

WELLS GRAY CORRIDOR WILDLIFE VIEWING PLAN 1990
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MARCH 1990

SUMMARY

A. Land Tenure

5 of 6 corridor viewing sites (Map 1) are within Wells Gray Park, a Class A Provincial Park. The 6th site is on unalienated Crown Land (Lot 3179) bordering private land and Wells Gray Park.

B. Term of the Plan

The plan covers the period 1990 through 1994 but some recommendations are for ongoing projects such as habitat enhancement which would extend beyond this period.

C. Existing Uses, Access and Facilities

1 of 4 commercial operators is active in wildlife viewing.

Parks has 83 campsites, 17 roadside picnic tables, 2 viewing platforms, and 1 viewing tower within the corridor.

There is a summer naturalist program at the Clearwater Lake campsite.

An information centre at Clearwater distributes information on the park and has available an excellent publication describing natural features of the corridor.

Present use of the park is by 5,400 campground parties and 15,700 parties of day users per year.

Access is by a 2 lane paved road to Helmcken Falls and thence by gravel road to Clearwater Lake. 15 trails and roads totaling about 100 km access the corridor from the road.

D. Viewing Features

Black bear, moose and Chinook salmon are the primary viewing features of the corridor.

The corridor has 2 outstanding waterfalls and interesting landscape features of volcanic origin. These almost overshadow the secondary wildlife features of mule deer, grizzly bear, wolf, pine marten, small mammals, osprey, and other birds of several groups.

6 selected viewing sites are described.

E. Interpretive Themes

Interpretive themes are outlined for all of the primary and some of the secondary viewing features under the following headings: Bear the omnivore. Moose habitat. Salmon migration. Mule deer and snow. Beaver the architect of change. Pine cones and pine marten. Grizzly, wild spaces, and man. Predator prey interactions. Osprey and pesticides. Habits and habitats of 3 species of grouse.

F. Viewing Feature Sensitivity

Moose, a primary viewing feature, may be displaced from viewing areas by uncontrolled hunters, viewers, or dogs. All must be controlled.

G. Limitations to Viewing Use, and User Capacity

Lack of a single outstanding wildlife feature and the seasonality of viewing opportunities will limit the number of wildlife viewers in the corridor.

User capacity will be accommodated by a small increase in existing facilities.

H. Visitor and Facility Management

Many facilities for a wildlife viewing program are already in place.

The viewing program should be integrated with the interpretation program.

Visitors will have to be confined to viewing sites and trails to protect the viewing resource. When necessary, dogs will have to be controlled.

I. Wildlife and Habitat Management

Hunter activity in the park is low compared with the past, and harvests are a small % of existing wildlife populations.

Hunting influences behaviour of wildlife by making them more wary and more difficult to view. This results in animals that are more truly wild but decreases viewing contacts.

Further restrictions are recommended for hunting of black bear and for control of hunters during the moose L.E.H.

Habitat enhancement recommendations include patch clear cutting of deciduous growth, prescribed burning, planned logging to produce optimum forage and shelter by moose, artificial salt licks, and feeding stations for fur bearers and birds.

J. Public Safety

Potential hazards include poorly controlled traffic at parking areas, bear attacks, and falling from escarpments.

K. Marketing

Marketing options include road signage with logo of the viewing program; wildlife viewing brochure; viewing calendar and recent sightings update to be made available; direct mailouts to tour operators; monthly columns on wildlife viewing in corridor; special events program.

L. Research and Inventory

There is a biophysical inventory of the park available for planning, and there has been some wildlife inventory undertaken. More data is needed on small mammals of the corridor. The breeding bird survey, Christmas bird count, and the June bird count should be continued.

M. Development Plan and Budget

A 5 year development plan prioritizes development of sites and spending on non-specific site items. From the total budget of \$217,100., \$165,000 would be allocated to 6 viewing sites in the following order of priority: Grassy Ridge, Flatiron, Ray Farm, Horseshoe, Shadow Lake, and Placid Lake.

\$46,600 allocated to non-site-specific items would be spent on marketing items and habitat improvement for the south end of Green Mountain.

Division of spending by year would be: Year 1 - \$29,300; Year 2 - \$72,700; Year 3 - \$44,700; Year 4 - \$45,700; Year 5 - \$24,700 \$217,100.

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INTRODUCTION

The Wells Gray Road corridor encompasses the area accessible from the park road from Moul Creek to Clearwater Lake. Because of the large area involved, we found it necessary to slightly modify the format required by the provincial viewing program and by the present contract.

We followed the general outline to describe the wildlife viewing features and their management in the corridor as a whole. In addition, we selected 6 sites for which we describe wildlife features as well as outline methods for enhancement of viewing at these sites. This has led to some repetition but allows a focus that otherwise would have been impossible.

Although Wells Gray Park has significant wildlife populations of several species, opportunities for wildlife viewing along the corridor are limited. Dense vegetation limits visibility while a large part of moose and deer populations are migratory, leaving the corridor for extended periods each year.

Enhancement and promotion of viewing opportunities could bring additional park users and extend the time that visitors spend in Wells Gray Park. Some of the best viewing opportunities occur outside the period when the park receives its highest use. Therefore, an increase in yearly park visits could be accomplished with little additional capital costs for visitor facilities either by parks or by the private sector.

A. Land Tenure

The Clearwater Corridor is comprised of private land holdings, unalienated Crown Lands, and Wells Gray Provincial Park. The 6 viewing sites (Map 1) for which developments are proposed are within Wells Gray Park except for the Grassy Ridge site which is on Crown Land (Lot #3179) adjacent to the road from Clearwater to Wells Gray Park.

B. Term of the Plan

The plan covers the period 1990 through 1994. However, recommendations covering habitat improvement consider that this should be a continuing process extending beyond 1994.

C. Existing Uses, Access, and Facilities

There are 4 commercial operations licensed to operate within the corridor. Only one of these is active in assisting and promoting wildlife viewing.

Parks campgrounds are located at Dawson Falls, Falls Creek, and Clearwater Lake. Together they have 83 campsites, each with table and parking as well as access to tap or pump water from wells, garbage disposal, and pit toilets.

In addition, there are 17 picnic tables located at roadside at Helmcken Falls, Ray Farm, Deer Creek, and Redspring.

There is a viewing platform and an interpretive sign at Helmcken Falls and at the Chinook leap at Bailey's Chute. At the top of Green Mountain there is a viewing tower with some interpretation and there are interpretive displays at the park entrance.

There is a naturalist program at the Clearwater Lake campsite through the summer months that would be available to promote the wildlife viewing program.

There is an information centre at Clearwater, open year round, that promotes the park by distributing information.

Of particular relevance to the viewing program is the publication *Nature Wells Gray, The Clearwater Valley* available at the centre. This book describes most of the wildlife viewing features available in the corridor as well as its geology.

Camping, picnicking, fishing, hunting, cross-country skiing, viewing of geology, scenery, and wildlife are all carried out in season. Campground attendance in the corridor totals about 5,400 parties per year, with an additional 15,700 day use parties.

Access to the corridor is from Highway #5 at Clearwater by a two lane paved road as far as Helmcken Falls junction; from there a two lane gravel road leads to Clearwater Lake.

There are a number of trails which begin at the park road in the corridor. These are all areas in which wildlife viewing can take place.

TABLE 1: TRAILS ORIGINATING AT ROAD, WELLS GRAY CORRIDOR

Trail Name	Length in Km	Trail Type
Helmcken Canyon Rim Trail	4.8	III
Dawson Falls Viewpoint Trail	0.8	II
Clearwater - Murtle River Junction	3.0	III
Pyramid - Murtle River - Horseshoe Falls	14.5	II & IV
Stillwater Trail	9.5	IV
Placid Lake - White Horse Bluffs Trail	6.5	III & IV
Battle Mountain - Stevens Lakes Trail	17.4	III & IV
Foot Lake Trail	1.2	III
Cougar Lake Trail	4.2	IV
Horseshoe Access	1.6	IV
Ray Mineral Spring	1.6	II
Bailey's Chute	1.0	II
Norman's Eddy	1.6	II
Flatiron Trail	8.2	IV
MacLeod Hill Road	8.0	single lane
Total Kilometres	83.9	

D. Viewing Features

a. Primary Features

Animals of the corridor with potential to attract the most viewing interest are here listed in order of importance: black bear, moose, and Chinook salmon.

Black Bear

This animal is chosen over moose to top the list of viewing animals because it can often be seen in summer when most people visit the park. Although black bears are abundant through much of British Columbia, opportunities for viewing them in their natural habitat are limited. Compared with black bear, moose are seldom encountered along the corridor in summer.

The black bear population of the park has been guesstimated at around 400 (Wildlife Branch, 1987). Of these, probably 30 to 50 may be in the corridor during summer. There is some excellent bear habitat along the corridor although, because there have been few recent burns, most of it is well beyond its highest suitability to support bears.

Best viewing times are in May and June when bears graze along roads, and again in October when they feed on Chinook salmon along the Clearwater River.

Black bears are hunted during open seasons in spring and fall. These seasons do not attract many hunters. An average of only 15 hunters per year spend 60 hunter days to take about 2 bears per year. The kill of black bear in the park is light compared to the period '52 -'62 when the take averaged 6 per year in the fall season alone. Most hunting now occurs in the spring season before tourist traffic becomes heavy.

Moose

The park population of moose is estimated at about 800 (Sather and Jones, 1984). This is roughly 1/3 of the peak population of the 1950s when moose were highly concentrated on park winter ranges (Edwards, 1957; Ritcey, 1982). About half of the population winters within the corridor or passes through it on migration. Some highly productive winter range is found within the corridor although nearly all of this range is well below its capacity to produce winter forage for moose and deer. Despite this, moose numbering up to 15 may be seen regularly during mid-winter on Green Mountain from the main park road.

Because most of the population leaves the corridor to summer at higher elevations, moose are seldom seen along the corridor from June through August.

Moose hunting is a significant activity in the park during the off season. For the period 1984 through 1988, hunter numbers averaged 225 annually, hunter days 850, and harvests 36. Over 1/3 of the moose harvest is during the limited entry hunting season that takes place in early January. An average of 33 hunters participate in the limited entry hunt with hunter days averaging 100. The hunters are accompanied by companions who assist in breaking trails and packing out the meat. Hunting and packing combined produce an average of 194 recreation days for the limited entry hunt. There is some concern that the practice of 2 or more hunters carrying firearms under the aegis of a single permit thus defeating the intent of the hunt, which was to limit numbers of hunters.

Chinook Salmon

A run of 4,000 to 6,000 Chinook salmon enter the Clearwater River beginning in early August. They arrive in numbers at the Horseshoe and Bailey's Chute in early September.

The viewing platform at Bailey's Chute is well used by tourists in fall and is probably one of the best places to view a Chinook salmon leap in the interior of the province.

The size of these salmon is impressive, with some exceeding 20 kg in weight.

The Clearwater River Chinook run is recovering from overfishing, but now supports a fishing season during August and early September. Most fishing for Chinooks takes place on the lower river, outside the corridor.

b. Secondary Features

The corridor embraces waterfalls, canyons, lava flows, basaltic columns, and tuyas, all indicating a volcanic past. Two of the waterfalls, Helmcken (465') and Dawson, are considered primary attractions of the park and could only be thought of as secondary features in the context of a wildlife viewing plan.

Animals considered as secondary viewing features include: mule deer, grizzly bear, pine marten, wolf, small mammals, several birds or groups of birds, and insects, particularly butterflies and dragonflies.

Mule Deer

The mule deer population of the park is estimated at 650 (Wildlife Branch, 1988). Over half of this population is found in the corridor during part of the year. Although mule deer may be seen with some regularity in the corridor, because of their occurrence and abundance through much of the interior of BC, they cannot be considered a prime viewing feature.

Deep snow usually prevents many deer from wintering in the corridor area. A few persist through the winter in sheltering stands of mature Douglas fir on breaks of the Clearwater and Murtle Rivers.

In summer, the population is augmented by deer that have wintered south of the park along the Clearwater and North Thompson Valleys. Most of the deer move to higher elevations but mule deer may be seen throughout the summer along the road.

Mule deer are hunted during a season that runs from September 20 to nearly mid-December. A yearly average of 190 hunters spend 760 days to kill 27 deer per year in the park (Hunter Sample, 1984 - 1988).

Pine Marten

There is a good population of pine marten along the entire corridor. This species has increased in abundance throughout the southern part of the corridor with the invasion and growth of conifers throughout the aging forest.

The elimination of trapping has also been a factor as this animal is easily trapped. Trapping tends to be concentrated along areas of easy access and the road was used as a trapline for many years.

This attractive animal is readily drawn to baits and could be enticed to visit sites heavily used by winter visitors.

Beaver

Beaver are found along all watercourses of the corridor where stream gradients permit construction of dams. Two of the viewing sites, Flatiron and Horseshoe, presently support beaver colonies. Unfortunately, beaver colonies are not static and beaver move on after they have depleted their food supply.

An interpretive theme for this species could be beaver the habitat maker. Descriptions of how other species use habitat components supplied by beaver, and how habitat created by a beaver dam changes over time, would be developed.

This is high interest in this species by park visitors, especially European tourists.

Grizzly Bear

Grizzly are seldom seen in the corridor but are regular visitors at the Horseshoe and Donald Creek at the time of the salmon run.

They sometimes visit hay meadows on Lot 2893 in spring and early summer, although it is rumoured that some grizzly have been killed illegally at that location. At one time, grizzly were occasionally seen at the Ray Farm in spring.

It is likely that the grizzly population of the southern part of the park was overharvested in the 50s and 60s.

Our impression is that grizzly sign and reports of grizzly in the corridor area have increased over the past few years, possibly an indication of recovery from overhunting.

Despite their small numbers, grizzly are potentially a wildlife viewing attraction at the Horseshoe in fall.

Wolf

Wolves are winter residents of the corridor, or at least regular visitors. There is often a pack whose activity is centered on the Murtle River from Stillwater to Pyramid, but which may invade ranches in the corridor south of the park border.

Although wolves are seldom seen in the corridor, tracks are not uncommon, especially in winter.

Birds

218 species of birds have been recorded in the park, with more than 100 of these occurring regularly in the corridor. Breeding bird surveys carried out by Rick Howie (1978 & 1989) along the corridor road found 523 and 696 individuals of 55 and 53 species. However, the area cannot be considered highly attractive as a birding area except during the warbler migration in May and early June.

Birds that should attract interest of park visitors who may not happen to be hard core birders include: osprey, grouse, owls, warblers, and what might be classified as campsite birds.

Osprey

Osprey may be seen at any of the larger waterbodies along the corridor, but are most consistently seen at the appropriately named Osprey Falls at the outlet of Clearwater Lake.

This raptor is admired by most tourists, unsuccessful fishermen excepted.

Grouse

Blue Grouse

Blue grouse are the least abundant of the grouse species, but may be seen in spring on open south-facing slopes of Green Mountain and the Flatiron.

Ruffed Grouse

Ruffed grouse are the most abundant of the grouse species in the corridor area. They are usually associated with deciduous stands, but may be seen throughout the corridor when broods disperse in the fall.

Drumming ruffed grouse are most commonly heard along the corridor south of the 'Green Timber'. Drummers are usually first heard on moonlit nights in mid-April but the peak of drumming is during the first week in May. During this period, drumming usually begins about a half an hour before daylight and drops off rapidly an hour or so after sunrise. In the evening, grouse are again heard drumming but the activity is not so intense.

By the end of June, grouse are silent as the male birds begin their annual moult. In the fall, a few birds may again be heard drumming.

Franklin (spruce) Grouse

Franklin grouse are increasing in numbers as conifers replace deciduous trees with advancing forest succession. They are most often seen in fall along the Pyramid and Green Mountain trails. This species is not commonly seen in much of the southern part of the province.

The cock bird performs a striking courtship display in the early morning and late evening during May and early June. He struts with tail feathers extended and elevated, and shows the brilliant red comb over the eye. Usually the display is carried out on a branch of a tree from which the bird may jump, bringing his wings together to make a sharp cracking sound.

Territories of the males are small in size and relatively constant from year to year. The locations of a few territories should be found and marked out. The courtship display would be of great interest to park visitors in early summer.

Owls

8 species of owls have been recorded in the corridor: Great Horned Owl, Northern Hawk Owl, Northern Pygmy Owl, Barred Owl, Great Gray Owl, Long-Eared Owl, Short-Eared Owl, and Northern Saw-Whet Owl. However, only two of these, Barred and Saw-whet, are common enough to be consistently heard at night from March through June. Saw-whet Owls are heard in the lower corridor around the ranches of Trout and Hemp Creeks, which the Barred Owl is heard in older timber stands beginning near the park entrance. Great Horned Owls are now scarce in the park, possibly because varying hares are at a population low.

Because of the interest in owls in the birding community, there may be an opportunity of promoting "owling" in the corridor when more is learned of their distribution.

Wood Warblers

13 species of these colourful birds have been recorded in Wells Gray Park, and 10 of these breed along the corridor. Wood warblers are most conspicuous on migration in early May, and while

singing on territory from then through June. Breeding bird surveys in the park have recorded locations and numbers of singing males along the corridor.

Campsite Birds

Campers' scraps frequently draw jays and chickadees to campsites in fall and winter. These birds provide a welcome bit of life to a sometimes dead campsite.

Mesh suet feeders should be put up at the winter viewing sites to attract birds such as jays, chickadees, nuthatches, and woodpeckers.

Small Mammals

Small mammals of the campsite, including Red Squirrel, Columbian Ground Squirrel, and Yellow Pine Chipmunk, attract the interest of many park visitors. All of these are present in abundance along the corridor in spring and early summer, although the ground squirrel is confined to openings in the forest.

The varying hare is subject to wide fluctuations in numbers and now seems to be recovering from a population low. They are often seen feeding on clover along trails and road rights-of-way.

INSECTS

Butterflies

Among the insects, butterflies are probably of most interest to tourists. They may be seen from April through October (Appendix 2). 30 species of 11 families have been identified along the corridor. Butterflies are often seen at puddles along the park road, especially where there are concentrations of salt. With the coming of paving and higher traffic volumes, the road will become less attractive to both butterflies and butterfly watchers.

Consideration should be given to provision of artificial puddles at parking lots to attract butterflies.

Dragonflies

The Wells Gray corridor contains some good habitat for dragonflies. These large and impressive insects apparently attract watchers whose hobby it is to observe dragonflies and damselflies.

Dragonflies and damselflies are seen in greatest abundance around boggy lakes such as Zellar's, Shadow, and Placid and, in lesser numbers, along creek and rivers.

Animal Tracks

Winter snow provides a good opportunity to practice the art of identifying mammals and their behaviour from tracks. Many of the mammals of the corridor are seldom seen, but their presence is made known by tracks in the snow.

Simple diagrams of tracks made by more common wintering mammals and birds should be provided in the self-guided brochures to be made available at viewing sites.

In addition to the selected wildlife viewing sites, Trevor Goward has identified an area on the Battle Mountain Trail, at the foot of the mountain, as being especially good for winter tracking. As well as being rich in tracks of the more common wildlife, the area intercepts a travel route of timber wolves.

VIEWING CALENDAR

The following viewing calendar could be used to assist visitors or prospective visitors to pick the best time to visit the park to see or hear a particular animal. It is followed by a verbal calendar that may further help visitors to understand reasons why animals may or may not be seen during a particular time period.

TABLE 2: WILDLIFE VIEWING CALENDAR

Wildlife Species or Group	Abundance by Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Black bear	5	5	4	3	2	2	3	3	3	3	4	5
Chinook salmon	5	5	5	5	5	5	5	4	2	1	3	5
Moose	2	1	3	4	4	4	4	4	4	4	4	3
Mule deer	4	4	3	2	2	2	2	3	3	3	4	4
Wolf	4	4	4	4	4	4	4	4	4	4	4	4
Coyote	4	4	4	4	4	4	4	4	4	4	4	4
Small mammals	2	2	2	1	1	1	1	1	1	1	2	3
Grouse	4	4	3	3	3	4	3	3	2	2	3	4
Warblers	5	5	5	3	1	1	2	2	3	4	5	5

Index of abundance: 1. Observed every trip. 2. Observed nearly every trip. 3. Observed 1 in 3 trips to 1 in 10 trips. 4. Observed less than 1 in 10 trips. 5. Not available for viewing.

SPRING

March: Moose begin their escape from the lower winter ranges to cooler sites and more productive foraging areas.

With daytime warming of the open sites, they tend to seek cover during daylight hours except during the cool of early morning and late afternoon. Winter coats are beginning to fade, especially on the back.

Wolf music is occasionally heard in the valley south of the park.

Early spring migrants arrive: bald eagles, crows, juncos, robins, and Canada geese. Crows seek out moose beds where they dine on engorged winter ticks.

On warm days, a few butterflies show up along the road.

April: Moose migration is in full swing and by the end of the month there are few moose left along the corridor. Tracks of the migrants are seen on shoulders of the road. Mule deer begin to work their way northwards to spread out over the park. A few black bears begin to wander from their dens, to feed on freshly-emerged skunk cabbage, green dandelions, clover, grass, or cottonwood buds.

Chipmunks and Columbia ground squirrels emerge from hibernation. Waves of white-crowned sparrows pass through the corridor late in the month, and the first orange-crowned and yellow-rumped warblers arrive.

May: The first deer fawns and moose calves arrive at the end of the month. There is fresh forage growing along the road, making this the best month for seeing deer along the corridor. Black bears are also seen grazing in meadows, roadside, and other forest openings.

May is the peak of migration for most passerine birds; warbler migration is impressive in mid-May.

The peak of ruffed grouse drumming is in the first week of May, while displays of spruce grouse tend to be a bit later in the month.

SUMMER

June: Mule deer in reddish-brown summer pelage are seen along the road. Black bears are courting and mating. This is the best month for seeing black bears along the road.

July: The larger mammals are hard to find in the corridor. You must look in the cool of early morning and late evening as most animals avoid the heat of the day.

Black bears feed heavily on ripening soapallies, Saskatoons, and huckleberries but are seldom seen from the road.

Birds that staked out and defended territories by noisy singing in May and June are now silent.

Osprey fish for rainbow trout at Clearwater Lake outlet.

August: Fawns begin to follow does. Chinook salmon show up at the Horseshoe.

This is the peak month for butterflies along the road. 11 of 13 species and groups of species listed in the Helen Knight butterfly calendar (Goward and Hickson, 1989) show up in August.

FALL

September: Osprey leave for south early in the month.

By mid-month, bull moose begin to roam in search of cows. Chinook salmon spawn at the Horseshoe; good viewing at Bailey's chute.

Fall colours of aspen and birch are brilliant by the end of the month.

October: Rut for moose is at its peak. Chinook salmon spawn and die. Black bears and Bald Eagles are sometimes joined by a grizzly at the Horseshoe, as they scavenge the last of the salmon.

Grouse from dispersing broods are seen along roads and trails in the park. Leaf fall from deciduous trees is complete at the end of the month. Goshawks and Great Horned owls will have good hunting for grouse in the suddenly opened stands.

November: Mule deer rut peaks early in the month. Migrating deer arrive from the high country. Black bears hibernate.

Varying hares change their coats from brown to white near the beginning of the month. If snow is late in coming, they are easily seen with their white coats against a brown background. Redpolls arrive from the north; in good years, their presence will be marked by debris on the snow where they have foraged for seeds of alder and white birch.

WINTER

December: A few moose arrive on Green Mountain. Old bulls have already shed their antlers.

January: Mule deer migration is complete. Moose are frequently seen on Green Mountain by the end of the month. Nearly all of the bulls are without antlers.

February: Moose in numbers can be seen regularly on Green Mountain. Wolves begin to visit the corridor more frequently. The Murtle River ice provides a wolf highway.

Barred and Great Horned Owls are heard at night.

c. Selected Viewing Sites

Bailey's Chute is a heavily-used wildlife viewing site featuring a Chinook salmon leap at an impressive and impossible rapid. It is already developed and familiar to parks managers, who have recommended that additional interpretive signs be placed at the site to explain the migration undertaken by the Chinook during its life cycle. We concur and have included it in the prioritized budget.

The following new sites have been chosen for their potential to be developed for wildlife viewing: Grassy Ridge, Flatiron vista, Placid Lake, Horseshoe, Ray Farm, and Shadow Lake/

Site Descriptions

Flatiron Vista:

Description: The Flatiron Vista is accessed along an easy 3 km trail that begins at the top of the Mailbox Hill, 29.9 km from the Wells Gray Information Centre. The trail is through dry lodgepole pine flats along an escarpment that, in places, drops sharply some 40 metres to riparian growth of willow, alder, and aspen along Trout Creek. It also overlooks flats of aspen and pine across the creek.

The trail ends at an open, south-facing slope, whose base is clothed in deciduous growth.

Viewing Opportunities: The principal species to be viewed from this site is the moose. Arriving in early to mid-January, and remaining until mid to late March, the moose is a highly visible citizen of the area. The combination of vantage points overlooking good habitat allows an excellent opportunity to view moose with a minimum of disturbance.

Winter viewing opportunities also exist for marten, coyote, wolf, squirrel, Stellar's Jay, Common Raven, Mountain and Black-Capped Chickadee, and Ruffed Grouse.

May and June present excellent viewing for several species of warblers that nest in deciduous stands along Hemp and Trout Creek. Species include: Northern Waterthrush, American Redstart, Orange-crowned, MacGillivray's, Yellow-rumped, and Yellow Warblers.

Black bear, deer, coyote, and occasionally moose are present in summer, but dense foliage inhibits their discovery by the viewing public.

There is an active beaver colony on Trout Creek below Silver Dollar Lake that could provide viewing opportunities through late summer and fall.

Developments Required:

Parking: The parking lot should be enlarged to handle buses as well as being moved to the top of the hill to provide safer and easier access to the lot. The present entrance, just below the crest of the hill, is unsafe and inadequate for heavy use.

Trail: The trail needs to be upgraded and rerouted to accommodate cross-country skiers and extended around the south end of the flats overlooking the Flatiron. Later a branch trail could be constructed across, to overlook Hemp Creek and Green Mountain. However, there is only one place you are able to see over the trees on the gentle slope, so this extension is not merited at this time.

The present trail has good drainage throughout its length, and, with upgrading, should be able to handle heavy foot, ski, and bike traffic, as well as moderate horse traffic.

Viewing Stations: The site requires 2 viewing platforms: one Type II along the trail, and one Type I (see Appendix 1) at the vista itself (Map 2). A pit toilet would also be required at the vista.

There has been a proposal to locate a research centre at the site chosen for the trail viewing station. Such a centre would be in conflict with viewing because of noise, human activity, and the potential risk of dogs harassing wildlife.

Habitat Management: In common with much of the park's winter ranges, browse productivity is declining here. A spot slash and burn program should be initiated to counteract the aging of existing habitat. Each December, areas of up to .5 hectares should have all deciduous growth felled, leaving snags and conifers for cavity nesters and cover. In spring, the felled material would be piled and burned. Moose would be attracted to feed on the tops in the winter. Regrowth would be attractive forage for deer in spring and would later produce forage for moose for 15 years or so.

This treatment could be carried out below the escarpment on the flats bordering Trout Creek and in the valley between the vista trails and the Flatiron. Windfall from a habitat improvement fire carried out in 1971 are still evident in the latter area, and this windfall could be burned in early spring with little danger to surrounding timber.

At present there is little moose utilization of the pine stands to the west of the trail on top of the hill. Browse there has long been overgrown by evergreens. The area should be logged to produce moose forage. Of course the logging would have to be carefully planned and executed to protect scenic values while producing an optimum mix of forage and shelter reserves for moose and deer. The timber is of merchantable size and would attract local contractors.

Parks managers have expressed concern over logging within the park's boundary chiefly because of anticipated negative public reaction to such activity. We believe that the proposal is sound from both a parks and wildlife management standpoint, but agree that getting acceptance from the public may be both difficult and costly.

Impact on wildlife: The proposed trails and viewing stations should have a minimal impact on wildlife. Moose and viewers are separated by the escarpment running along the length of the Flatiron Trail, and with increased visitation, the moose will easily habituate to the viewers.

Land tenure: The viewing stations are within Wells Gray Park, as is most of the area designated for habitat management. Some of the area proposed for habitat management is outside the park on vacant Crown land.

Interpretive Theme: The theme at this site would be the effects of fire on wildlife. The need for successional forests and the periodic burning of the land should be stressed, so the visitor views fire not so much as a destructive force but as a natural occurrence which allows different eco-systems to survive.

Recreational Opportunities: The Flatiron trail network provides excellent year-round recreational opportunities. From this trail, the visitor has access to Hemp Creek, Trout Creek, Coal Creek, Clearwater River, and Moul Creek. Built correctly, the trails to these creeks could accommodate hikers, horseback riders, and mountain bikers in summer, and cross-country skiers and snowshoers in winter.

Viewer Safety: In re-routing the trail, it is important to ensure that all down hill stretches point away from the escarpment. In areas where the trail parallels the escarpment, adequate railing should be erected.

Grassy Ridge:

Description: The Grassy Ridge site is located roadside 33 kilometres from the Wells Gray Park Information Centre. From this vantage point, you may see up to 15 moose on the slopes of Green Mountain from mid-January to mid-March.

Viewing Opportunities: In most winters, moose can be seen here consistently from mid-January until mid to late March. Migrating mule deer can sometimes be seen in November and December. Throughout the winter, there is a possibility of also seeing marten, coyote, and wolf, and well as the usual winter resident birds. There are deer, coyote, and black bear in the area in summer, but are seldom seen due to dense cover.

Developments Required: Parking for 12 vehicles; adjacent Type I viewing platform, wheelchair accessible; 20x power spotting scope fixed on mount (although moose may be seen on the mountain opposite with the naked eye, a 20x magnification is required for adequate viewing. The 7 or 8x binoculars carried by most viewers are just not good enough); two pit toilets.

Habitat Management: The slopes of Green Mountain were last burned in 1968, and browse production, although still fairly high, has declined in recent years. A spring burn carried out under proper conditions would kill the tops of some of the overgrown aspen and willow, and promote suckering. It is vital that any burning be done only under ideal conditions. Burning with too low a fire/weather index would only remove the limited fine fuels without scorching trees and shrubs, thus precluding a successful burn for many more years.

Impact on Wildlife: The proposed trails and viewing site should have minimal impact on wildlife. Moose and viewers are separated by Hemp Creek and close to a kilometer of valley.

Land Tenure: The viewing site is on Lot 3179, which is vacant Crown land.

Placid Lake:

Description: The Placid Lake site would be located approximately 250 metres along the existing Placid Lake Trail. Located in a mature interior cedar hemlock moist forest, this site would introduce the viewer to wildlife habitat of the climax forest.

Viewing Opportunities: A number of mammals frequent this area throughout the year, but they present a low viewability. Black bear and deer are frequently seen here in spring. Snowshoe hare, Ruffed and Spruce Grouse, red squirrel, and pine marten are year-round residents, while winter bring opportunities to see signs of wolf, moose, marten, lynx, and cougar. Owls (Barred and sometimes Great Horned) can be heard throughout early spring. The site would also introduce the visitor to small mammals, amphibians, and insects of the interior western hemlock forest.

Developments Required: A Type II viewing platform and a loop trail of about 250 metres would allow the visitor to see the range of plant species with a wet belt forest, and to illustrate the concept of forest succession.

Habitat Management: A winter baiting program (small amounts of meat secured in trees) might be considered here, to attract fur bearers such as pine marten and weasels of 2 species.

Impact on Wildlife: The proposed trail and viewing site should have a minimal impact on wildlife.

Land Tenure: All park land; no other alienations.

Recreational Opportunities: The Placid Lake Trail, if improved, would provide good hiking and skiing for the wildlife viewer.

Viewer Safety: A major concern for safety in this area is the problem with old growth timber, and dead tops and branches. A 'dangerous tree' program should be implemented to identify all potential hazards and remove them when necessary. (Note: a local resident, George Briggs, has had experience in this field.)

The Horseshoe:

Description: The Horseshoe site is located in a 100 year old stand of paper birch on a high bank overlook the Clearwater River. It is a 5 minute walk downstream from the Horseshoe parking lot.

Viewing Opportunities: In the early part of the Chinook run, salmon can be seen making their way upstream to spawn. Later, dead and dying salmon lie at the bottom of the river in the slack water of the pool below the site. Ravens, bald eagles, and sometimes a golden, scavenge dead and dying salmon. They are joined by mergansers who dive for eggs as well as eating decaying salmon.

Black bears and sometimes a grizzly come to the Horseshoe for the salmon run.

Developments Required: Parking would be required for 2 tour buses. A Type I viewing platform should be constructed atop the bank, with a view up and down the river (Map 2). A 500 metre trail from the parking lot to the viewing platform should be wheelchair accessible. 2 pit toilets should be constructed at the parking lot.

Ray Farm:

Description: The abandoned Ray Farm is accessed by a Class II trail from 54.5 km of the park road. The farm still has several acres of open pastureland that is reverting to forest. The barn,

root house, and farmhouse still stand. There are two mineral springs south of the buildings that attract a variety of animals.

Viewing Opportunities: Black bears graze in the abandoned hayfields in spring and early summer.

Mule deer, black bear, and moose are sometimes seen at the mineral springs, but more common visitors are birds, including Evening Grosbeak, Red and White-winged Crossbills, Pine Siskins, and Pine Grosbeak.

Columbia ground squirrels are common around the buildings, and woodchuck have been seen here on occasion. Red-tailed hawks consistently hunt ground squirrels until their prey hibernates in late summer.

The farmhouse is home to a colony of Barn Swallows and one of Little Brown Bats.

Developments Required: A self-guiding brochure should be developed for the site, to point out wildlife viewing opportunities and natural features of the area.

Habitat Management: Fertilizing, reseeding grass, and spring burning should be carried out on selected parts of the hayfields to attract black bears and mule deer.

Impact On Wildlife: The increase in visits brought to the Ray Farm by a self-guided viewing trail should have little impact on wildlife.

Land Tenure: Park land.

Recreational Opportunities: Hiking, picnicking, historical appreciation, and drinking from the mineral spring are common activities, besides wildlife viewing.

Viewer Safety: The only consideration is bear/human interaction which, due to the spring hunt, is not a major concern as most bears have a healthy fear of humans.

Interpretive Theme: The primary theme should be how man's incursion of the wilderness has changed the ecology of this area, and how it is slowly reverting to its original state.

Shadow Lake

Description: Shadow Lake is a shallow, productive, wasp-waisted, glacial lake of about 15 hectares north of the park road at 60.7 km. It is surrounded by a young mature forest on gently sloping hillsides. The shore has a willow alder border of varying width.

Viewing Opportunities: Black bear, muskrat, mink, marten, moose, Common Loon, and Barrow's Golden-eye are all found at the lake at various times. Aquatic invertebrates and bog-dwelling insects would also be attractive for viewing. We have not visited this site recently, and observations are based on memory. Discussions with a number of individuals indicated that a water-based viewing site would be well received by the viewing public.

Developments Required: Parking site for 12 vehicles; a boardwalk of approximately 300 metres to take visitors along the marsh; 500 metres of trail from the parking lot to the boardwalk; 2 pit toilets at the parking lot.

Impact On Wildlife: Additional visitors to Shadow Lake should cause little more disturbance than fishermen already using the land.

Land Tenure: Park land.

Recreational Opportunities: The lake offers fair fishing.

Viewer Safety: The boardwalk should be constructed with a secure railing.

Interpretive Theme: The interpretive theme for this site would have to be water, and how it is integral to all life.

E. INTERPRETIVE THEMES

The following are suggested as possible interpretive themes for primary and secondary viewing features. The adoption of a theme will of course depend on the resources available for interpretation, as well as personal preferences of those who will be carrying out the work.

Black Bear: Bear the omnivore. The emphasis would be on the varied food habits of the black bear, similarity to man in food habits, and conflicts with man.

Moose: Moose habitat. Requirements of summer and winter habitats would be described; foods, snow depths, cool sites for summer, and escape terrain.

Chinook Salmon: Salmon migration. Description of life cycle as related to migration and the importance of salmon migration in nutrient transport from ocean to river.

Mule Deer: Mule deer and snow. Description of how snow restricts distribution and abundance of mule deer in Wells Gray Park, British Columbia, and North America.

Beaver: Beaver the architect of change. Description of how other species uses habitat components created by beaver, and how beaver habitat changes over time,

Pine Marten: Pine cones and pine marten. Description of how marten are dependent on small mammals for food, and how small mammals are linked to seeds of conifers.

Grizzly Bear: Grizzly, wild spaces, and man. Description would be of the history of man/grizzly conflicts and the importance of wilderness areas, such as Wells Gray Park, in grizzly conservation.

Wolf: Predator prey interactions. Description of how moose and mule deer control populations of wolves, and conversely.

Osprey: Osprey and pesticides. Description of how osprey populations declined in the wake of pesticides accumulation at the top of the food pyramid, and how they have recovered since pesticide use has been controlled.

Grouse: Habits and habitats of 3 species of grouse. Description of how ruffed, spruce, and blue grouse select habitats within the corridor, and what key foods support each species.

F. VIEWING FEATURE SENSITIVITY

Many of the larger mammals and/or birds of the corridor are hunted, and so are more apt to flee/fly at the approach of humans than wildlife in National Parks. While this makes viewing more difficult, the experience of seeing a wild animal is much higher quality than seeing a tame animal of the

parks. The moose and caribou that I saw along the Banff - Jasper highway last spring were less "wild" than some range cattle around Kamloops.

It is also important to maintain the "wild" character of wildlife habitat. Therefore, habitat improvement for ungulates should favour prescription burning over mechanical manipulations wherever possible.

Wildlife quickly adapts to disturbances in order to minimize energy expenditure, so wintering ungulates habituate to humans provided they are not pursued or shot. However, when pursued, they are apt to leave an area for one less subject to disturbance. Moose could easily be chased out of a viewing site if pursued by photographers or hunters.

Domestic dogs are another problem to be faced by wintering ungulates. Although they seldom kill moose, dogs can haze them out of favoured feeding areas. Uncontrolled dogs were a problem on two previous habitat improvement projects.

There is a good population of dogs at ranches and other dwellings at the south end of the corridor near the Flatiron. These dogs have the potential of seriously impairing the value of the Flatiron as a viewing site.

G. LIMITATIONS TO VIEWING USE AND USER CAPACITY

Numbers of wildlife viewers using the park will be limited by:

- (1) The lack of any single outstanding wildlife feature.
- (2) Vegetation that obscures wildlife viewing.
- (3) Wildlife that tends to migrate out of the corridor during summer, which is the peak tourist season.
- (4) The long distances at which moose and black bear must be viewed.

It is not anticipated that a need to protect viewing features will be a factor limiting the numbers of users during the next few years. However, numbers of viewers at a site at a time should be kept low, to maintain the quality of the experience. A honky-tonk atmosphere would be incompatible with viewing.

It is anticipated that the greatest increase in park visits due to the viewing program will come in the shoulder seasons or during winter. Therefore, supporting park facilities such as campsites, or accommodations outside the park, now available will serve the viewing program merely by increased activity during the off season.

On site capacity may be limited at the Shadow Lake site.

H. VISITOR AND FACILITY MANAGEMENT

The success of a wildlife viewing program will depend not only on an abundant wildlife resource, but on facilities to aid in finding and appreciation of wildlife.

In a large part, the facilities needed for a wildlife viewing program are already in place in Wells Gray Park. The few recommended additions are mainly to enhance opportunities for fall and winter viewing.

Interpretation programs have long helped users to appreciate natural features in Wells Gray Park. The new wildlife viewing program has a similar objective and could be considered as a part of interpretation. Or the converse.

At any rate, the wildlife viewing program should include a large measure of interpretation while the interpretive program should promote the viewing program.

In its initial stages, the viewing program should be entirely based on self-guided trails and brochures for interpretation during the off season. These trails would have numbers at habitat components of the species to be viewed, with a brochure containing descriptions of the numbered points of interest. The brochures would be simple and inexpensive, but would have a pick up and a return box for maximum economy.

Visitors to viewing facilities will have to be educated to remain at viewing sites or on trails in order to protect wildlife from harassment. Of equal importance is to leave undisturbed wildlife for others to see.

Dogs must be controlled if a problem. There is a Conservation Officer at Clearwater who is empowered to destroy dogs harassing wildlife.

Parks should anticipate, or at least react quickly, to changes in seasonal use patterns brought on by the wildlife viewing program. For instance, the demand for winter camping could increase as wildlife viewing becomes more popular. Snow plowing and maintenance of the Dawson Falls campsite would then be necessary.

Seasonal sites should be signed only for the time at which wildlife will be viewed. For instance, the Grassy Ridge and Flatiron sites should be signed from mid-December through March, while the Horseshoe site would be signed September through November.

Where practical, viewing facilities should be made wheelchair accessible. Grassy Ridge could easily be made so, even for winter use, while Horseshoe and Ray Farm would be wheelchair accessible fall and summer, their intended use periods.

Viewing structures should blend with the landscape and not be overbuilt. Viewing sites have been chosen to take advantage of topography obviating the need for viewing towers.

I. WILDLIFE AND HABITAT MANAGEMENT

1. Hunting and wildlife viewing

Hunting has the potential to influence the opportunity for viewing in several ways:

- (1) Populations may be temporarily or permanently reduced.
- (2) Age structure of the population may be altered.
- (3) Behaviour of animals may be altered.
- (4) The activity of hunters may be perceived as dangerous or distasteful by some viewers.

Because there is little access for hunters in the park, and because hunting regulations in recent years have been conservative, the hunter kill of game has been too small to influence the populations of moose or of mule deer. Recent annual moose harvests of about 36, and mule deer harvests of 27, represent about 4% and 4.2% of the estimated populations of moose and deer (Table 3).

TABLE 3: ESTIMATED NUMBERS, HUNTERS AND ANNUAL HARVESTS OF HUNTED WILDLIFE IN WELLS GRAY PARK, 1984 - 1988

Species	Estimated numbers	Estimated hunter kill (%)	Estimated hunters	Estimated hunter days
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black bear	430	2 (0.5%)	15	60
moose	820	36 (4%)	225	850
mule deer	650	27 (4.2%)	189	763

Tooth collections from the limited entry hunt indicate that Wells Gray moose are significantly older than moose in the rest of Wildlife Sub Region 3. There is no evidence that hunting has altered the age composition of the extent that there is a shortage of mature animals for viewing. The mean age of bulls taken during the L.E.H. for the past 10 years is 4.0; of cows, 7.5. The records suggest that average ages of the kill are increasing, further indicating that hunting is not having a significant effect on age distribution.

There is no doubt that the hunted wildlife species in Wells Gray Park are much more wary of people than animals of the same species in National Parks. Like it or not, wariness from man the hunter is part of what separates wildlife from domestic animals. Seeing animals that are truly wild is a higher quality experience than viewing animals in a zoo, or looking at the 4-legged popcorn-eaters often seen in urban or suburban centres of our National Parks.

However, most park visitors probably do not appreciate the subtle differences in quality of viewing experiences. To them, a moose is a moose is a moose, and their main objective is to see one. There can be little argument that increased wariness brought on by hunting decreases, to some degree, the chance of seeing some of the larger species of wildlife within the park.

Hunting is recognized as a legitimate recreational pursuit in British Columbia Provincial Parks, one that can be defended ecologically and socially. Its defense, though, becomes ever more difficult as more and more emphasis is placed on viewing wildlife in parks.

2. History of Hunting in Wells Gray Park

Hunting has been a part of Wells Gray Park since its inception in 1940. All species of wildlife (designated as such by the BC Wildlife Act) in the park have been subject to trapping or hunting at one time or another.

Prior to 1952, regulations regarding hunting for Wells Gray Park were the same as regulations for the rest of interior British Columbia. In that year, hunting of antlerless moose became legal and subsequent years saw a rapid increase in the numbers of hunters and the size of the kill of wildlife.

Peak kills of moose (284) and mule deer (104) for the years 1952 through 1962 (Table 4) were roughly 8x and 4x present harvests for these species. An average of 2,450 moose hunter days per year were recorded for the period, or roughly 10x the average for recent years.

TABLE 4: SUMMARY OF HUNTING SEASON DATA, WELLS GRAY PARK, 1952 - 1962

Year	Hunters	Harvests			Moose Hunter Days
		Moose	Mule Deer	Black Bear	
1952	828	109	17	4	1363
1953	660	127	21	3	1867

1954	466	99	21	9	1663
1955	468	146	21	4	1066
1956	799	244	15	7	1830
1957	1221	242	36	5	2638
1958	1266	284	36	2	2755
1959	1536	209	98	6	3031
1960	1295	176	70	6	2816
1961	1455	264	104	2	3775
1962	2062	222	99	14	3397
11 year average	1100	193	49	6	2451

Some early conservative regulations introduced in the park protected black bears from summer hunting and protected timber wolves from the poison program that was sweeping the province in the 1950s. Present regulations protect the park's grizzly bear, cougar, wolf, coyote, fox, skunk, bobcat, lynx, and wolverine from hunting throughout the year.

In 1975, the Murtle Lake Nature Conservancy was recognized in the hunting regulations as M.U.3.45 and hunting became illegal in that part of the park. Unfortunately, 13 years later a significant number of hunters still reported hunting in 3.45 in their hunter sample returns.

Hunting in Wells Gray Park has been increasingly controversial since the introduction of limited entry moose hunting in 1976. Ironically, the limited entry hunt was part of a more conservative strategy for controlling the moose harvest and, more importantly, the total number of hunters using the park.

Prior to limited entry, M.U. 3.46 remained open to moose hunting after most moose hunting seasons were closed in the southern part of the province. This attracted large numbers of moose hunters to Wells Gray Park, and caused problems for park management to service hunters at this time of year.

The hunt is popular among hunters, with 480 applicants vying for 50 permits in 1988, the last year for which the statistic was available. It is carried out in a period when other park use is at a minimum, so there is little conflict between hunters and other users.

The general moose hunting season in Wells Gray Park now runs for only 22 days in October, and the annual harvest, including that of the limited entry hunt, averages 36 per year.

The limited entry hunt occupies 7 days in early January. An average of 30 hunters participate (successful hunters during the regular season cannot use their permits during limited entry hunting) along with companions.

In 1990, regulations for the Wells Gray Limited Entry Hunt for moose prohibited hunting within .3 km of the road into the park and the road to Helmcken Falls.

Reduction of hunting on moose already has had an effect on the visibility of this animal, and it is likely that less than half the population is now exposed to hunting.

3. Recommendations on Hunting

- (1) Dates for the open season for moose and mule deer, valid for the 1989-90 hunting season, should remain in effect for the next five years unless more restrictive regulations are introduced in adjoining management units.
- (2) Limited Entry Moose Hunting regulations should allow hunting for 7 days, beginning on January 3 each year. In most years, moose do not arrive at viewing sites of Flatiron and Grassy Ridge until mid-January, after the end of the Limited Entry Hunt. Usually then, there is little direct conflict between viewers and hunters. However, in years of deep snow, moose are readily seen from the Grassy Ridge site at the time of the L.E.H., and sometimes concentrate on the Flatiron in similar situations.

Hunting should be excluded from the Flatiron viewing sites and from Green Mountain across from the Grassy Ridge viewing site during L.E.H. season, to prevent potential conflict. (Hunting is already excluded from the Grassy Ridge itself by regulations brought in for 1990.) This could be done by specific exclusions of these areas on the permit, and by instructions during the required check-in before hunting.

- (3) The fall black bear hunting season should be closed, and the spring season run from April 1 to May 31, rather than the present April 1 to June 15. The present fall harvest of bears is light, but hunting pressure is sufficient to keep the bears nocturnal while feeding along the river on Chinook salmon. There are a few more spring bear hunters, and it is possible that their activity may reduce bear problems in the park during summer. An experimental early closure of the spring season should show if this significantly added to the opportunity of viewing bears in early summer without an accompanying increase in nuisance bear problems.

Although nuisance bears have not been a significant problem in recent years, there is potential for them to be so. In the summer of 1971, a year when the berry crop failed, at least 10 nuisance black bears were destroyed at the dump. Even after this number had been eliminated, it was possible to see 8 bears at a time at the garbage dump.

4. Habitat Manipulation

Habitat manipulation may be used to increase numbers or productivity of animals in a population or to attract them to place where they may more readily be viewed. Most of the park's winter ranges for moose reach their highest productivity in the wake of fire. Available browse drops off rapidly as burns mature. The large burn which sustained peak moose populations in the 1950s and 60s is now over 60 years old.

Prescribed burning carried out in the period 1966 - 1971 showed that this could be an effective means of improving productivity of moose and deer ranges on dry, south-facing slopes. The burns are now 20 years old and some of these should be burned again. Browse production has fallen because shrubs are becoming decadent and are being shaded out by taller trees.

The south slopes of Green Mountain could easily be burned in spring before surrounding timber stands are dry enough to present a hazard. There would be no need to construct a fire guard as the fire would merely run uphill to where the understory would be too wet to carry the fire. This work is necessary to slow the rate of decline of moose and deer numbers.

Other wildlife to benefit from burns would be black bear, blue grouse, ruffed grouse, and mountain bluebirds.

Over much of the winter range it is impractical to use prescribed burning as an enhancement technique because the cover just won't burn except in the most hazardous conditions.

Leopold (1933) proposed a theorem stating that the recreational value of wildlife is inverse to the artificiality of its origin, and hence in a broad way to the intensiveness of the system of game management which produced it. The present park wildlife populations are largely natural and highly attractive to persons interested in viewing them. However, some manipulations may be necessary to enhance opportunities for people to view wildlife.

Slashing of tall willows and aspens has proved to be effective in stimulating browse production and in attracting moose to feed on tops. This is not recommended for large areas as it is very labour intensive work which creates an unattractive landscape. However, for small areas where a good cleanup can be done, it may be recommended.

Slashing on nearby corral rights in the 70s still supports 2,800 moose days per year on a square mile basis. (Data from Doug Jury, Wildlife Branch)

Salt licks: Moose and deer regularly visit salt licks in the park. Most intense use is in early summer when nutrient demands are highest on the animals. There are natural licks at Ray Farm and Redspring, which already attract animals. These could be augmented with other artificial licks placed near wildlife crossings of the park road. There is little danger that these licks would make moose and deer more vulnerable to hunters as their demand for salt is very low during the fall hunting season.

Birds are also attracted to salt and sand mixed with salt. Providing the salt-sand mix at south facing road cuts would be an effective means of attracting birds such as crossbills, siskins, and redpolls, especially in winter.

J. PUBLIC SAFETY

Motorized traffic entering or leaving parking lots at viewing sites is the only potential hazard of any significance in the viewing program. Standard traffic control signs must be installed, to alert traffic approaching or leaving the parking lots. Pullouts for parking should be visible from a distance, not on blind curves as at the Flatiron trailhead.

Bear attacks are always a remote possibility in back country, but viewers will be well away from the bears at the two sites (Horseshoe and Ray Farm) where these animals are most likely to be encountered. Bear warnings, standard to the park, will be sufficient to protect the viewing program.

The trail to the Flatiron viewing site borders an escarpment where there is the potential danger of falling. The danger here is slight and can be overcome by a railing in the final location of the trail is close to the edge of the escarpment.

K. MARKETING

A number of marketing options are available to promote the Wells Gray Viewing Program. Those which follow are relatively low cost options that can be quickly designed and implemented.

- (1) **Road signage:** The common logo being developed for the viewing program should mark the trailhead to all viewing sites. The signs should indicate the length of trail, degree of difficulty, target species, and prime viewing time/seasons.
- (2) **Brochure of the viewing program:** A brochure of the Wells Gray Corridor viewing program should be published, to outline the attractions available. The brochure would include a sketch map of locations of developed viewing sites, wildlife features available, and a calendar of best times to view the sites. It would also outline, in a more general way, wildlife viewing opportunities within the corridor as a whole.
- (3) **Viewing calendar:** The calendar would detail the month to month viewing opportunities within the park. It would be distributed to all news media, the information centre, and local retail establishments. The calendar could be augmented with a "recent sightings" bulletin at the information centre, which could highlight noteworthy wildlife sightings within the park.
- (4) **Direct mailouts to tour operators:** Brochures and viewing calendars should be sent to all tour operators that use the Yellowhead Highway, to encourage them to incorporate the Wells Gray wildlife viewing program into their itinerary.
- (5) **Wildlife vignettes:** A series of wildlife vignettes could be prepared and run on CFJC, similar to the ones already running on general interest aspects of the park.
- (6) **Monthly columns:** Park naturalists should be contracted to produce monthly articles on the wildlife viewing opportunities within the park, and these columns submitted to the local news media.
- (7) **Special events program:** Events such as the Wells Gray Christmas bird count should be augmented by establishing others such as wolf howling, night owling, moose counts, wildlife track identification and track counts. These events could generate a steady flow of visitors to the park on a regular basis (especially during the normally slack winter months.)

L. RESEARCH AND INVENTORY

There is an excellent inventory base available for wildlife habitat in the corridor in the Ministry of Environment 1988 Biophysical Mapping of Wells Gray Park. There has been a good inventory carried out on the moose population in 1984, and the distribution of mule deer winter ranges is fairly well known. Breeding bird surveys and Christmas bird counts have documented distribution and abundance of bird species in the corridor. In all, there is a fairly good inventory of wildlife in the corridor and the park as a whole, compared to much of the province. One obvious need for inventory is that of a small mammal inventory. There has been little done on this in the park since some pioneer work by P.W. Martin (1950) and R. Webb (1952). Of particular interest would be a survey of the bat population.

It is important to a viewing program that knowledge of the wildlife resource be kept up to date and every encouragement should be given to continue annual breeding bird surveys and Christmas bird counts.

Since moose are an important part of the viewing program, it is important to keep records of their available for viewing. Boxes with brochures could also have forms for viewers to record moose sightings. The information could be put on a data base that could be used to give more information on dates for best view ability. It would also indicate the degree of success of habitat improvement projects aimed at increasing moose in the viewing area.

Outlining opportunities for research projects is beyond the ken of the authors.

M. DEVELOPMENT PLAN AND BUDGET

Full implementation of this plan would cost in the order of \$217,000. As it is possible that all of this money may not be available, the sites have been listed in order of priority for development, after weighing the merits of each site. Bailey's Chute is included in the 5 year budget of Table 4, but not in the following list because it is already a developed site.

Priorities for Site Development:

1. Grassy Ridge: dependable viewing opportunities; will attract off season use with low capital spending or maintenance expense. Low wildlife diversity; short season of use. Low secondary viewing features.
2. Ray Farm: diverse wildlife available; season of use mostly during peak of tourist season; very low capital spending and maintenance. Moderate secondary viewing features.
3. Flatiron: moderately dependable viewing opportunities; will attract off season use; long season of use; high secondary viewing features and recreation values. Balanced against high cost of development and maintenance.
4. Horseshoe: dependable viewing opportunities; moderately long season of use; moderate diversity; secondary viewing features; recreation values.
5. Shadow Lake: dependable viewing opportunities for secondary viewing features; high diversity and moderate recreation values. High cost.
6. Placid Lake: uncertain viewing opportunities for both primary and secondary features; moderate diversity. Low cost.

Table 5: EXPENDITURES REQUIRED BY VIEWING SITE

Item	Grassy Ridge	Flatiron	Ray Farm	Horseshoe	Shadow Lake	Placid Lake
viewing platforms	\$5,000	\$13,000	\$0	\$6,000	\$0	\$3,000
pit toilets	\$3,000	\$1,500	\$0	\$3,000	\$3,000	\$0
trails	\$0	\$15,000	\$0	\$4,000	\$30,000	\$4,000
scopes	\$4,500	\$4,500	\$0	\$0	\$0	\$0
parking	\$4,000	\$4,000	\$0	\$4,000	\$4,000	\$0

self-guided trails	\$2,000	\$3,000	\$2,000	\$3,000	\$2,000	\$0
habitat improvement	\$6,000	\$18,000*	\$2,000	\$0	\$0	\$0
road signs	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
TOTALS:	\$24,500	\$60,000	\$7,000	\$21,000	\$42,000	\$11,000

* over 5 years

Some budgeted items cannot be assigned to a specific site but have been covered in Habitat and Marketing sections of the report, and here are included in the budget prioritized for time but not versus Site Items. The development plan was proposed as logical, but there may be practical reasons for moving items backwards or forwards in time.

Table 6: 5 YEAR BUDGET, WELLS GRAY VIEWING PLAN

Year	Site	Cost	Items	Non site items	Total
1990	Gr	\$18,500	PI,Pi,Sc,Pa,Ro		
	Fi	\$10,800	Pa,Se,Ha,Ro*		\$29,300
1991	Gr	\$6,000	Ha	Habitat \$7,000	\$72,700
	Fi	\$40,800	PI,Pi,Tr,Sc,Ha	Brochure \$5,000 Mailouts \$300 Columns \$3,600 Vignette \$5,000	
1992	Ra	\$7,000	Se, Ha, Ro	Mailouts \$300	\$44,700
	Ho	\$21,000	PI,Pi,Tr,Pa,Se,Ro	Columns \$3,600	
	Sh	\$3,000	Pa	Habitat \$7,000	
	Fi	\$2,800	Ha		
1993	Sh	\$39,000	Pi,Tr,Se,Ro	Mailouts \$300	\$45,700
	Fi	\$2,800	Ha	Columns \$3,600	
1994	PI	\$11,000	PI,Tr,Se,Ro	Mailouts \$300	\$24,700
	Fi	\$2,800	Ha	Columns \$3,600 Habitat \$7,000	

TOTALS	\$165,500	\$46,600	\$217,100
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* site and cost item abbreviations:

Sites: Bc - Bailey's Chute; Fi - Flatiron; Gr - Grassy Ridge; Ho - Horseshoe; Pl - Placid Lake; Ra - Ray Farm; Sh - Shadow Lake

Cost items:

Ha - habitat improvement; Is - interpretive sign; Pa - parking; Pi - pit toilet; Pl - viewing platform; Ro - roads; Sc - spotting scope; Se - self-guided trails

N. REFERENCES

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O. PERSONS CONSULTED

TABLE 7: PERSONS CONSULTED RE. VIEWING PLAN, WELLS GRAY CORRIDOR, AND SUMMARIES OF INTERVIEWS WITH COMMERCIAL OPERATORS

Name	Affiliation
Monty Downs	Parks District Office
Rick Howie	Parks Region Office
Pat Rogers	Parks Region Office
Earl Sinclair	Parks, Wells Gray Zone Office

Paul Arduini	Clearwater Lake Tours
Beverley Louwerse	Helmcken Falls Lodge
Mike Mueller	Stoney Mountain Outfitters
Trevor Goward	Friends of Wells Gray
Helen Knight	Friends of Wells Gray
Bob Miller	retired BCParks; Canada Fisheries
Dave Low	Wildlife Branch
Kurt Kier	Wildlife Branch
Doug Jury	Wildlife Branch
Mike Ritcey	hunting fraternity

Interview with Beverley Louwerse, Helmcken Falls Lodge:

Helmcken Falls Lodge caters to 1,000 visitors per year who are interested in wildlife viewing. The Lodge has a program which takes visitors to specific areas to view wildlife both summer and winter. Species in demand for viewing include, in the highest category: black bear and moose; these are followed by beaver, coyote, wolf, and salmon; while lower on the list are grizzly, mule deer, eagle, osprey, owls, marten, fisher, and lynx.

General comments: (1) Wildlife is the #1 reason for people visiting Wells Gray Park. (2) Wells Gray Park is known and famous for its wildlife. (3) More money has been spent on wildlife, habitat, geology, and botanical (studies) than any of the BC Parks, yet visitors still cannot see the wildlife.

Interview with Paul Arduini, Clearwater Lake Tours:

Clearwater Lake Tours is essentially a water taxi operation that does not stop to point out wildlife features. He would like to see the spring bear season closed, so that people would have an opportunity to see more bears.

APPENDIX 1: VIEWING PLATFORM DESCRIPTIONS

Type I: A Type I platform is designed for heavy use and should be able to accommodate upwards of 18 people at one time. The structure would be wood post and beam construction with a large overhanging roof which would protect the otherwise open shelter. Within the shelter there would be permanent signs describing the target species and how they relate to the theme of the site. Railing would be designed to accommodate spotting scopes and camera mounts. Where natural windbreaks are not available, the structure could have paneled sides to slow crosswinds somewhat.

Type II: A Type II structure is a simple structure designed to hold no more than 6 people at one time. These structures are completely open and offer only a level spot (often slightly raised) to view wildlife from. These structures would also have a railing designed to offer a steady resting spot for cameras and spotting scopes.

Designs of individual structures should be unique to each site and should be conceived with an idea of blending into the environment as much as possible (not the standard institutional square box in the round hole approach to architecture.) Natural materials should be used whenever possible, and structures should be as unobtrusive as possible.

APPENDIX 2: WELLS GRAY BUTTERFLY CALENDAR (Helen Knight in Nature Wells Gray - Goward and Hickson, 1989)

Families and species	April	May	June	July	Aug	Sept	Oct
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Admirals			+	+	+		
Angelwings	+	+	+	+	+	+	
Blues	+	+	+	+	+		
Mourning Cloaks	+	+	+		+	+	
Coppers				+	+		
Crescents				+			
Fritillaries				+	+	+	
Wood nymphs				+	+		
Skippers					+	+	
Sulfurs		+	+	+	+	+	
Swallowtails		+	+	+			
Comma Tortoiseshell	+			+	+	+	+
Whites	+	+	+	+	+		