)

east side

There are 17 very small parcels along this section of the wetlands. The only lot of any size is described below.

1/2 of the south-west quarter of section 20, TP25 R20 W5M: This is the only private lot of any size in this portion of the wetlands. It is located just south of McMurdo.

west side

Portion of south-east quarter of Section 8, TP25 R20 W5M: There is a residence on this isolated parcel. (Carbondale Landing). Minimal wetland.

West half of the north-east and south-east quarters of Section 5, TP25 R21 W5M: This block is wetland and deciduous forest while the slopes above are logged. It is located just south of Nichol森 on Milligan slough. Access to this slough is across this land.

BLOCK 9. The dryland area at Nichol森 created by the alluvial fan of Canyon Creek, most of which is private farmland. (Map 82N 026) (Map 11-south half)

east side

Portions of the south-west half of Section 8 east of the Columbia River and below the railway tracks, TP25 R21 W5M: This is a very small site.

Portions of the west half of Section 17 east of the Columbia River and below the railway tracks, TP25 R21 W5M: This site is dominated by cottonwood, willow and birch. It is one of the larger sites along this portion of the river. A conservation easement should be considered to maintain riparian cottonwood values.

There are several small parcels below the railway tracks from Horse Creek to Nichol森. All are low priority.

west side

Portions of the north-west quarter of Section 8 west of the Columbia River, TP25 R21 W5M: Most of this parcel is wetland.

A single large ranch property south of the Nichol森 road supports mature stands of cottonwood. This is the larger cottonwood site along this portion of the river. A conservation easement should be considered to maintain riparian cottonwood values.

BLOCK 10. The marshes and riparian areas from Nicholson to the mouth of the Kicking Horse River at Golden. (Map 82N 026) (Map 11-north half)

east side

There are three small parcels below the railway tracks from Nichol森 to Golden. All are low priority.

west side

Section 30, west of the river, TP26 R22 W5M: The south portion of these parcels are developed as farmland, however the north end is wetland and stands of mature cottonwood. A conservation easement should be considered to maintain riparian cottonwood and wetland values.

The south-east quarter and south half of the north-east quarter of section 36, TP26 R22 W5M: Most of these parcels are wetland, owned by the Saunders family. A conservation easement should be considered to maintain wetland values.

A portion of the north-west quarter of section 25 and a portion of the south-west quarter of section 36, TP26 R22 W5M: Most of these parcels are dryland, owned by C. Kochura of Golden. The west boundary of the property reflects the high water mark.

A portion of the south-east quarter of section 36, TP26 R22 W5M: This parcel is a island owned by C. Kochura of Golden. The boundary of the property reflects the high water mark.

Parcel A DD47999-I in the north-west quarter of Section 1, TP27 R21 W5M: This is a small parcel just south of Golden, owned by C. Kochura.

BLOCK 7. The townsite of Golden. (Map 82N 026 and 82N 036) (Map 12.-south half)

There are no acquisition options in this area.

BLOCK 8. The marshes and riparian areas from Golden to the mouth of the Blaeberry River. (Map 82N 035 and 82N 036) (Map 12.-north half)

There are no acquisition options in this area. The wetlands in this area are entirely Crown.

BLOCK 9. The floodplain habitat along the Columbia River from the Blaeberry River to Donald. (Map 82N045) (Map 13.)

east side

Portions of sections 29, 30, 31 and 32, Tp 28, R22, W5M -: Portions of these lots at the base of the Blaeberry River have been developed as farmland. They are adjacent to Gadsden Provincial Park.. Low priority.

There are two small parcels below the highway just south of Donald. They are not wetland areas. Low priority.

west side

Sections 10 and 15, Tp 29, R23, W5M: Portions of these parcels west of the river are private. There is a house at the north end on section 15. The lower portions contain some good riparian areas. Low priority.

