

VERMILION LAKES

VERMILION LAKES
BANFF NATIONAL PARK

an introductory study

Bow Valley Naturalists

(with the support of Parks Canada)

1978

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TABLE OF CONTENTS

INTRODUCTION	
The Area	1
The Study	2
RECOMMENDATIONS	4
HUMAN HISTORY AND RECREATIONAL USE	
Settlement of the Banff Area	7
Early Reports	8
The Railway	9
Early Management	9
Hay Harvesting	10
Grazing	11
Mosquito Control	12
Fish Stocking	12
Recreation	14
Current Recreational Use	16
GEOMORPHOLOGY	
Introduction	19
Physical Features	21
History	22
VEGETATION	
Introduction	25
Plant Communities	25
Annotated List of Vascular Plants	27
BIRDS	
Introduction	36
Annotated List of Birds	38
MAMMALS	
Introduction	51
Annotated List of Mammals	52
REPTILES AND AMPHIBIANS	
Introduction	62
Annotated List of Herptiles	63
FISH	
Species List of Fish	65
REFERENCES	66



Osprey at First Vermilion Lake

Keith McDougall

After the edge-merging wedge of the confluence,
Echo Creek, Willow Creek, Willow River, Forty-Mile hearken;
scholastically rheotropic minnows constantly shivering
under the sponson bulges in the fluid clear darkness.

Reaching by roundabout route, by reeds, by brush willows,
the spruce-bordered tea-coloured amniosis existing
in edge and reflection, beaver pond, the many world
wind gentle place where the hazy horizon persists.

As a projected transparency comes into focus
a place familiar from alternate experience converges
all ways varying, a slightness of distinction
on the way; the means of approach matters:
the discrepancy of the ideal and the spatial reality--
just a position it seems--of the lakes
is the gap the lakes filled when I was four
and discovering minnows and muskrats and moose.

Other ways after: over the railway bridge, by Willow Creek
to the beach of First Lake to skinnydip, unmindful
of towels; two girls, their canoe a destroyer,
alien to our nakedness, languorously hovered
an afternoon's hour we hid behind spruce trees.

In brisk bright November, skates slung on our shoulders,
by the tracks to skate through the tufts of sere
rushes on the thin, clear, dark ice, ascared,
the pressure lines cracking and slumping beneath us
on bubbles that sidled and luxuriously heaved.

Moonset: filaments of mist, cold flames, wisp the lin
like tufts of clematis, a beaver v's the pond,
the pale pink sky is cloudless, cold, a crystal chill
and she and I await the mountain dawn on Fairholme,
the day's crescendo and reflections still.

Neither stillness, nor shoalwaters, nor shorelines,
nor depth, nor reflections, nor points of view define
these lakes' extra-dimensional faces in time;
living and dying: the reddening willows
of midwinter, beloved by Tom Lonsdale;
coyotes' tracks on the piebald plane of spring;
madge greenness of midsummer, wedge of osprey;
the swift pursuit of the cadmium autumn.

By lacunae of copses, by mud-slickened sedges,
all diversifies, yielding, seething in selions,
horsetails and waterbirds, margins and edges,
lakeways of mindedness, richness: Vermillions.

Jon Whyte

INTRODUCTION

The Area

The Vermilion Lakes consists of three major and numerous minor flood plain lakes along the course of the Bow River. They are situated a short distance upstream from the Banff Townsite and are part of an extensive wetland, valley bottom area which lies on both sides of the Bow River. They occupy an area of some 440 hectares, north of the river to the slopes of Mount Norquay. The Bow Valley at this point, has taken a northward trend prior to the river spilling over Bow Falls and continuing its journey eastward. As a result of this southerly aspect, in this relatively broad valley, the shading effect of the mountains is less pronounced and the period of time in which the lakes are icebound is shorter than for most other mountain lakes. This is particularly important for migrating waterfowl.

The somewhat subtle topography of the area stands in marked contrast to the more rugged features of the surrounding mountains. This provides for some of the most gloriously scenic vistas to be found anywhere. The intrinsic beauty of the Vermilion Lakes themselves is magnified by the mountainous backdrop and the reflections which bring the peaks to the valley floor.

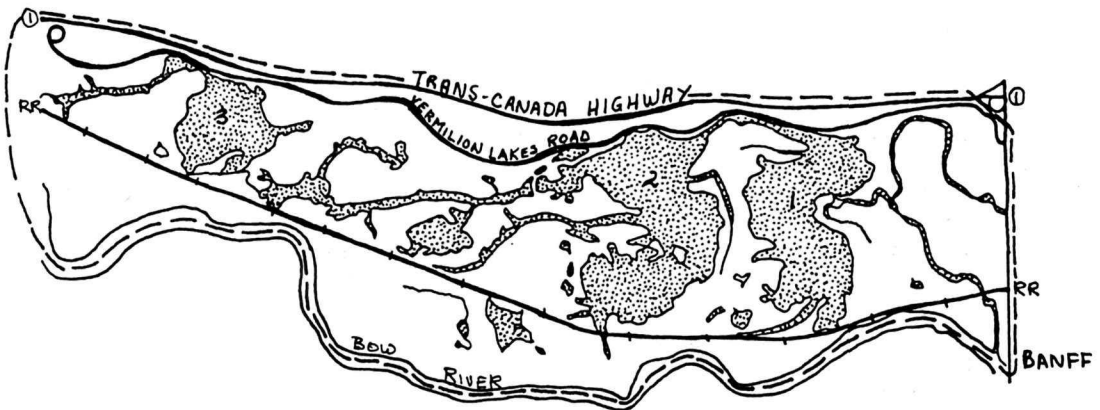


Figure 1. Vermilion Lakes study area.



Measuring tree girth during the study

Geoff Holroyd

The Study

Parks Canada, in recognizing the fact that perhaps nowhere else in the mountain National Parks is there a region so accessible and in which so many factors have combined to create such a rich and diverse natural history, has designated the Vermilion Lakes area as an interpretive unit. Beginning in the winter of 1976-77 and continuing throughout 1977 and into 1978, the Bow Valley Naturalists, in cooperation with Parks Canada have undertaken a study of the natural history values of a major portion of that unit. Although club members had held vague discussions about a project of this kind it was not until Banff's Chief Park Naturalist, Ross Dobson, approached the club in the autumn of 1976 and suggested a joint project, that this study was born.

The objectives of the study as stated by the Bow Valley Naturalists should be enunciated here with the hope that the completion of this written phase will be a major step in fulfilling those objectives.

- Objectives - to research (mainly through site visits) and document the natural history values of the Vermilion Lakes area.
- to get club members involved in an active, learning field project
 - to contribute to the development of a Park Interpretive Unit Plan
 - to provide information to park managers for improved park use
 - to increase residents' knowledge, interest and appreciation of the Vermilion Lakes
 - to provide the background for a club publication about the lakes
 - to help protect the Vermilion Lakes through wiser use or non-use
 - to cooperate with Parks Canada in a joint project

The Vermilion Lakes Interpretive Unit has the following boundaries: Trans-Canada Highway to Five Mile Bridge, Bow River to Banff, and the Mount Norquay Road. For the purposes of the study much of the area beyond Third Lake was removed. The boundaries of the study area are: the Trans-Canada Highway to Edith Creek, to the Bow River, to Banff, and the Mount Norquay Road. (see Figure 1)

Participating club members chose study teams based on their subject or subjects of interest. These teams then began a program of field research and library research - the object being to supplement the results of one field season, or one field year, with a pulling together of as much other information as was available on the area. As a result, many of the team reports contain significant amounts of both original and researched material. Of particular help, with regard to research material, were the Archives of the Canadian Rockies and the Banff National Park Library.

The shortcomings of this study will be fairly obvious to the reader. Some subjects have not been thoroughly surveyed and others, such as insects, have not been treated at all. In many cases, further study will require the application of more rigorous scientific methods including the collection of specimens. However, it is the nature of studies such as this to be introductory, and it is in that sense that we present it. It is not an end but a beginning, for there will always be more to learn about the Vermilion Lakes.

RECOMMENDATIONS

The Vermilion Lakes area is unique and a valuable National Park resource. It is very rich biologically, containing features uncommon in the Rockies; its accessibility provides an opportunity for park residents and visitors to observe an ecosystem in action. The data gathered through the course of this study support these statements.

The birds and mammals of the area are its most obvious and, for most people, interesting aspects. The number of species of birds observed at the lakes exceeds that for any other area of the mountain parks; the list contains several species for which the sightings in Banff National Park are unique. Many birds indigenous to the lakes have restricted ranges in the mountains: species such as the red-necked grebe, osprey, bald eagle, American bittern, sora and Canada goose. The lakes also provide low elevation, flat water critical to migrating waterfowl. The rich valley bottom lands are vital areas for moose, whose numbers appear to be declining elsewhere in the Bow Valley, mule deer and elk. Beaver, muskrat and mink, other species restricted in range in the park, are lake residents.

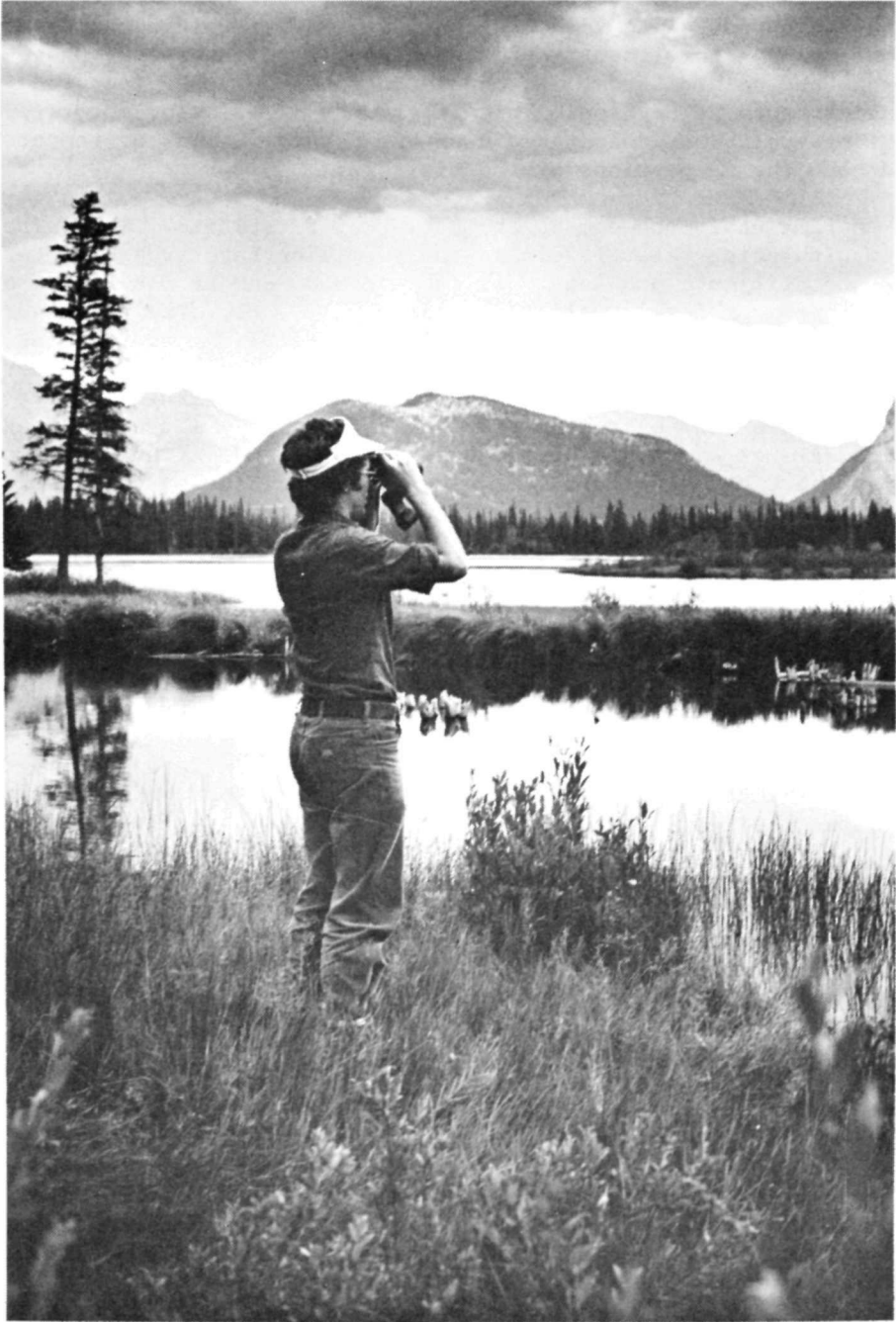
The vegetation of the area is the key to its richness and diversity, the most valuable being the extensive wetlands. Large areas of grass, sedge and willow communities are rare in the mountains. The shallowness of the lakes, their gently sloping shorelines, and the many marshes and deltas create ideal conditions for several uncommon species. Of special interest are water crowfoot, bladderwort, arrowhead and water smartweed. The bul-rushes, which provide nesting areas for red-winged blackbirds and red-necked grebes, have a restricted range as well. Several species of orchids found in the area are of interest especially since some, such as the round-leaved orchid, occur in quite large numbers.

The greatest social value of the Vermilion Lakes area is the opportunity it creates to observe the diversity which makes it rich, a recreation compatible with the values of National Parks.

It is our recommendation that Parks Canada:

1. zone the Vermilion Lakes as a special ecological area, recognizing and preserving their unique values;
2. allow no changes in the present rail and highway systems which would further encroach upon the lakes. Not wishing to debate the larger issue of expanding present transportation systems in the National Parks (to which we feel there are alternatives) we must stress the importance of this region being kept free from further impairment. The Vermilion Lakes Road should not be extended or upgraded. It serves its purpose well in its present form and the opportunities for slow speed travel and frequent stopping would be lost if it became a thoroughfare;

3. encourage at the Vermilion Lakes types of recreation compatible with the purposes and values of National Parks: walking, cycling, snowshoeing, cross-country skiing, canoeing, sightseeing, photography and nature study. No consideration should be given to changes, such as developing picnic grounds or allowing motorized boating, which would infringe upon the natural values of the area and upon the perceptions of the visitors;
4. not maintain the dam at the outlet of First Lake. The issue of manipulating water levels at the Vermilion Lakes raises interesting and difficult problems. If the man-made dam be made inoperative the water levels will change naturally, according to beaver activity and the rate at which sediment in-filling, eutrophication and succession occur. Lower water levels mean fewer fish, fewer diving ducks, more shorebirds, poorer canoeing. Maintaining water levels means that eutrophication and succession will be retarded; the processes of nature stayed by the hand of man. The authors of this report had difficulty arriving at a consensus on this matter, but we feel that if the dam is inoperative, drastic changes will not occur and the life of the lakes may proceed at its own pace;
5. continue the current trend (downward) in fish-stocking allowing the natural species balance to re-establish itself;
6. find a solution to the massive slaughter of mountain sheep on the Trans-Canada Highway in the Vermilion range;
7. study and monitor human visitation and use to determine whether it is detrimental to the natural values. Even appropriate activities may take their toll. There is already evidence of trampling around some shore areas, and there may be conflicts as a result of boating during the critical nesting and migration periods. While human enjoyment of the area is important, first consideration must be given to the protection of wild-life and habitat;
8. develop and implement an interpretive plan which would build its stories around the Vermilion Lakes as a special and unique feature of the mountain park environment;
9. develop and fund additional studies by trained personnel and specialists. We recommend studies of wetland vegetation: the grasses, sedges and willows. The Bow Valley Naturalists made no attempt to gather data on non-vascular plants or invertebrates, nor did we sample the hydrological and geological occurrences. Parks Canada should continue to collect valuable and interesting information about the Vermilion Lakes.



Margery McDougall

HUMAN HISTORY AND RECREATIONAL USE

Settlement of the Banff Area

Prior to the building of the railroad and the settling of the lower Bow Valley, only scattered records are available concerning white men in the area. Indians had visited the valley for centuries. Sir George Simpson passed through the valley in 1841 on a trip around the world. Dr. James Hector, a member of the Palliser Expedition, visited in 1858 and named many of the features such as Cascade Mountain and Mount Rundle. Prospectors Joe Healy and Willard Young worked in the area in the 1870's. In 1881 Canadian Pacific Railway surveyors visited the valley and in 1883 Siding 29 was established at the foot of Cascade Mountain (site of the present Banff Airport). This "town" boasted of several businesses and a hotel. With the railroad came numerous drifters, prospectors and traders. Industry was quick to follow. Coal mining began at Anthracite in 1883 and lumbering in the Spray Valley in 1884.

Hot springs were discovered in the valley as early as 1881 and this led in 1885 to the establishment of a ten square mile Banff Hot Springs Reserve. Renamed Rocky Mountains Park in 1887, the reserve was expanded to 260 square miles. In 1886, a townsite was surveyed and the town of Banff was officially born. Banff rapidly became a thriving tourist resort, capitalizing on the hot springs and the majestic scenery.



Banff Avenue ca. 1887

Early Reports

Early documented impressions of the Vermilion Lakes area can be found in old journals, books and reports. The following are three such impressions:

1858 The journals, detailed reports and observations relative to the explorations by Captain Palliser... by James Palliser.

"Above the rocky contraction of the channel the river is filled up with large swampy lakes, just like those in the cañon through the first range."

James Hector

1886 Annual Report of the Department of the Interior... by Mr. Whitcher

"Extending westwards from inside the junction of Forty Mile Creek with Bow River, for about four miles on the north side of the railway track, and along the base of the foot-hills is a succession of small lakes and ponds, with connecting channels, that anciently formed part of the Bow River basin. The meadows in which these ancient lakes and "leads" occur, are filled with coarse and tall grasses, peaty tufts, bunches of marsh willows, with insulated clumps of swamp alders and dwarf evergreens and fringes of reeds and rushes. These low covers are peculiarly fitted for the nesting and rearing of waterfowl, as the young broods could always find safe shelter amongst the weeds and thick grass from their worst enemies, the kit foxes and prairie wolves. Here and there a woody spit partially divides the pools and water-courses from each other, and separates both from the river's edge. The subsoil consists of black muck, inlaid with patches of sulphurous sediment, from which bubble springs of different temperatures."

1887 A Trip Round the World in 1887-88 ... by W.S. Caine

"...however, I managed to canoe my daughter up two or three miles of a swift running brook, and across a very beautiful lake from which it flowed, called the Vermilion Lake. Probably no man had ever seen that lake till two or three years ago, and it was a most perfect bit of wild and untouched nature. The day before, we had vainly tried to reach this lake by land, but the forest was so dense with fallen trees piled one over the other that it was quite impassable. I cannot find words to describe the

unique charms of the primitive and unspoiled scenery. The lake was as smooth as glass, its banks were a wild tangle of brushwood, poplar and maple, a perfect blaze of autumn red and gold, out of which sprang tall and sombre cedars and pine trees. Behind these were the snow-clad mountains, the whole perfectly repeated upon the surface of the water".

The Railway

The construction of the railway through the lower Bow Valley constitutes the first and perhaps the greatest of man's impacts on the Vermilion Lakes area. The rails opened the area to human settlement, thus beginning man's exploitation of the valley. As no detailed descriptions of the area were recorded prior to the building of the railway, it is difficult to accurately assess the physical impact; however, the barrier that the rail presents has had and continues to have a definite effect on the movement of water and the movement of both plants and animals within the lake system.

The railway also provided the first road in the area. A tote road was built ahead of the line for transportation of construction materials. Later in 1894, this abandoned road which lay along the north side of the lakes, was cleared of fallen timber and joined to the end of Lynx Street at the railway station. From that day vehicle access to the Vermilion Lakes was available.

Early Management

Plans for modification of the Vermilion Lakes area date back to the beginning of man's settlement in the area. Mr. Witcher's report to the Minister of the Interior for 1886 outlined a proposal to raise the water level at the lakes.

"A short dam about four feet high with perforated grating along the crest should be built across the narrow creek which empties these waters into Forty Mile Creek..."

This measure was proposed to provide a natural firebreak, to drown out predaceous animals (general policy at the time encouraged the elimination of predators), and to provide increased habitat for waterfowl and fish. There is no indication that this plan was ever carried out until a permanent dam was built across the outflow of First Lake in 1950.

However, a second facet of the plan to increase habitat for waterfowl was carried out in 1887 with the planting of "wild rice" in the lakes area. This "rice", actually a type of grass

was shipped from eastern Canada and was intended to provide food and shelter for waterfowl. There is no documentation of the results of this program or as to whether it was ever repeated.

In contrast to these early management plans, the following is an excerpt from a proposal sent to the Crag and Canyon, the local newspaper, in 1910 (May 14) by an interested citizen:

"This valley is at present an unsightly morass, only fit for breeding mosquitos and spreading of disease. Clean it up, and let Old Sol's rays into it. Have gravel paths for pedestrians, and paths for equestrians and vehicles, and here and there ponds through which the main drain would flow, the ponds bordered with wild flowers, which grow in abundance here; also as a matter of course, summer seats ad infinitum."

The railroad and other activities of man in the lower Bow Valley resulted in numerous fires in the area. For example, one such fire in 1904 burned the valley floor from the Vermilion Lakes to Baker Creek and up Johnston Canyon. Even earlier fires are evident from old photographs.

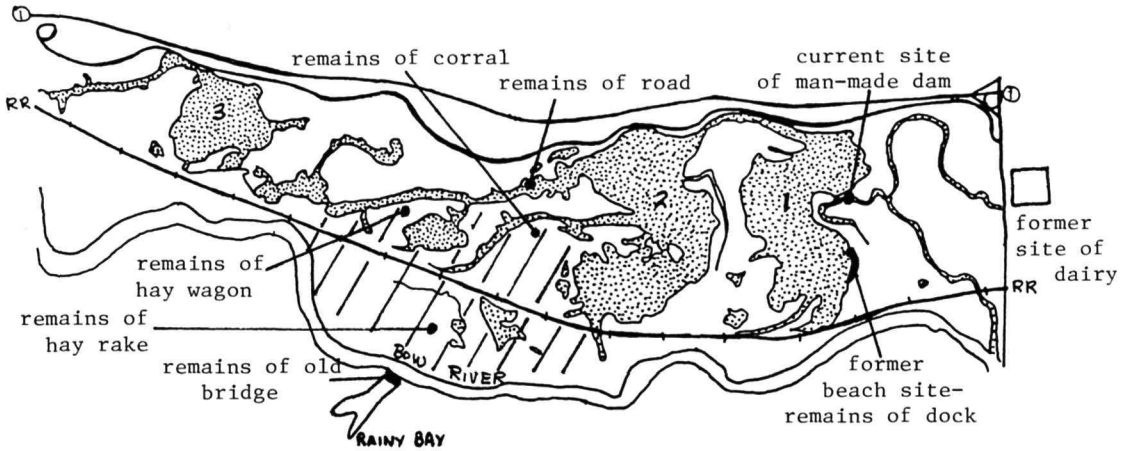


Figure 2. Human history map of the Vermilion Lakes area. (hatched area represents hay meadows)

Hay Harvesting

A crop of natural grasses known as the hay crop was harvested beginning in 1886 or 1887 in the area still referred to as the hay meadows in the Vermilion Lakes area. Tenders on the crops were taken each year with the highest bidder doing the cutting. The first crop brought in \$300. For many years these contracts went to Dr. R.G. Brett, one of Banff's most prominent citizens. The report to the Minister of the Interior in 1888 discussed the concern that repeated cutting would cause the crop to diminish and necessitate seeding. Although seed for this purpose was

ordered there is no indication that it was ever used, as the expected problem never arose.

"This hay crop appears to be thoroughly reliable no matter how the season affects the crop in other places. The natural irrigation on the Bow flats can always be depended on."

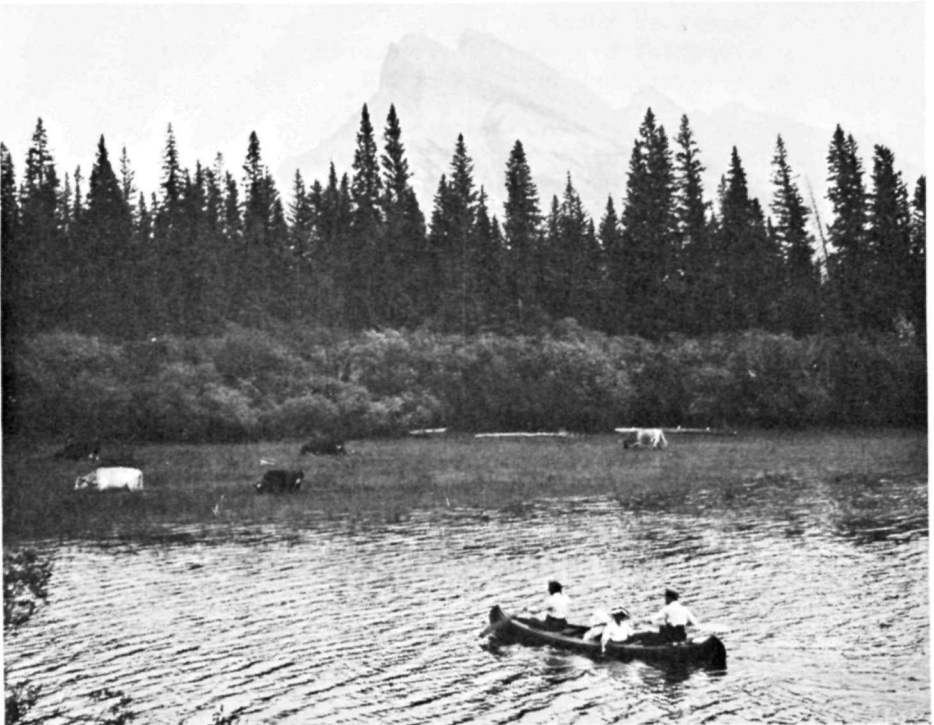
Interior Report 1894

No definite indication could be found of how long this hay harvesting continued. The last reference located was in the Crag and Canyon of August 13, 1910.

Evidence from the hay cutting era can be found today in the area of the lakes. There are remains of a plow, a hay wagon, numerous fence posts, a bridge and a road. (Figure 2).

Grazing

The grazing of both horses and cattle was permitted in the Vermilion Lakes area from the early days of settlement until perhaps as late as the 1930's. A dairy owned by the Brewster family (later by the Wellman and Moffat families) was built in 1896 on the present site of the curling rink. Cattle from the establishment were grazed at the Vermilion Lakes, as were horses belonging to packers in the area. Remains of an old corral can be seen west of Second Lake. In 1914 owners paid one dollar per head per season to graze their animals. In 1922 a total of



Cattle grazing at Vermilion Lakes, 1910

Vaux Collection

seventy-three grazing permits were issued in the park covering the grazing of 323 cows and 432 horses, many of these in the Vermilion Lakes area.

Mosquito Control

Very early after the settlement of the Banff area, a mosquito "problem" in the valley was acknowledged and it was suggested that coal oil be poured on the swamps west of the town. An intensive mosquito control program was in effect in the Vermilion Lakes area beginning in 1922 and continuing at least into the 1950's. Detailed information available from the early years of the program reveals that several methods were tried, including the use of dynamite to kill mosquito larva and the introduction of a mosquito-eating fish from Florida. Neither of these methods was successful. The water was generally too cold for the fish; however, a few still survive in the warm spring area of Third Lake and in the Cave and Basin area.

The most common method of control used was oiling. This began each season from the time the snow left until the flood season was over. One thousand barrels of kerosene were sprayed onto the wetlands west of Banff, using fruit sprayers, during this short season. Numerous trails were cut through the brush and swamps to increase access. Kerosene was later replaced by a special type of oil developed for the purpose and even later by a mixture of oil and DDT.

Fish Stocking

Sport fishing has been popular in the Vermilion Lakes since the very early days. The First and Third Lakes were stocked by the CPR in the late 1800's and until the Government Hatchery opened in 1913. Fish stocked successfully into the lakes under the government program from 1913 until the present are as follows:

FIRST LAKE	1913 to 1970	cutthroat trout	694,000
		eastern brook trout	494,000
		rainbow trout	4,000
	1971	eastern brook trout	14,000
	1972	eastern brook trout	6,000
		rainbow trout	2,000
	1973	rainbow trout	1,000
	1974	eastern brook trout	2,000
	1975	eastern brook trout	2,000
	1976	rainbow trout	1,000
	1977	no stocking occurred	

SECOND LAKE - this lake was not stocked prior to the building of a dam to raise the water level in 1950.

1950 to 1970	eastern brook trout	105,000
1971	eastern brook trout	9,000
1972	rainbow trout	2,000
	eastern brook trout	6,000
1973	rainbow trout	1,000
1974	rainbow trout	1,000
	eastern brook trout	1,000
1975	rainbow trout	1,750
	eastern brook trout	1,000
1976	rainbow trout	2,600
1977	no stocking occurred	

THIRD LAKE	1926 to 1953	cutthroat trout	95,000
		eastern brook trout	40,000
		rainbow trout	5,000
	1955	In this year the Third Lake was poisoned with Rotenone in order to eliminate "coarse" fish.	
	1957 to 1970	eastern brook trout	95,000
		rainbow trout	90,000
	1971	rainbow trout	10,000
	1972	eastern brook trout	3,000
		rainbow trout	3,500
	1973	rainbow trout	2,500
	1974	rainbow trout	2,500
	1975	rainbow trout	2,500
	1976	rainbow trout	2,500
	1977	rainbow trout	4,500

Introduction of splake trout (hybrid of lake and brook trouts) into First and Third Lakes in 1968 proved unsuccessful. In 1972 it was decided to scale down the stocking programs for all three lakes until a study could be carried out and evaluated. Lower volumes stocked during the last few years are apparently a result of difficulty in obtaining fish.

Severe winter kill affected all the lakes in 1959 and 1964. This prompted the Canadian Wildlife Service to begin an aeration experiment at Second Lake. This was considered a success but was discontinued in 1968 for economic reasons.

In 1962 a spawning bed was created in the inflow channel to Third Lake. A creek, locally known as Boyce Creek, was diverted into this channel to supply fresh water to the spawning beds. This stream, being very silty, has since contributed to the accelerated silting of Third Lake. A second bed was created for brook trout in 1965 in the channel between First and Second Lakes.

For a species list of fish found in Vermilion Lakes see page 65

Recreation

From the beginning of settlement of the Banff area, the Vermilion Lakes have been a popular recreation area for town residents and park visitors alike. Boating on both the river and the lakes was one of the earliest recreational activities. As early as 1888 Raymond Rooper operated a steam launch on the river. The following excerpt from The Rockies of Canada by Walter Wilcox (1909) discusses canoeing on the Vermilion Lakes.

"One of the most interesting excursions in the vicinity of Banff is a boating trip up the Bow River and through the Vermilion lakes (sic.). This part of the Bow Valley above the falls is flat and the river is here wide and deep, with a comparatively moderate current. A small stream half a mile from the boat-house leads to the Vermilion lakes (sic.), and on pleasant summer days is alive with canoes and boating parties."

The annual regatta, held every Victoria Day on the river, was relocated to the Vermilion Lakes during years of high water.

A sandy beach with a floating dock on First Lake provided a popular swimming spot until the water level of the lakes was raised in 1950.

Skating, curling and hockey were popular activities on the river where rinks were situated. Skating parties, complete with bonfires, were common at the Vermilion Lakes until the 1960's. Many of the events of the Banff Winter Carnival, during the 1920's and 1930's, such as snowshoeing and ski-joring, were held on the river adjacent to the lakes area.

The popularity of sport fishing led to the stocking program which continues at the lakes today. One very destructive method of catching fish employed in the early days involved igniting charges of dynamite in the water alongside the railway tracks and scooping the stunned fish up with nets.

The Vermilion Lakes have always been a popular area for sightseers. A bridle path to Edith Pass was completed in 1894. It began at the railway station and followed the old railway tote road along the north side of the lakes. The area was listed in tourist brochures as one of the sights to see around Banff. With the advent of motor vehicles a motor road was completed west to Castle Mountain in 1915, following the route of the bridle path in the vicinity of the lakes. This is also the route of the current Vermilion Lakes Road.

"...giving the motorist a splendid scenic drive from Banff, along the valley of the Bow River, skirting the charming Vermilion Lakes, with the pinnacle of Mount Edith in the near distance towering some 9,200 feet above sea-level."

Interior Report 1916

The construction of the Trans-Canada Highway in the early 1960's adjacent to the Vermilion Lakes served to increase the exposure of the area to the general public.



Canoeing at Vermilion Lakes, ca.1889

Boorne and May



Vermilion Lakes Road, 1926

Byron Harmon

Current Recreational Use of the Vermilion Lakes

The Vermilion Lakes have been both revered and abused in the past. Man has used dams, poisons, even dynamite in an attempt to modify the area. Even though some of the former aspects of human manipulation such as hay harvesting, domestic grazing, and mosquito control have disappeared; human impact on the area is greater than it has ever been. Regardless of past abuses, this wetland area remains one of the most valuable recreational areas in Banff National Park; allowing a type of recreation consistent with the values of National Parks.

The Vermilion Lakes area currently receives moderately high recreational use. During a nice summer day more than five hundred people can be found to be involved in one or more of a number of activities in the area. During September through June, the area is most popular with the local resident population with high use on the weekends by other Albertans, in particular Calgarians. During the busy summer months local use of the area drops in response to the heavy tourist influx, while the number of out-of-province visitors increases by three to four times. Although visitors are from all age groups, there is particularly high use from the young adult groups.

DRIVING AND SIGHTSEEING

This is the most predominant year-round activity in the area as a whole. The proximity of the Vermilion Lakes Road to the Trans-Canada Highway and the townsite accounts for the large numbers of people visiting the area in this way. The physical condition of the lakes road tends to force these users to proceed slowly thus enabling them to better enjoy the area; many stopping at various points along the road to view the scenery and natural features.

PICNICING

This activity is almost totally specific to the Fenland area where picnic facilities are supplied. Use of these is fairly intensive during the summer months and the resulting garbage leads to problems with bears being attracted to the area.

BOATING, CANOEING AND FISHING

Boating, canoeing and fishing are, as in the past, very popular activities for both residents and park visitors. Boating and fishing activities are often interrelated. Canoeing up the creeks from the river, where canoes can be rented, is still a very popular outing.

These activities are generally more compatible with park values than some others; however, some problems can be recognized. Boating in marshy and lake-edge areas disturbs nesting waterfowl and the portaging of boats over and around unnavigable sections damages vegetation and other features, such as beaver dams. Similar disturbances result from fishermen moving along shore areas and dams in an attempt to reach good fishing spots.

CYCLING, HIKING AND JOGGING

The Fenland Trail and the Vermilion Lakes Road are popular choices for people pursuing these activities in the vicinity of the townsite. Many residents use them daily. The rural character of the road is largely responsible for its popularity; character which would likely be lost if the road were to be upgraded or extended.

SKATING AND SKIING

Skating and cross-country skiing are two popular winter activities in the Vermilion Lakes area. Although skating does not enjoy the popularity it once did on the lakes, on a Sunday afternoon during early winter when freeze-up has preceded the snow, First Lake will be covered with skaters of all ages. The flatness of the Vermilion Lakes area makes it an ideal area for the novice cross-country skier, and provides good runs for those interested in racing. Ski-touring allows the nature enthusiast to visit parts of the area which are unavailable during the summer due to wet conditions.

NATURE OBSERVATION AND PHOTOGRAPHY

The growing popularity of these two pastimes, in the Vermilion Lakes area as elsewhere, is worthy of consideration. More people are becoming aware, through interpretation and education programs, of the natural features which the park has to offer. The Vermilion Lakes area is important in its potential for intimate contact between the park visitor and the wetland environment.

"Beaver-watching" is an example of a popular nature-oriented activity involving people in the Vermilion Lakes area. These animals are easy to observe, even from the road. Bird watching is also very popular, this being one of the main areas in the mountains to view waterfowl.



Keith McDougall



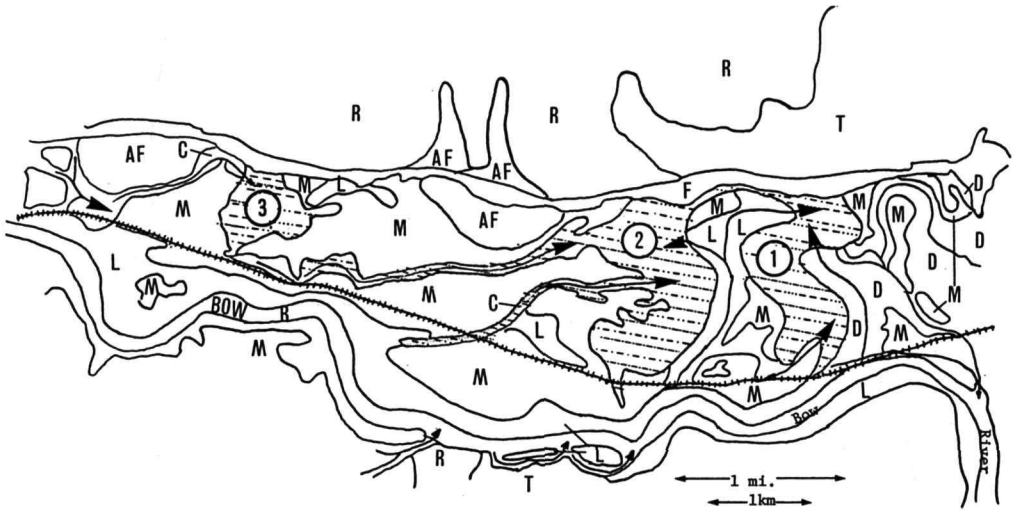
View from Mount Norquay

Keith McDougall

GEOMORPHOLOGY

The features present in the Vermilion Lakes area are typical of a low gradient region of a river's course: characterized by alluvial and organic deposits with minor erosional features. The area is quite subtle in its relief features and is evidenced by a broad flat backswamp area with the major topographical features being a natural levee and point bar deposits. This is in marked contrast to the surrounding mountain areas; also in marked contrast are the constituent materials of the two areas: for the lakes, friable, non-compacted and easily eroded river deposits (alluvium), gravity-borne mountain debris (colluvium), glacial till, and organic "peat" deposits of Recent Age (less than 10,000 years); for the mountains, consolidated marine deposits (limestone, dolomite shale, breccia, and sandstone) ranging from Devonian to Pennsylvanian in age (three hundred & ten million years to four hundred & five million years).

The geology of the mountains seems to have had little direct effect on the present formations - apart from the obvious locating of the lakes by the channeling course of the Bow River, and its activities, and the advance of glaciers. The lakes are less the result of cataclysmic orogenic (mountain-building) forces than the more mundane processes of deposition and erosion. We are thus looking more at geomorphology than geology.



SYMBOLS

- ++++ CPR tracks
- Boundary, defined
- ← Thalweg of flood distributary channel or small stream. Arrow shows flow direction.

- M - Marsh
- C - Flood distributary channel
- L - Natural levee and point bar deposits
- D - Delta of Forty Mile Creek
- AF- Alluvial fan
- T - Glacial till covered slope
- F - Man-made fill
- R - Exposed bedrock slope

Figure 3. General land forms of the Vermilion Lakes area.

Physical Features

The Vermilion Lakes consist of three major and numerous minor flood plain lakes along the course of the Bow River. A number of land forms associated with the lakes can be identified. These features are mapped in Figure 3. An understanding of these features is essential to the understanding of the natural history of the Vermilion Lakes. The symbols in parentheses refer to the legend in Figure 3.

NATURAL LEVEE (L)

Natural levee and point bar deposits are mapped together and have similar origins. Natural levees are long low ridges of sand and silt found on both sides of the channel of a river. Natural levees form when large flood flows cause the river to widen beyond its usual course and occupy most of its flood plain. As the stream widens and becomes shallower, its velocity and its ability to transport sediment decreases. Consequently, much of the sand size material carried by the river is rapidly deposited. This deposition causes the build up of low flat ridges or natural levees parallel to the usual course of the stream.

POINT BARS (L)

Point bars are concentric ridges of sand and silt which are deposited on the inside of river bends. Deposition of the sand occurs because flow velocities are slower on the inside of bends than on the outside. Thus sand which is carried by the river from farther upstream tends to be deposited on the inside of bends. Because natural levees and point bars are slightly higher (1 to 2 m in the case of the Bow River) than the surrounding flood plain, they are better drained. Consequently spruce trees grow on them and are absent elsewhere in the wetter parts of the flood plain. This feature allows the natural levees and point bars to be easily recognized in air photographs or on field trips.

BACK SWAMPS (M)

Marshes or back swamps, as they are called when they are part of a flood plain, are low lying areas where the water table is at or very close to the surface. They are usually covered by water loving vegetation. Back swamp area may be under water during significant portions of the year.

FLOOD DISTRIBUTARY CHANNELS (C)

Flood distributary channels form when large flood flows of a river cause a levee to be breached allowing flood waters to spill into the adjacent back swamp. The channels are scoured where the flow velocities are greatest. The same flood distributary channels may be used over and over by the river during floods and become almost permanent features. They also develop their own natural levees as can be seen in Figure 3.

ALLUVIAL FANS (AF)

Alluvial fans are fan shaped deposits of sand and gravel found at locations where steep tributary streams enter the valley of streams with gentler gradients. The sudden decrease in gradient causes the velocity of the tributary stream to decrease with a commensurate decrease in its ability to transport sediment. This causes the stream to drop much of its sediment load in its channel, blocking the channel and causing the stream to shift laterally and cut another channel. Over the years, fan shaped deposits of sand and gravel are built out into the valley by the tributary stream.

DELTA (D)

A delta is a wedge shaped deposit of sand, gravel, silt and clay built into a body of water by a stream. The process of deposition is similar to that occurring on an alluvial fan. Because the stream enters still water, the velocity approaches zero and its sediment load is deposited causing the stream to periodically block its channel and to seek a new one. Consequently, over a period of years it migrates back and forth across the delta. Forty Mile Creek has built a delta into First Lake. The protuberances of marshy land and natural levees surrounding a number of the flood distributing channels which terminate in the Vermilion Lakes are also deltas during floods of the Bow River.

GLACIAL TILL (T)

Slopes adjacent to the Vermilion Lakes are either steep exposures of limestone, dolomite shale bedrock (R) or are covered by glacial till, an unsorted mixture of clay to boulder size particles deposited by the last glacier to occupy the area.

History

Lakes, like people, have a birth, youth, maturity, and eventual death. By understanding the geologic and hydrologic processes at work in and around the lakes today, it is possible to conceptually reconstruct the history of the lakes and speculate upon their ultimate demise.

The origin of the Vermilion Lakes began about 10,000 years ago when the glacier which occupied the Bow Valley during the last ice age retreated up valley from the Vermilion Lakes leaving deposits of glacial till which now can be seen along the valley walls. The Bow Valley was flooded by a wide braided flood plain. Outwash from the glacier flowed both north and south of Tunnel Mountain. Finally, however, deepening of the valley occupied by Bow Falls captured all of the flow leaving the course north of Tunnel Mountain dry.

As the glaciers disappeared from the area, and the sediment load of the Bow River decreased and became finer in texture,

the river began to favour a single meandering channel rather than a braided one. Natural levees began to develop along the channel between the levees and the mountain sides. Drainage to the Bow River was impeded. A back swamp began to develop. Also by this time alluvial fans had begun to be built out into the Bow Valley with Forty Mile Creek establishing its southward course into the area.

As time went by, floods of the Bow River periodically breached levees causing sediment changed waters to pour into the backswamp areas. Flood distributary channels began to become established with their own attendant natural levees and surrounding small delta. Also, Forty Mile Creek continued to expand its alluvial fan and build a delta into the back swamp area now occupied by the Vermilion Lakes. A few thousand years ago, the present lake basins were generally established as remaining low areas between enlarging flood distributary deltas and the delta of Forty Mile Creek. These processes continued and ultimately produced the low areas and levee ridges which define the Vermilion Lakes today.

Sedimentation in the Vermilion Lakes back swamp area by the Bow River is not entirely the whole story of the formation of the low areas they occupy. Living things also have a role. From the start, plants have lived and died, along and in wet portions of the area. The plants have provided organic sediment which has helped to fill in low lying areas. Beavers have played an opposite role. By building dams, they have in the past raised lake levels and created new ponds and lakes in the Vermilion Lakes area. Finally, man himself has raised and enlarged the lakes by the construction of a small dam at their outlet. He has changed drainage patterns in the area by the construction of the C.P.R. mainline which acts as a levee.

The immediate future of the Vermilion Lakes will see a continuation of infilling by vegetation and silt and sand during floods of the Bow River. The Vermilion Lakes will become flat moist meadows with forest slowly encroaching upon them. The ultimate future of the Vermilion Lakes holds two possibilities. Bow Falls is slowly working its way up the Bow River due to headward erosion by the rapidly flowing waters. Eventually, the Bow River channel next to the Vermilion Lakes will be a narrow steep-sided canyon. Tributary streams which cross the meadows which were once the lakes will cut small canyons in response. A badland-like topography may result. A second possibility is that the climate, as it has done many times in the past, will cool causing the glaciers to again advance. This will wipe the slate clean and make way for perhaps a new set of Vermilion Lakes sometime in the distant future.



Keith McDougall

VEGETATION

The vegetation of the Vermilion Lakes area is a diverse and complex component of its natural history. It is possible to recognize a number of distinct habitats or plant associations which overlap and blend in with one another in a reflection of the subtle topography. Their variety gives the major clue to the abundance and diversity of the wildlife found in this region. A brief description of some of the major, more readily recognizable habitats follows.

Plant communities

OPEN, ROCKY SLOPES occur in places above the Vermilion Lakes Road. They are characterized by steepness, a south facing aspect and the frequent occurrence of exposed bedrock. Tree growth is scattered. Shrubs such as *Shepherdia canadensis* (buffalo-berry) and *Rosa acicularis* (prickly rose) are occasional. They are early blooming areas and are home to grasses and mat forming species such as *Antennarias* (everlastings) and are dotted with the *Senecios* (rag-worts) which thrive in the rocky, exposed conditions.

Another habitat, limited in occurrence but distinct, is the DOUGLAS FIR SAVANNAH type, characteristic of the montane forest and includes the *Juniperus scopularum* (Rocky Mountain juniper) as one of its indicator species. This particular association is in fact quite rare in Banff National Park. It appears on the steep slopes above the First and Second Lakes.

The ASPEN COMMUNITY appears throughout the Vermilion Lakes area, achieving clear dominance primarily above the Second Lake and between Second and Third Lakes. Well represented towards the river, it tends to mingle with the willows of the lake shallows and the poplar forest of the riverbank. Typical shrubs are *Rosa acicularis* (prickly rose), *Shepherdia canadensis* (buffalo-berry), and *Juniperus communis* (ground juniper) while *Arctostaphylos uva-ursi* (bearberry) is a dominant ground cover.

The POPLAR COMMUNITY is considered as primarily a river edge successional species in the Bow Valley. Its location indicates a wetter environment. As a lakeshore species, along with aspen, it is vulnerable to beaver activity, such as is very much in evidence at Second Lake and near the outlet of First Lake.

LODGEPOLE PINE COMMUNITY is scattered throughout the Vermilion Lakes area, a clearly recognizable sample being situated above the road west of Third Lake. Its occurrence here may be traceable to one of the major fires which swept through large areas of the Bow Valley in the early part of the century. Shrub growth is occasional with *Calamagrostis rubescens* (pinegrass) being the major component of the understory. Typical herbs include *Lathyrus ochroleucus* (yellow pea vine). The *Calypso bulbosa* (calypso) is seen occasionally.

WHITE SPRUCE COMMUNITY is the climax forest species in this area and is found throughout in varying degrees of abundance and at varying levels of maturity. Where it has achieved dominance, it is found in association with such shrubs as *Cornus stolonifera* (red osier dogwood), some of the *Ribes* species (currants) and *Viburnum edule* (low bush cranberry). The herb layer commonly has *Equisetum* species (horsetails), some shade and moisture loving orchids and the *Pyrola* species (wintergreens). One of the best examples of mature spruce forest is to be found in the Fenland Trail area.

Slightly upland from the lakes themselves are scattered clumps of TALL WILLOWS which are quite distinct on the river side of the railway tracks beyond the Second and Third Lakes. Grasses form the dominant ground cover.

SMALL WILLOWS growing on hummocky ground in mud with sedges are another obvious community type, commonly found along the lake-shores. *Rubus pubescens* (dewberry) and *Spiranthes romanzoffiana* (ladies' tresses) are typical herbs.

Venturing deeper into the lakes one finds more EMERGENTS, and the ROOTED and SUBMERGED AQUATICS.

Various disturbances, primarily the construction and use of the Trans-Canada Highway, Vermilion Lakes Road and the railway, has resulted in a fairly large number of annuals which may be considered weedy or exotic. *Taraxacum officinale* (dandelion), *Thlaspi arvense* (stinkweed), and *Cirsium* species (thistles) are good examples of these.

ANNOTATED LIST OF VASCULAR PLANTS

Common and scientific names are based on The Flora of Alberta by E.H. Moss.

AB: abundant
FR: frequent
OCC: occasional

EQUISETOPHYTA

EQUISATACEAE Horsetail Family

Equisetum arvense AB - poorly drained
Common field horsetail areas
Equisetum spcs. AB - dark spruce
smaller species possibly forests
pratense & *scirpoides*

PINOPHYTA (Gymnosperms)

CUPRESSACEAE Juniper Family

Juniperus communis AB - dry open slopes,
Ground juniper aspen forests
Juniperus horizontalis AB - as above
Creeping juniper
Juniperus scopularum OCC - dry open slopes
Rocky Mountain juniper

PINACEAE Pine Family

Picea glauca AB - major community
White spruce
Pinus contorta AB - major stand north-
Lodgepole pine west of Third Lake
Pseudotsuga menziesii OCC - open stand of mature
Douglas fir trees on slopes

LILIATAE (Monocotyledons)

ALISMACEAE Water-plantain Family

Sagittaria cuneata OCC - in shallow waters
Arrowhead of lakes

CYPERACEAE Sedge Family

Carex spcs. AB - many species un-
Sedges identified
Eleocharis sp. AB - emergent
Spike rush
Scirpus sp. AB - emergent
Bulrush

GRAMINEAE Grass Family

Agropyron spicatum AB - on dry slopes
Blue-bunched wheatgrass
Agropyron trachycaulum AB - wooded areas
Slender wheat grass

GRAMINEAE (cont.)

<i>Bromus inermis</i> Awnless brome	AB - disturbed areas
<i>Calamagrostis canadensis</i> Marsh reed grass	AB - wet areas
<i>Calamagrostis rubescens</i> Pinegrass	AB - herb layer in pine and fir forests
<i>Elymus innovatus</i> Wild rye	FR - in Douglas Fir stands
<i>Hierochloa odorata</i> Sweetgrass	FR - wet grounds
<i>Hordeum</i> sp. Foxtail barley	AB - disturbed areas
<i>Phleum pratense</i> Timothy	FR - open areas
<i>Poa alpina</i> Alpine bluegrass	AB - wooded areas
<i>Poa compressa</i> Canada bluegrass	OCC - Douglas Fir stands
<i>Poa pratensis</i> Kentucky bluegrass	AB - open dry areas

* Many of the grasses were not identified.

IRIDACEAE Iris Family

<i>Sisyrinchium montanum</i> Blue-eyed grass	FR - clearings and open slopes
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JUNACEAE Rush Family

<i>Juncus balticus</i> Wire rush	AB - wet areas
<i>Juncus</i> spcs. Wire rush	AB - emergents

LEMNACEAE Duckweed Family

<i>Lemna minor</i> Common duckweed	AB - surface of shallow waters
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LILIACEAE Lily Family

<i>Allium cernuum</i> Nodding onion	FR - dry open slopes
<i>Lilium philadelphicum</i> Tiger lily	OCC - wooded areas
<i>Smilacina stellata</i> Star-flowered Solomon's seal	AB - various communities
<i>Zygadenus elegans</i> White camas or green lily	OCC - dry open areas

ORCHIDACEAE Orchid Family

<i>Calypso bulbosa</i> Calypso	ACC - pine and mature spruce forests
<i>Corrallorhiza trifida</i> Pale coral root	FR - dark wet spruce forests
<i>Cypripedium passerinum</i> Sparrow's egg lady slipper	OCC - wet grounds, hummocky areas
<i>Habenaria hyperborea</i> Northern green orchid	FR - dark wet spruce forests

ORCHIDACEAE (cont.)

Listera borealis
Northern twayblade

Rare - seen only twice
in shaded spruce
forest along Fenland
Trail

Orchis rotundifolia
Round-leaved orchid

AB - major species in
wet spruce forests

Spiranthes romanzoffiana
Ladies' tresses

OCC - wet spruce forests

POTAMOGETONACEAE Pondweed Family

Potamogeton natans
Pondweed

OCC - lake shallows,
rooted aquatics

Potamogeton filiformis
Pondweed

OCC - lake shallows,
rooted aquatics

Potamogeton richardsonii
Pondweed

OCC - lake shallows,
rooted aquatics

Potamogeton pusillus
Pondweed

OCC - lake shallows,
rooted aquatics

Potamogeton friesii
Pondweed

OCC - lake shallows,
rooted aquatics

SPARGANIACEAE Bur-reed Family

Sparganium angustifolium
Giant bur-reed

OCC - emergent

TYPHACEAE Cattail Family

Typha latifolia
Common cattail

OCC - emergent in 1st &
2nd lakes

MAGNOLIATAE (Dicotyledons)

APOCYNACEAE Dogbane Family

Apocynum androsaemifolium
Spreading dogbane

OCC - dry open areas

BETULACEAE Birch Family

Betula spcs.
Birch (possibly *glandulosa*,
occidentalis)

FR - poorly drained
areas

BORAGINACEAE Borage Family

Lappula redowskii
Blue-bur

OCC - weed on disturbed
sites

CAMPANULACEAE Bluebell Family

Campanula rotundifolia
Harebell

FR - clearings and light
wooded areas

CAPRIFOLIACEAE Honeysuckle Family

Linnaea borealis
Twinflower

FR - ground cover in
spruce forests

Lonicera dioica var. *glaucescens*
Twining honeysuckle

FR - aspen woods

Lonicera involucrata
Bracted honeysuckle

FR - aspen woods

Symphoricarpos albus
Snowberry

FR - aspen woods

Viburnum edule
Low bush cranberry

OCC - wet spruce forests

CARYOPHYLLACEAE Pink Family

<i>Arenaria</i> sp.	OCC - wooded areas
Sandwort	
<i>Cerastium arvense</i>	AB - various habitats
Field chickweed	
<i>Stellaria longipes</i>	OCC - wooded areas
Long-stalked chickweed	

COMPOSITAE Composite Family

<i>Achillea millefolium</i>	AB - mostly disturbed areas
Yarrow or milfoil	
<i>Agoseris glauca</i>	FR - open areas
False dandelion	
<i>Anaphalis margaritaceae</i>	OCC - aspen woods
Pearly everlasting	
<i>Antennaria nitida</i>	AB - major ground cover on open slopes
Pussytoes	
<i>Antennaria pulcherrima</i>	AB - open dry areas
Showy everlasting	
<i>Antennaria rosea</i>	AB - open dry areas
Pink pussytoes	
<i>Artemisia frigida</i>	OCC - dry slopes, disturbed areas
Pasture sage	
<i>Aster ciliolatus</i>	AB - roadsides, open areas, light woods
Lindley's aster	
<i>Aster conspicuus</i>	AB - roadsides, clearings
Showy aster	
<i>Aster junciformis</i>	OCC - wet grassy areas
Aster	
* Many asters were not identified.	
<i>Chrysanthemum leucanthemum</i>	FR - disturbed sites
Ox-eye daisy	
<i>Chrysopsis villosa</i>	OCC - roadsides, dry open areas
Golden aster	
<i>Cirsium arvense</i>	OCC - disturbed sites
Canada thistle	
<i>Cirsium hookerianum</i>	OCC - disturbed sites
Elk thistle	
<i>Cirsium vulgare</i>	OCC - disturbed sites
Bull thistle	
<i>Erigeron compositus</i>	AB - open and disturbed areas
Cut-leaved fleabane	
<i>Erigeron pumilus</i>	AB - dry open areas
Fleabane	
* Many species not identified.	
<i>Gaillardia aristata</i>	AB - dry slopes and open areas
Brown-eyed Susan	
<i>Matricaria matricarioides</i>	FR - disturbed areas
Pineapple weed	
<i>Petasites palmatus</i>	OCC - wet areas
Palmated coltsfoot	
<i>Petasites sagittatus</i>	AB - wet areas
Arrow-leaved coltsfoot	

COMPOSITAE (cont.)

- Senecio canus* & *intergerimus* OCC - dry open areas
Prairie groundsel
- Senecio canus* AB - dry and open areas
Prairie groundsel
- Senecio pseud aureus* OCC - moist areas
Groundsel, ragwort
- * Many species not identified.
- Solidago decumbens* AB - disturbed sites
Goldenrod
- Solidago multiradiata* AB - disturbed sites
Goldenrod
- Sonchus uliginosus* FR - disturbed sites
Perennial sow thistle
- Taraxacum officinale* AB - disturbed sites
Dandelion
- Tragopogon dubius* OCC - roadsides
Goat's beard or salsify
- CORNACEAE Dogwood Family
- Cornus canadensis* AB - major ground cover
Bunchberry
- Cornus stolonifera* FR - aspen woods and
Red-osier dogwood
- CRUCIFERAE Mustard Family
- Arabis holboellii* FR - dry open slopes
Rock cress
- * Other species not identified.
- Capsella bursa-pastoris* FR - disturbed sites
Shepherd's purse
- Descurainia sophia* FR - disturbed sites
Tansy mustard
- Erysimum cheiranthoides* OCC - open dry slopes
Wormseed mustard
- Rorippa nasturtium-aquaticum* OCC - near inlet of hot
Water cress
- Thlaspi arvense* FR - disturbed sites
Stinkweed
- * Other mustards not identified.
- ELEAGNACEAE Oleaster Family
- Elaeagnus commutata* OCC - above 1st lake,
Wolfwillow or silverberry
- Shepherdia canadensis* AB - major shrub in dry
Buffalo-berry
- ERICACEAE Heath Family
- Arctostaphylos uva-ursi* AB - major ground cover
Bearberry or kinnikinnick
- Ledum groenlandicum* OCC - wet spruce forests
Labrador tea

<u>FUMARIACEAE</u> Fumitory Family	
<i>Corydalis aurea</i>	OCC - disturbed sites
Golden corydalis	
<u>GENTIANACEAE</u> Gentian Family	
<i>Gentiana affinis</i>	AB - various dry habitats
Prairie gentian	
<u>HALORAGIDACEAE</u> Water-milfoil Family	
<i>Myriophyllum</i> sp.	FR - rooted aquatic
Water milfoil	
<u>HIPPURIDACEAE</u> Mare's tail Family	
<i>Hippuris vulgaris</i>	FR - emergent, in
Mare's tail	shallow waters
<u>LABIATAE</u> Mint Family	
<i>Galeopsis tetrahit</i>	OCC - wet grounds,
Hemp nettle	streambanks
<i>Mentha arvensis</i>	OCC - wet grounds
Wild mint	
<u>LEGUMINOSAE</u> Pea Family	
<i>Astragalus aboriginum</i>	FR - open areas and
Indian milk vetch	aspen woods
<i>Astragalus alpinus</i>	OCC - open areas and
Alpine milk vetch	aspen woods
<i>Astragalus miser</i> or <i>decumbens</i>	AB - open areas and
Timber milk vetch	aspen woods
<i>Astragalus frigidus</i> var. <i>americanus</i>	OCC - thick aspen woods
Milk vetch	
<i>Hedysarum alpinum</i>	FR - aspen woods
Alpine hedysarum	
<i>Hedysarum sulphurescens</i>	AB - aspen woods, open
Yellow hedysarum	areas
<i>Lathyrus ochroleucus</i>	AB - aspen woods, open
Yellow pea vine	areas
<i>Medicago lupulina</i>	AB - disturbed areas
Black medick	
<i>Melilotus alba</i>	AB - disturbed areas
White sweet clover	
<i>Melilotus officinalis</i>	AB - disturbed areas
Yellow sweet clover	
<i>Oxytropis campestris</i>	AB - dry open areas
Late loco weed	and aspen woods
<i>Oxytropis sericea</i>	AB - dry open areas
Early loco weed	and aspen woods
<i>Oxytropis splendens</i>	OCC - dry open areas
Showy loco weed	
<i>Oxytropis viscida</i>	FR - dry open areas
Viscid loco weed	and aspen woods
<i>Trifolium repens</i>	FR - disturbed sites
White clover	
<i>Vicia americana</i>	OCC - disturbed sites
American wild vetch	and open areas
<i>Vicia cracca</i>	OCC - disturbed sites
Wild vetch	and open areas

<u>LENTIBULARIACEAE</u>	Bladderwort Family	
	<i>Utricularia vulgaris</i>	OCC - rooted aquatic
	Common bladderwort	
<u>LINACEAE</u>	Flax Family	
	<i>Linum lewisii</i>	FR - dry open areas
	Wild blue flax	
<u>LORANTHACEAE</u>	Mistletoe Family	
	<i>Arceuthobium americanum</i>	OCC - parasitic on
	Dwarf mistletoe	lodgepole pine
<u>ONAGRACEAE</u>	Evening Primrose Family	
	<i>Epilobium angustifolium</i>	OCC - disturbed areas
	Fireweed	
	<i>Epilobium</i> sp.	OCC - streambanks
	smaller species not identified	
<u>PLANTAGINACEAE</u>	Plantain Family	
	<i>Plantago major</i>	FR - disturbed areas
	Common plantain	
<u>POLYGONACEAE</u>	Buckwheat Family	
	<i>Polygonum amphibium</i>	OCC - rooted aquatics
	Water smartweed or knotweed	
	<i>Polygonum bistortoides</i>	OCC - wet areas
	American bistort	
	<i>Rumex occidentalis</i>	OCC - grass-sedge area
	Western dock	beside 3rd lake
<u>PRIMULACEAE</u>	Primrose Family	
	<i>Androsace septentrionalis</i>	AB - dry open slopes
	Fairy candelabra	
	<i>Dodecatheon radicum</i>	OCC - open areas near
	Shooting star	aspen forests
<u>PYROLACEAE</u>	Wintergreen Family	
	<i>Moneses uniflora</i>	OCC - dark spruce
	One-flowered wintergreen	forests
	<i>Pyrola asarifolia</i>	OCC - dark spruce
	Common pink wintergreen	forests
	<i>Pyrola secunda</i>	OCC - dark spruce
	One-sided wintergreen	forests
	<i>Pyrola virens</i>	OCC - dark spruce
	Green wintergreen	forests
<u>RANUNCULACEAE</u>	Crowfoot Family	
	<i>Actaea rubra</i>	OCC - thick aspen woods
	Baneberry	
	<i>Anemone drummondii</i>	OCC - dry open areas
	Drummond's anemone	
	<i>Anemone multifida</i>	AB - dry open areas
	Cut-leaved anemone	and aspen forests
	<i>Anemone parviflora</i>	OCC - wet areas,
	Few-flowered anemone	spruce forests
	<i>Anemone patens</i> var. <i>wolfgangiana</i>	OCC - dry open slopes
	Crocus	
	<i>Aquilegia brevistyla</i>	Rare - one seen on Fenland
	Blue columbine	Trail in grassy clearing

RANUNCULACEAE (cont.)

- Aquilegia flavescens* OCC - open aspen forests
Yellow columbine
Clematis verticellaris var. FR - aspen woods, spruce
columbiana forests
Clematis
Ranunculus acris FR - disturbed areas
Tall buttercup
Ranunculus cardiophyllus OCC - open areas
Heart-leaved buttercup
Ranunculus flammula OCC - muddy shores
Creeping spearwort
Ranunculus sp. FR - rooted aquatic
Water crowfoot
Thalictrum venulosum FR - aspen woods
Veiny meadow rue

ROSACEAE Rose Family

- Amelanchier alnifolia* OCC - clearings near
Saskatoon or serviceberry aspen woods
Dryas drummondii OCC - gravelly areas
Yellow dryad
Fragaria virginiana AB - various habitats
Wild strawberry
Potentilla concinna FR - disturbed sites
Early cinquefoil
Potentilla fruticosa OCC - open areas
Shrubby cinquefoil
Potentilla norvegica FR - disturbed areas
Rough cinquefoil
Prunus virginiana OCC - clearings near
Chokecherry aspen forests
Rosa acicularis AB - major shrubs in
Prickly rose aspen forests, dry
open areas
Rubus acaulis OCC - wet spruce
Dwarf raspberry forests
Rubus pubescens OCC - wet spruce
Dewberry forests
Rubus strigosus OCC - disturbed areas
Wild red raspberry
Spirea sp. OCC - aspen woods
Wild spirea or meadowsweet

RUBIACEAE Madder Family

- Gallium boreale* FR - aspen woods,
Northern bedstraw open areas

SALICACEAE Willow Family

- Populus balsamifera* FR - river bank
Balsam poplar
Populus tremuloides FR - drier areas,
Trembling aspen slopes
Salix spcs. AB - major communities
*None were identified. in wetlands

SANTALACEAE Sandalwood Family

Commandra pallida

Pale commandra

Geocaulon lividum

Bastard toad flax

SAXIFRAGACEAE Saxifrage Family

Mitella nuda

Mitrewort, Bishop's cap

Parnassia palustris

Grass-of-Parnassus

Ribes hudsonianum

Wild black currant

Ribes lacustre

Bristly black currant

Ribes oxyacanthoides

Wild gooseberry

SCROPHULARIACEAE Figwort Family

Castilleja miniata

Common Indian paintbrush

Collinsia parviflora

Blue-eyed Mary

Linaria vulgaris

Butter and eggs

Pedicularis bracteosa

Western lousewort

Pedicularis groenlandica

Elephant's head

Penstemon confertus

Yellow beard tongue

Rhinanthus crista-galli

Yellow rattle

UMBELLIFERAE Carrot Family

Heracleum lanatum

Cow parsnip

Lomatium sp.

Parsley, flower yellow

Zizia aptera

Heart-leaved Alexander

VIOLACEAE Violet Family

Viola adunca

Early blue violet

Viola renifolia

Kidney-leaved violet

Viola rugulosa

Western Canada violet

FR - open areas,
aspen forests

AB - disturbed areas

OCC - dark spruce
forests

OCC - dark spruce
forests

Rare - seen in dark
spruce forest
west of 3rd lake

FR - open areas,
aspen forests

FR - open areas,
aspen forests

OCC - open areas,
aspen forests

OCC - dry open slopes

OCC - disturbed areas

OCC - aspen woods

FR - wet areas,
spruce areas

AB - dry open areas

OCC - open areas

FR - streambanks, edge
of beaver pond

OCC - dry open slopes

FR - open areas,
aspen forests

FR - open and wooded
areas

OCC - dark spruce
forests

FR - thick aspen
woods



Hairy woodpecker

Keith McDougall

The Vermilion Lakes provide an ideal environment within Banff National Park for many species of migrating, resident, and breeding birds. April and May produce a heavy influx of migratory waterfowl - some remain to nest but the majority continue on to northern nesting grounds. The same migratory pattern, only southward, is not as evident in the fall. While some years the migration is light, during others it is heavy. Storms often bring species that might not otherwise stop.

Waterfowl are most abundant on Second Lake and the pond on the south side of the railroad tracks. First Lake has slightly fewer ducks and Third Lake has very few. In spring and fall, waterfowl that occur on First and Second Lakes are bothered by human visitors and will retreat to the back of the lakes (i.e. adjacent to the railroad tracks). In recent years the water level has fluctuated with the lowering and raising of the man-made dam at the outlet of First Lake into Willow Creek, Echo Creek, and the Bow River. In 1976, Willow Creek was dammed by beaver thus creating a flooded area at that end of First Lake. Water level greatly influences the number of shorebirds that may use the lakes.

The lakes area is used by migrating passerines although no major concentrations have been noted. The wetland areas support an abundant population of breeding birds. The Fenland has numerous thrushes, warblers, kinglets, chickadees and woodpeckers. Willow thickets are good areas for flycatchers, warblers and some sparrows. Sedge meadows are used by sparrows and some marsh species. Aspen forest along the road supports vireos, warblers, sparrows, and chickadees. Only the pine forest at the end of the Vermilion Lakes Road supports very few species.

The diversity of habitats and bird life in the Vermilion Lakes area makes it the most productive area in Banff National Park. Of the roughly 230 species of birds that are recorded for the park, 180 have been reported for the Vermilion Lakes area. White spruce, aspen and pine forests, willow thickets, sedge meadows, spruce-willow bog, and open willow are all present at the lakes. All of these habitats except pine forest are restricted in area in Banff National Park. Many bird species that live in these habitats are uncommon in the park: loon, red-necked grebe, American bittern, green-winged teal, cinnamon teal, bald eagle, osprey, kestrel, sora, great-horned owl, pygmy owl, saw-whet owl, yellow-bellied sapsucker, eastern kingbird, willow flycatcher, alder flycatcher, brown creeper, red-eyed vireo, Tennessee warbler, orange-crowned warbler, yellow warbler, Wilson's warbler, yellow-throat, grasshopper sparrow, white-throated sparrow, and Lincoln's sparrow. Many other species occur commonly in the Bow Valley, but not elsewhere in the park. It is therefore important to prevent the erosion of these habitats through such developments as the twinning of the Trans-Canada Highway.



ANNOTATED LIST OF BIRDS

The following definitions are adapted from Renaud and Renaud (1975).

ABUNDANCE SCALE

Status Birds occurring in such numbers that a competent observer at the appropriate time and place can see or hear in a single day:

abundant	more than 500
very common	101 to 500
common	26 to 100
fairly common	6 to 25
uncommon	1 to 5 (no more than 25 per season)
rare	1 to 5 (no more than 5 per season)

SEASONAL OCCURRENCE

resident	species that are known to breed or are suspected of breeding in the area
migrant	species that occur in the spring and/or fall but not during summer and winter
visitor	species that are not known or expected to breed in the area and do not classify as migrants
summer	species that occur in the spring, summer, and fall
spring	species that occur only in the spring
fall	species that occur only in the fall
winter	species that occur in the fall, winter, and spring
permanent	species that remain in the area all year

Scientific and common names are based on The Birds of Canada by W. Earl Godfrey.

LOONS Gaviidae

COMMON LOON *Gavia immer*

Summer visitor. Uncommon. Observed mainly during migration.
May nest. Mid-April to early October.

GREBES Podicipedidae

RED-NECKED GREBE *Podiceps grisegena*

Summer resident. Fairly common. Mostly migratory. Nests
observed on First and Third Lakes. Late April to October.

HORNED GREBE *Podiceps auritus*

Migrant. Fairly common. Late April to late May, mid-
September to late October.

EARED GREBE *Podiceps nigricollis*

Migrant. Rare. Late April to mid-May.

WESTERN GREBE *Aechmophorus occidentalis*

Migrant. Common. Early May to early June, late August to
late October.

PIED-BILLED GREBE *Podilymbus podiceps*

Summer resident. Fairly common. Nests. Early May to late
October.

PELICANS

WHITE PELICAN *Pelecanus erythrorhynchos*

Migrant. Rare. One record only, one bird, May 1974.

HERONS AND BITTERNS

GREAT BLUE HERON *Ardea herodias*

Summer visitor. Rare. Observed yearly but no more than one
bird at a time. August.

AMERICAN BITTERN *Botaurus lentiginosus*

Summer resident. Uncommon, though often heard. Must nest
but no records. Early May to mid-June.

SWANS, GEESE AND DUCKS

WHISTLING SWAN *Olor columbianus*

Migrant. Fairly common. Mostly during fall migration.
Early April to late May, October.

CANADA GOOSE *Branta canadensis*

Summer resident. Fairly common. Nests in early May. Has
been known to use osprey nest on First Lake. Mid-March to
October.

SNOW GOOSE *Chen caerulescens*

Migrant. Rare. Late April to early May.

SWANS, GEESE AND DUCKS (cont.)

MALLARD *Anas platyrhynchos*

Permanent resident, sometimes overwinters. The most common duck of the Vermilion Lakes. Nests in small numbers. Common during migration. Late April to late October.

GADWALL *Anas strepera*

Migrant. Rare. Early May, mid-October.

PINTAIL *Anas acuta*

Migrant. Uncommon. Late April to mid-May, October.

GREEN-WINGED TEAL *Anas crecca*

Summer visitor. Fairly common. May nest. Late April to early October.

BLUE-WINGED TEAL *Anas discors*

Summer visitor. Common. Observed mostly during migration. Nests. Late April to late August.

CINNAMON TEAL *Anas cyanoptera*

Summer visitor. Fairly common. Believed to nest. Late April to early July.

AMERICAN WIDGEON *Anas americana*

Migrant. Fairly common. Early April to mid-May, late September to early October.

NORTHERN SHOVELER *Anas clypeata*

Migrant. Fairly common. Late April to mid-May, September.

REDHEAD *Aythya americana*

Migrant. Uncommon. Early to mid-May, late September.

RING-NECKED DUCK *Aythya collaris*

Summer resident. Common. Nests. Early April to late October.

CANVASBACK *Aythya valisneria*

Migrant. Uncommon. Early April to late May, late September.

LESSER SCAUP *Aythya affinis*

Migrant. Uncommon. Late April to early June, mid-September to early October.

COMMON GOLDENEYE *Bucephala clangula*

Migrant. Common. Does not stay to nest. Occasionally overwinters. Mid-April to late May, November.

BARROW'S GOLDENEYE *Bucephala islandica*

Summer resident. Fairly common. Occurs mostly during migration. Some remain to nest. Early April to late October.

BUFFLEHEAD *Bucephala albeola*

Migrant. Fairly common. Has overwintered on occasion. Late April to November.

OLDSQUAW *Clangula hyemalis*

Visitor. Rare. Two records only, 1916(4) and 1978(1).

HARLEQUIN DUCK *Histrionicus histrionicus*

Migrant. Rare. One record September 1977.

WHITE-WINGED SCOTER *Melanitta deglandi*

Migrant. Fairly common but very irregular. Early May to late May, early October.

SWANS, GEESE AND DUCKS (cont.)

SURF SCOTER *Melanitta perspicillata*

Migrant. Rare. May.

RUDDY DUCK *Oxyura jamaicensis*

Migrant. Uncommon. Late April to early May, mid-August.

HOODED MERGANSER *Lophodytes cucullatus*

Migrant. Fairly common. Late May, early September to late October.

COMMON MERGANSER *Mergus merganser*

Summer resident. Uncommon. Nests. Occurs mostly on the Bow River. Mid-April to early October.

RED-BREASTED MERGANSER *Mergus serrator*

Migrant. Rare. Only observed during spring migration. Late April to mid-May.

HAWKS AND EAGLES Accipitridae

GOSHAWK *Accipiter gentilis*

Permanent resident. Rare.

COOPER'S HAWK *Accipiter cooperii*

Summer visitor. Rare. One record only, August 1977.

RED-TAILED HAWK *Buteo jamaicensis*

Summer visitor. Rare. May to September.

GOLDEN EAGLE *Aquila chrysaetos*

Permanent visitor. Very few winter records. April to October.

BALD EAGLE *Haliaeetus leucocephalus*

Summer resident. Rare. Nest at Vermilion Lakes since 1973. Late March to October.

MARSH HAWK *Circus cyaneus*

Summer visitor. Rare. Late April to mid-September.

OSPREY Pandionidae

OSPREY *Pandion haliaetus*

Summer resident. Uncommon. Nest at First Lake for many years. Early April to mid-October.

FALCONS Falconidae

MERLIN *Falco columbarius*

Summer visitor. Rare. One recorded observation June 1966.

AMERICAN KESTREL *Falco sparverius*

Summer resident. Uncommon. Nests. Mid-April to early September.

GROUSE AND PTARMIGAN Tetraonidae

RUFFED GROUSE *Bonasa umbellus*
Permanent resident. Uncommon.

RAILS AND COOTS Rallidae

SORA *Porzana carolina*
Summer resident. Uncommon. Nests. Due to its secretive nature, it is more often heard than seen. Mid-May to mid-August.

AMERICAN COOT *Fulica americana*
Migrant. Very common. Rare summer visitor. Late April to late October.

PLOVERS Charadriidae

KILLDEER *Charadrius vociferus*
Summer visitor. Uncommon. Nests. On occasion has wintered over around warm springs. Mid-March to August.

AMERICAN GOLDEN PLOVER *Pluvialis dominica*
Migrant. Rare. Two records only, May 1970 and May 1972.

SNIPES AND SANDPIPERS Scolopacidae

COMMON SNIPE *Capella gallinago*
Summer resident. Fairly common. Nests. Mid-April to early August.

LONG-BILLED CURLEW *Numenius americanus*
Rare. One record only, August 1966.

SPOTTED SANDPIPER *Actitis macularia*
Summer visitor. Uncommon. Mid-May to August.

SOLITARY SANDPIPER *Tringa solitaria*
Summer visitor. Rare. Records from May 1974 only.

GREATER YELLOWLEGS *Tringa melanoleuca*
Migrant. Uncommon. Mid-April to late August.

LESSER YELLOWLEGS *Tringa flavipes*
Migrant. Rare. Records from May 1974 only.

PECTORAL SANDPIPER *Calidris melanotos*
Migrant. Rare. One record only, September 1972.

LONG-BILLED DOWITCHER *Limnodromus scolopaceus*
Migrant. Rare. May to October.

PHALAROPES Phalaropodidae

WILSON'S PHALAROPE *Steganopus tricolor*
Migrant. Uncommon. Early May to late July.

NORTHERN PHALAROPE *Lobipes lobatus*
Migrant. Rare. One record only. May 1977.

GULLS AND TERNS Laridae

HERRING GULL *Larus argentatus*

Migrant. Rare. Two records only, August 1966 and October 1977.

CALIFORNIA GULL *Larus californicus*

Migrant. Rare. May to October.

RING-BILLED GULL *Larus delawarensis*

Summer visitor. Uncommon. Late July to early October.

FRANKLIN'S GULL *Larus pipixcan*

Migrant. Rare. Few recorded observations. May and August.

BONAPARTE'S GULL *Larus philadelphia*

Migrant. Uncommon. Few recorded observations. Late April to late May, early July and late September.

SABINE'S GULL *Xema sabini*

Migrant. Rare. One record only, September 1972.

FORSTER'S TERN *Sterna forsteri*

Migrant. Rare. Few recorded observations, 1966 and 1974. May to September.

COMMON TERN *Sterna hirundo*

Migrant. Uncommon. May and September.

BLACK TERN *Chlidonias niger*

Migrant. Uncommon. May.

PIGEONS AND DOVES Columbidae

MOURNING DOVE *Zenaida macroura*

Summer visitor. Uncommon. All park sightings have been in the Bow Valley. May to September.

OWLS Strigidae

GREAT HORNED OWL *Bubo virginianus*

Permanent resident. Uncommon. Has nested.

PYGMY OWL *Glaucidium gnoma*

Permanent resident. Rare. Has not been observed until recently at Vermilion Lakes. May nest. Late March to early July.

LONG-EARED OWL *Asio otus*

Rare. One record, May 1977.

SAW-WHET OWL *Aegolius acadicus*

Permanent resident. Rare. March.

GOATSUCKERS Caprimulgidae

COMMON NIGHTHAWK *Chordeiles minor*

Summer visitor. Uncommon. Occurs in small numbers in the lower Bow Valley. June to September.

HUMMINGBIRDS Trochilidae

RUFIOUS HUMMINGBIRD *Selasphorus rufus*

Summer visitor. Uncommon. Must nest near Second Lake beaver ponds. Mid-May to mid-August.

KINGFISHERS Alcedinidae

BELTED KINGFISHER *Megasceryle alcyon*

Permanent resident. Fairly common. Winters over occasionally. May nest.

WOODPECKERS Picidae

COMMON FLICKER *Colaptes auratus*

Summer resident. Fairly common. Nests. Mid-April to early September.

PILEATED WOODPECKER *Dryocopus pileatus*

Permanent resident. Rare.

LEWIS'S WOODPECKER *Asyndesmus lewis*

Spring and summer visitor. Rare. Two records only, May 1965 and June 1973.

YELLOW-BELLIED SAPSUCKER *Sphyrapicus varius*

Summer visitor. Uncommon. Nests at Second Lake. May to September.

HAIRY WOODPECKER *Dendrocopos villosus*

Permanent resident. Uncommon. One nesting record.

DOWNY WOODPECKER *Dendrocopos pubescens*

Permanent resident. Uncommon. No nesting records.

BLACK-BACKED THREE-TOED WOODPECKER *Picoides arcticus*

Winter visitor. Rare.

NORTHERN THREE-TOED WOODPECKER *Picoides tridactylus*

Permanent resident. Rare.

FLYCATCHERS Tyrannidae

EASTERN KINGBIRD *Tyrannus tyrannus*

Summer visitor. Fairly common. Nests. Mid-May to early September.

EASTERN PHOEBE *Sayornis phoebe*

Summer visitor. Rare. June and July observations.

SAY'S PHOEBE *Sayornis saya*

Summer visitor. Rare. All May sightings.

WILLOW FLYCATCHER *Empidonax trailii*

Summer visitor. Uncommon. Late May to mid-August.

ALDER FLYCATCHER *Empidonax*

Summer visitor. Uncommon. June to August.

LEAST FLYCATCHER *Empidonax minimus*

Summer visitor. Rare. May sightings.

FLYCATCHERS (cont.)

- DUSKY FLYCATCHER *Empidonax oberholseri*
Summer visitor. Rare. One record only, August 12, 1977.
- WESTERN WOOD PEWEE *Contopus sordidulus*
Summer visitor. Rare. July.
- OLIVE-SIDED FLYCATCHER *Nuttallornis borealis*
Summer visitor. Rare. One record only, May 1974.

SWALLOWS Hirundinidae

- VIOLET-GREEN SWALLOW *Tachycineta thalassina*
Summer resident. Fairly common. Feeds over lakes. May to mid-August.
- TREE SWALLOW *Iridoprocne bicolor*
Summer resident. Fairly common. Presumed to nest. Feeds over lakes. Early May to August.
- BANK SWALLOW *Riparia riparia*
Summer resident. Common. Sometimes nests. Feeds over lakes. Early May to early August.
- ROUGH-WINGED SWALLOW *Stelgidopteryx ruficollis*
Summer resident. Fairly common. Presumed to nest. Feeds over lakes. Early May to late July.
- BARN SWALLOW *Hirundo rustica*
Summer resident. Fairly common. Feeds over lakes. Late May to mid-August.
- CLIFF SWALLOW *Petrochelidon pyrrhonota*
Summer visitor. Common. Feeds over lakes. Late May to early August.

JAYS, MAGPIES AND CROWS Corvidae

- GRAY JAY *Perisoreus canadensis*
Permanent resident. Uncommon, but frequent throughout park.
- BLUE JAY *Cyanocitta cristata*
Visitor. Rare. One record only, May 1975.
- STELLER'S JAY *Cyanocitta stelleri*
Visitor. Rare. One record only, June 1977.
- BLACK-BILLED MAGPIE *Pica pica*
Permanent resident. Common. Nests.
- COMMON RAVEN *Corvus corax*
Permanent resident. Fairly common. Mostly observed in flight over the area.
- COMMON CROW *Corvus brachyrhynchos*
Summer visitor. Fairly common. Sometimes overwinters in townsite area. March to September.
- CLARK'S NUTCRACKER *Nucifraga columbiana*
Permanent resident. Uncommon, but frequent throughout park.

TITMICE Paridae

- BLACK-CAPPED CHICKADEE *Parus atricapillus*
Permanent resident. Common. May be observed regularly throughout the year.
- MOUNTAIN CHICKADEE *Parus gambeli*
Permanent resident. Fairly common. May be observed regularly throughout the year.
- BOREAL CHICKADEE *Parus hudsonicus*
Permanent resident. Fairly common. May be observed throughout the year.

NUTHATCHES Sittidae

- WHITE-BREADED NUTHATCH *Sitta carolinesis*
Permanent resident. Rare. One record only, November 1977.
- RED-BREADED NUTHATCH *Sitta canadensis*
Permanent resident. Fairly common.

CREEPERS Certhiidae

- BROWN CREEPER *Certhia familiaris*
Permanent resident. Uncommon.

DIPPERS Cinclidae

- AMERICAN DIPPER *Cinclus mexicanus*
Winter resident. Uncommon. Second Lake beaver ponds, Third Lake warm spring, and Forty Mile Creek.

WRENS Troglodytidae

- WINTER WREN *Troglodytes troglodytes*
Summer visitor. Rare. One record only, August 1975.
- LONG-BILLED MARSH WREN *Telmatodytes palustris*
Summer visitor. Rare. One record only, April 1978.

MOCKINGBIRDS AND THRASHERS Mimidae

- NORTHERN MOCKINGBIRD *Mimus polyglottos*
Visitor. Rare. One record only, May 1977. Second park record.
- GRAY CATBIRD *Dumetalla carolinensis*
Summer visitor. Rare. One record only, June 1966.

THRUSHES, SOLITAIRES AND BLUEBIRDS Turdidae

AMERICAN ROBIN *Turdus migratorius*

Summer visitor. Common. Nests. Occasionally overwinters.
Late March to mid-September.

VARIED THRUSH *Ixoreus naevius*

Migrant. Uncommon. Two records only, March and November
1977.

HERMIT THRUSH *Catharus guttatus*

Summer visitor. Rare. One record only, May 1977.

SWAINSON'S THRUSH *Catharus ustulatus*

Summer visitor. Uncommon. May to September.

VEERY *Catharus fuscescens*

Summer visitor. Rare. One record only, June 1974.

MOUNTAIN BLUEBIRD *Sialia currucoides*

Summer visitor. Fairly common. Observed mostly during
migrations. Early April to September.

TOWNSEND'S SOLITAIRE *Myadestes townsendi*

Permanent resident. Uncommon. Has been observed in winter
feeding on Juniper berries.

GNATCATCHERS AND KINGLETS Sylviidae

GOLDEN-CROWNED KINGLET *Regulus satrapa*

Permanent resident. Uncommon. Often in the company of
chickadees.

RUBY-CROWNED KINGLET *Regulus calendula*

Summer resident. Fairly common. Probably nests. Late
April to August.

PIPITS Motacillidae

WATER PIPIT *Anthus spinoletta*

Migrant. Uncommon. April-May.

WAXWINGS Bombycillidae

BOHEMIAN WAXWING *Bombycilla garrulus*

Winter visitor. Fairly common. May be observed in large
flocks (eg. 1000 in March 1978) November to early April.

CEDAR WAXWING *Bombycilla cedrorum*

Summer visitor. Fairly common. Late May to early
September.

SHRIKES Laniidae

NORTHERN SHRIKE *Lanius excubitor*

Usually spring migrant. Rare.

STARLINGS Sturnidae

COMMON STARLING *Sturnus vulgaris*

Summer resident. Fairly common. Nests. Competes with bluebirds, woodpeckers, owls for nesting sites. March to October.

VIREOS Vireonidae

RED-EYED VIREO *Vireo olivaceus*

Summer resident. Uncommon. June records only.

WARBLING VIREO *Vireo gilvus*

Summer resident. Fairly common. Mid-May to mid-August.

WOOD WARBLERS Parulidae

TENNESSEE WARBLER *Vermivora peregrina*

Summer resident. Rare. Two records only, May 1974 and July 1975.

ORANGE-CROWNED WARBLER *Vermivora celata*

Summer resident. Fairly common. Mid-May to mid-September.

YELLOW WARBLER *Dendroica petechia*

Summer resident. Fairly common. Late April to early September.

MAGNOLIA WARBLER *Dendroica magnolia*

Summer visitor. Rare. Two records only, May 1965 and May 1975.

YELLOW-RUMPED WARBLER *Dendroica coronata*

Summer resident. Fairly common, especially during migration. Late April to late September.

TOWNSEND'S WARBLER *Dendroica townsendi*

Summer resident. Uncommon. Nests. Late April to September

BLACK-THROATED GREEN WARBLER *Dendroica virens*

Migrant. Rare. One record only, April 1977. New park species.

PALM WARBLER *Dendroica palmarum*

Migrant. Rare. One record only, May 1974.

NORTHERN WATERTHRUSH *Seiurus noveboracensis*

Migrant. Rare. One record only, July 1970.

MACGILLIVRAY'S WARBLER *Oporornis tolmiei*

Summer visitor. Rare. One record only, May 1976.

COMMON YELLOWTHROAT *Geothlypis trichas*

Summer resident. Fairly common. Nests. Late April to early September. Typical bird of the area.

WILSON'S WARBLER *Wilsonia pusilla*

Summer resident. Uncommon. Mostly spring observations. Late May to early September.

CANADA WARBLER *Wilsonia canadensis*

Migrant. Rare. One record only, May 1977.

AMERICAN REDSTART *Setophaga ruticilla*

Migrant. Uncommon. Occurs on spring migration, May/June.

WEAVER FINCHES Ploceidae

HOUSE SPARROW *Passer domesticus*
Permanent resident in townsite. Rare at Vermilion Lakes.
One record only, August 1975.

MEADOWLARKS, BLACKBIRDS AND ORIOLES Icteridae

WESTERN MEADOWLARK *Sturnella neglecta*
Migrant. Rare. Spring sightings only.
YELLOW-HEADED BLACKBIRD *Xanthocephalus xanthocephalus*
Summer visitor. Rare. One record only, July 1967.
RED-WINGED BLACKBIRD *Agelaius phoeniceus*
Summer resident. Common. Nests on all three lakes. A
typical bird of the area. Late March to mid-August.
RUSTY BLACKBIRD *Euphagus carolinus*
Migrant. Rare. Two records only, October 1969 and May
1976.
BREWER'S BLACKBIRD *Euphagus cyanocephalus*
Summer resident. Fairly common. Early May to September.
BROWN-HEADED COWBIRD *Molothrus ater*
Summer resident. Fairly common. Early May to September.

TANAGERS Thraupidae

WESTERN TANAGER *Piranga ludoviciana*
Summer resident. Uncommon. May to August.

GROSBEAKS, FINCHES, SPARROWS AND BUNTINGS Fringillidae

ROSE-BREASTED GROSBEAK *Pheucticus ludovicianus*
Summer visitor. Rare. May and June observations.
EVENING GROSBEAK *Hesperiphona vespertina*
Winter visitor. Rare. One record only, October 1969.
PURPLE FINCH *Carpodacus purpureus*
Summer visitor. Rare. One record only, May 1973.
PINE GROSBEAK *Pinicola enucleator*
Winter visitor. Fairly common. Mid-August to March.
GRAY-CROWNED ROSY FINCH *Leucosticte tephrocotis*
Migrant. Uncommon. May be seen in large flocks during
spring and fall migrations. April.
HOARY REDPOLL *Acanthis hornemanni*
Winter visitor. Rare. One record only, January 1976.
COMMON REDPOLL *Acanthis flammea*
Winter visitor. Uncommon. Two records only, January and
December 1976.
PINE SISKIN *Spinus pinus*
Summer visitor. Fairly common. Erratic, some years does
not occur at all. Mid-April to late October.

- AMERICAN GOLDFINCH *Spinus tristis*
 Summer visitor. Rare. May to August.
- RED CROSSBILL *Loxia curvirostra*
 Winter visitor. Rare. Sightings in March, September and October.
- WHITE-WINGED CROSSBILL *Loxia leucoptera*
 Winter visitor. Uncommon. Sightings in December, January and March.
- SAVANNAH SPARROW *Passerculus sandwichensis*
 Migrant. Rare. One record only, May 1977.
- GRASSHOPPER SPARROW *Ammodramus saviarum*
 Migrant. Rare. One record only, May 1977.
- VESPER SPARROW *Pooecetes gramineus*
 Migrant. Rare. Prefers grassy meadows. Two records only, May 1974 and April 1975.
- DARK-EYED JUNCO *Junco hyemalis*
 Summer resident. Fairly common. Occurs mostly on migration. May overwinter around the townsite. March to October.
- TREE SPARROW *Spizella arborea*
 Spring migrant. Rare. Single birds observed in April and May 1976.
- CHIPPING SPARROW *Spizella passerina*
 Summer resident. Fairly common. Mid-May to mid-August.
- CLAY-COLORED SPARROW *Spizella pallida*
 Visitor. Rare. Two records only, May and August 1977.
- WHITE-CROWNED SPARROW *Zonotrichia leucophrys*
 Summer visitor. Fairly common. Late April to mid-September.
- GOLDEN-CROWNED SPARROW *Zonotrichia atricapilla*
 Migrant. Rare. One record only, May 1966.
- WHITE-THROATED SPARROW *Zonotrichia albicollis*
 Migrant. Rare. Three records only, one bird each, May 1975, October and November 1977.
- FOX SPARROW *Passerella iliaca*
 Summer visitor. Rare. One sighting only, May 1968.
- LINCOLN'S SPARROW *Melospiza lincolnii*
 Summer visitor. Rare. Believed to nest. Early May to August.
- SONG SPARROW *Melospiza melodia*
 Summer visitor. Fairly common. Nests. April to late September.
- SNOW BUNTING *Plectrophenax nivalis*
 Winter visitor. Fairly common. Occurs in large flocks. January to April.



Beaver

Keith McDougall

MAMMALS

The importance of the Vermilion Lakes area to many of the mammal populations of Banff National Park is undeniable. It provides range for moose, elk, sheep, and deer; maintains the park's major populations of muskrat, beaver, and mink; and is either home to or is visited by as many as twenty other species of mammals.

The numbers of elk, moose and sheep using the Vermilion Lakes area have decreased. Elk numbers are only one-third of previous counts; sheep are one-half their previous numbers; and moose may be on the verge of local extinction. While some of these decreases are related to population trends of these animals throughout the park, the animals in the Vermilion Lakes area have also been affected by habitat destruction, road kills, and human disturbance. Of special concern is the impact of the Trans-Canada Highway on the sheep range and on the sheep themselves (i.e. road kills).

The Vermilion Lakes area in particular is very important for the park's human visitors. It is one of the only wetland areas in the park which is easily accessible, and is therefore an important resource in the interpretation of many natural features, including mammal populations, to the park visitor.

ANNOTATED LIST OF MAMMALS

Common and scientific names are based on The Mammals of Canada by A.W.F. Banfield.

MASKED SHREW *Sorex cinereus*

Status of this shrew is unknown due to difficulties in studying small mammals by observation only.

AMERICAN PIKA *Ochotona princeps*

One confirmed sighting this year as well as several possible sightings in past years leads to the conclusion that one or more pikas have established residency in the rockfill below the highway. This is possibly the lowest altitude report for this species in Banff National Park.

SNOWSHOE HARE *Lepus americanus*

This animal is rare in the Vermilion Lakes area. One set of tracks was observed in the Fenland area during winter 1976/1977. No other observations were reported.

LEAST CHIPMUNK *Eutamias minimus*

This animal is widely distributed throughout the park north of the Bow River; however, appears to be scarce in the lakes area. Only one record could be located.

COLUMBIAN GROUND SQUIRREL *Spermophilus columbianus*

This species of ground squirrel is found throughout the park at all altitudes, and numerous colonies can be found along the grassy shores and slopes above all three Vermilion Lakes.

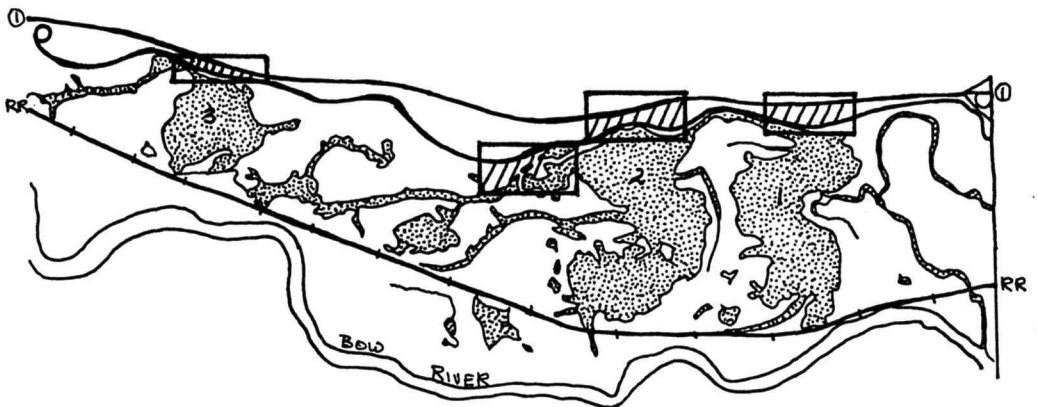


Figure 4. Key Columbian ground squirrel habitats in the Vermilion Lakes area.

GOLDEN-MANTLED GROUND SQUIRREL *Spermophilus lateralis*

This species was only recorded twice in the Vermilion Lakes area. It is common elsewhere in the park.

AMERICAN RED SQUIRREL *Tamiasciurus hudsonicus*

The red squirrel is very abundant in the woodlands of the area. The density is particularly high in the Fenland and in the coniferous woods along the river. (Figure 5). Spot mapping of squirrels during Fenland breeding bird surveys indicates that up to 28 squirrels inhabit this spruce forest.

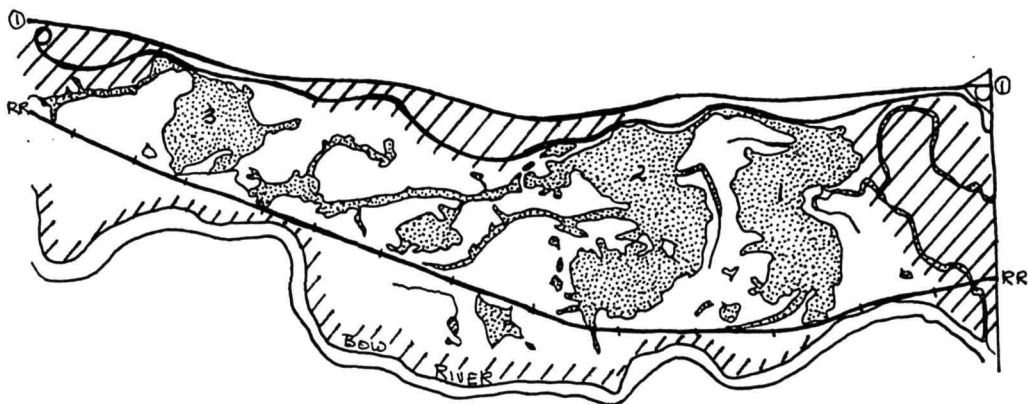


Figure 5. Key red squirrel habitats in the Vermilion Lakes area.

NORTHERN FLYING SQUIRREL *Glaucomys sabrinus*

This squirrel was observed only once, although a few animals may live in the area.

AMERICAN BEAVER *Castor canadensis*

The beaver first appeared in the lower Bow Valley around 1920. The growth of aspen which followed the extensive burns in the valley early in the century encouraged this immigration. The population grew rapidly and by 1924 the beaver was emigrating up Forty Mile Creek valley; however, twenty years later was confined to the Vermilion Lakes and the adjacent Bow River, having exhausted the food supply in other areas. At this time, Green estimated the population of beaver from the junction of the Bow and Cascade Rivers to Sawback at 248 animals. In 1950, he estimated the population of the same area to be 80 animals. (Green 1951:24).

The beaver population in the Vermilion Lakes area appears to have remained fairly stable for the past twenty years. In 1956 there were eight active colonies on the lakes with an estimated population of 40 animals. (Banfield 1958:20) During the summer of 1977 there were at least eleven active lodges, this being an increase of three over 1976.

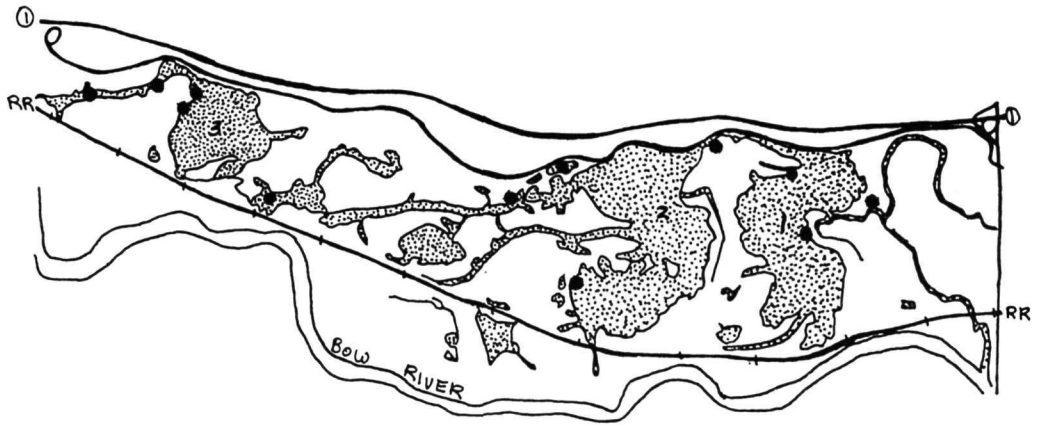


Figure 6. Active beaver lodges in the Vermilion Lakes area during summer 1977.

The beaver is very important to the Vermilion Lakes area. No other animal, except man, has had such a modifying effect on the area. Before the permanent dam was placed at the outflow of First Lake in 1950, the water level was maintained by a beaver dam. Water levels in large areas immediately west of the Fenland, the Second Lake and the Third Lake are maintained by beaver. The swampland and wet meadowland created by the activities of the beaver provide breeding habitat for many birds and the growth of willow in these moist areas provides food for the moose. The willow appears to be the main food source of the beaver itself. Most of the lodges are built some distance from aspen trees, the preferred food of the beaver. Examinations of the food caches near the lodges has revealed the use of willow, which is found throughout the Vermilion Lakes area.

DEER MOUSE *Peromyscus maniculatus*

The deer mouse appears to be common in the meadow areas near the lakes.

BUSHY-TAILED WOOD RAT *Neotoma cinerea*

The wood rat has been observed on two occasions during the past few years in the rockfill below the Trans-Canada Highway. One or more individuals are probably residents of this area.

GAPPER'S RED-BACKED VOLE *Clethrionomys gapperi*

Status of this vole is unknown due to difficulties in studying small mammals by observation only.

MUSKRAT *Ondatra zibethicus*

The muskrat is one mammal which, within Banff National Park, exists almost exclusively in the Vermilion Lakes. The First and Second Lakes are the only known bodies of water capable of supporting sizeable populations. (Figure 7). Great fluctuations

in numbers are typical of muskrat populations. The Park Warden Service reported a substantial population about 1937; however, Dr. James Hatter reported seeing very few in 1944. 1955, 1967, and 1976 also showed peak populations. Banfield attributed this phenomenon to climatic factors; while Green claimed that changes in water level were the cause. Insufficient information is available from this particular study to support or dispute either theory.

Currently the population of muskrat at Vermilion Lakes is high, numbering about 100. Large numbers were observed in the fall of 1976 and the mild winter that followed allowed for the survival of many. The greatest numbers are found along the bay on the northeast side of First Lake and at the south end of Second Lake. Few muskrat have ever been seen at Third Lake. This is probably due to a lack of a suitable food supply there. The vegetation in this lake differs from that of the other lakes, possibly due to the steeper shoreline.

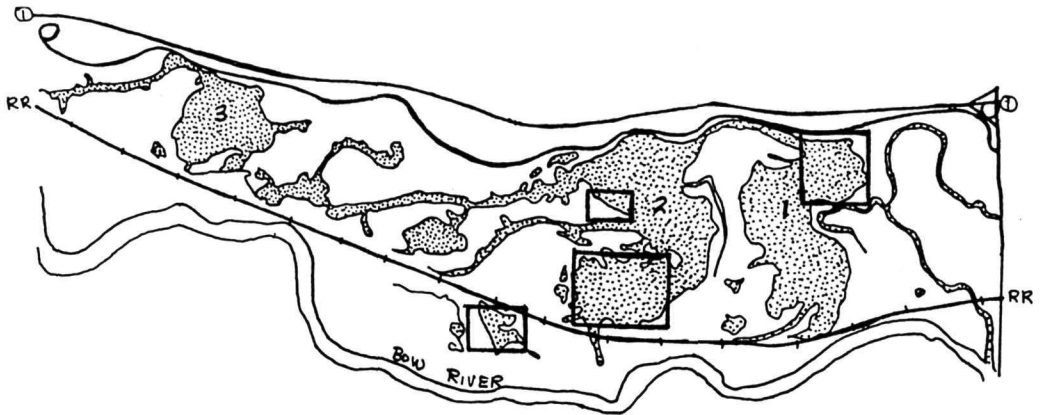


Figure 7. Areas of high concentration of muskrat activity (push-ups) during winter 1976-77.

MEADOW VOLE *Microtus pennsylvanicus*

Status of this vole is unknown due to difficulties in studying small mammals by observation only.

WESTERN JUMPING MOUSE *Zapus princeps*

Status of this vole is unknown due to difficulties in studying small mammals by observation only.

COYOTE *Canis latrans*

Coyotes are found throughout the park in the summer and in the lower valleys in the winter. The greatest concentration, however, appears to be in the lower Bow Valley in the vicinity of Banff. Coyotes are seen commonly in the Vermilion Lakes area, and have been particularly abundant during the last year, probably due to the large numbers of muskrat. Coyotes are known to feed on muskrat, other small mammals, and waterfowl in this area.

A coyote denning area exists on the levee which runs adjacent to the river. (Figure 8). This consists of two sites with four to six burrows in each. This site appears to have been used during the past year, as adults with young were observed there. Groups of up to six individuals have been heard calling on many occasions throughout the past summer from this levee area. The number of coyotes appears to be stable with five as the maximum likely to be observed on a single day.

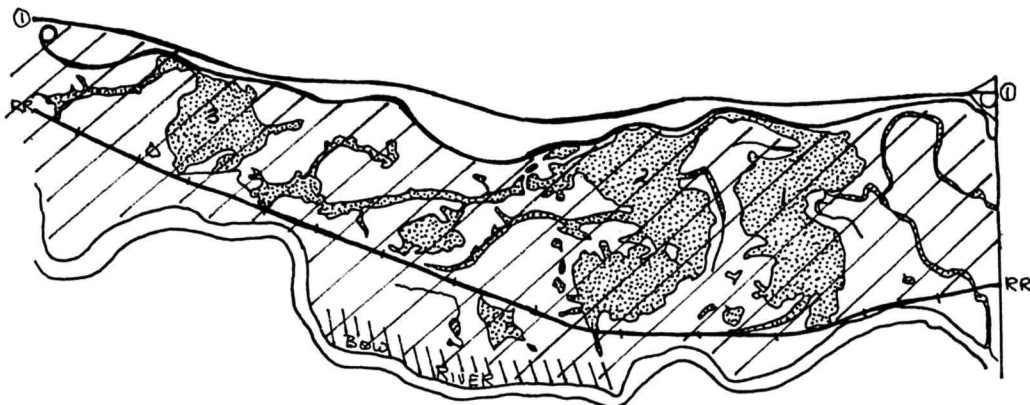


Figure 8. Key coyote habitats in the Vermilion Lakes area.

WOLF *Canis lupus*

The wolf moved into the lower Bow Valley about 1945 and by 1951 was considered well established in the Vermilion sheep range which includes the Vermilion Lakes. A province-wide rabies control program in 1952-53 greatly reduced the number. The wolf is now extinct in the Bow Valley, although lone animals may pass through going to other isolated areas of the park.

RED FOX *Vulpes vulpes*

In 1967 a red fox was killed on the Trans-Canada Highway above the Third Vermilion Lake. This species is very scarce in the park and this is the only observation for the Vermilion Lakes area.

AMERICAN BLACK BEAR *Ursus americanus*

The black bear is a common visitor to the Vermilion Lakes area, particularly in the spring. They are most often seen in the Fenland area, probably being attracted by the picnic area on Forty Mile Creek.

GRIZZLY BEAR *Ursus arctos*

This bear is a rare visitor to the lakes area, and like the black bear may be attracted to the garbage left behind by people, especially at the Forty Mile Creek picnic area.

AMERICAN MARTEN *Martes americana*

Marten have been observed rarely in the vicinity of the lakes and can be considered a visitor to the area.

ERMINE *Mustela erminea*, LONG-TAILED WEASEL *Mustela frenata*,
LEAST WEASEL *Mustela nivalis*

Although rarely seen, both the long-tailed weasel and the ermine are probably resident in the area. The status of the least weasel is unknown.

AMERICAN MINK *Mustela vison*

The mink is relatively scarce in the park. It is found almost exclusively in the Vermilion Lakes area. Mink have been observed most frequently on Forty Mile Creek and near First and Second Lakes.

RIVER OTTER *Lontra canadensis*

This species is extremely scarce in the park but has been observed in the lakes area on rare occasions.

COUGAR *Felis concolor*, LYNX *Lynx-lynx*

In 1949, Warden Green reported both cougar and lynx to be resident in the Vermilion sheep range. Both species have been seen in the vicinity of the lakes on rare occasions. The cougar appears to be on the verge of extinction in Banff National Park.

MULE DEER *Odocoileus hemionus*

The mule deer was first reported in the Bow Valley in 1858 by Dr. James Hector. They were considered to be abundant until the great increase in the population of elk in the 1930's, when their numbers dropped markedly. They have apparently never regained their former prominence, probably due to intense competition with elk, or to habitat succession, or both.

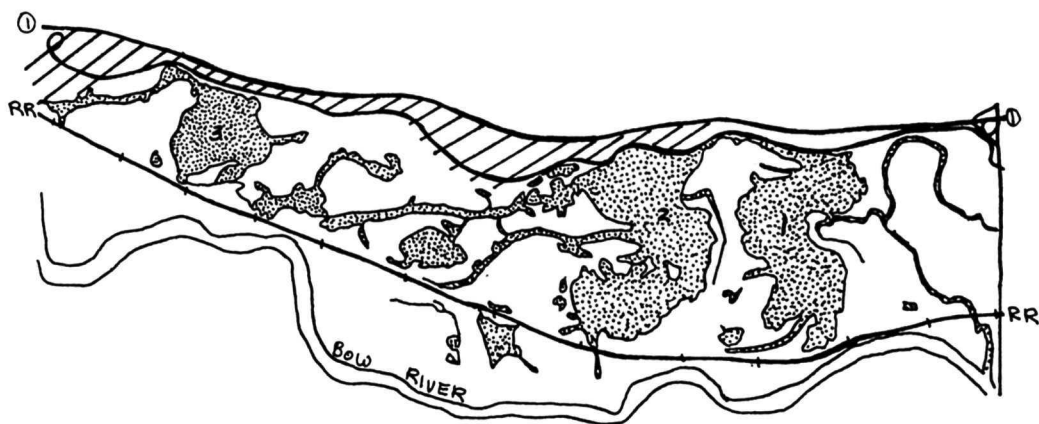


Figure 9. Key mule deer habitats in the Vermilion Lakes area.

The Vermilion Lakes area lies within the park's major mule deer wintering ground. While they have been seen in the study area throughout the year, they are more commonly observed during the spring, winter, and fall months browsing on aspen, willow, and other shrubs such as bearberry in the wooded areas north of the lakes and other areas not frequented by elk. (Figure 9).

Although mule deer were reported more frequently in recent years, the herd size has not changed since the mid-1940's. The maximum herd size of 16 was reported in 1971 and 11 were observed several times in 1977. The deer frequent the slopes above the lakes more than other parts of the study area.

WHITE-TAILED DEER *Odocoileus virginianus*

This deer is very rare in the park and only one observation has ever been recorded for the Vermilion Lakes

MOOSE *Alces alces*

The moose was not considered a resident of the lower Bow Valley and the park in general until the mid 1920's, although Hector reported them to be abundant in 1858. Fires in the early part of the century, including one in 1904 in the area of Vermilion Lakes, eliminated the climax spruce forest and provided for the subsequent growth of aspen. This new habitat encouraged the movement of the beaver into the area and close behind it, the moose. In 1949, Mair estimated the moose population of the area from Banff to 17-mile meadow to be 21. (Mair 1952:54).

The Vermilion Lakes area represents part of a major summer range for moose, with animals migrating from dry feed areas such as the Spray Valley to feed on the wet vegetation in the lakes area. Most have been observed feeding on willow and submergent vegetation in the lakes and channels and the areas around them.

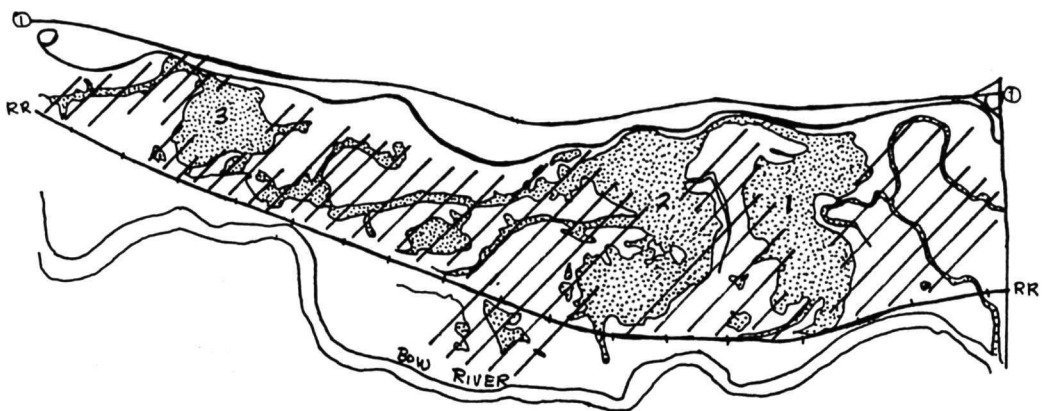


Figure 10. Key moose habitats in the Vermilion Lakes area.

There has been a startling reduction in the number of moose in the Vermilion Lakes area. Daily totals of 5 to 28 moose were often reported until 1956. Since then there have rarely been more than two reported. The last young was reported in December 1975 when it was found dead. During 1977, only two moose, a bull and a cow, inhabited the area.

WAPITI OR AMERICAN ELK *Cervus elaphus*

Although some elk were present in the Bow Valley when George Simpson visited in 1841, all available information indicates that they were extinct at the time the area was settled in the 1880's. However, between 1917 and 1920 a total of 251 elk were introduced into the Bow Valley. (Green 1954:2). Extensive fires in the valley in the early part of the century which removed the climax spruce forest resulted in a semi-open habitat more suitable to elk, and as a result the elk adapted very well. The population increased so dramatically that by 1943 it was considered necessary to begin a program of non-selective slaughter.

Elk are seen throughout the year in the Vermilion Lakes area, though more commonly in the winter. The lower Bow Valley is one of the major elk wintering grounds in Banff National Park. Within the study area the elk seem to prefer the upland forest and the meadow areas adjacent to the river. They are also commonly seen on both sides of the Norquay Road near the Vermilion Lakes turn-off. (Figure 11). The elk graze on several species of grasses, sedges, and herbaceous plants and browse on the leaves and twigs of deciduous trees and shrubs. Competition between elk and other ungulates has been inferred (Mair 1952, Green 1956, Banfield 1958); however, the extent of this competition in the Vermilion Lakes area cannot be discerned from this study. Each ungulate species does appear to use a different section of the area.

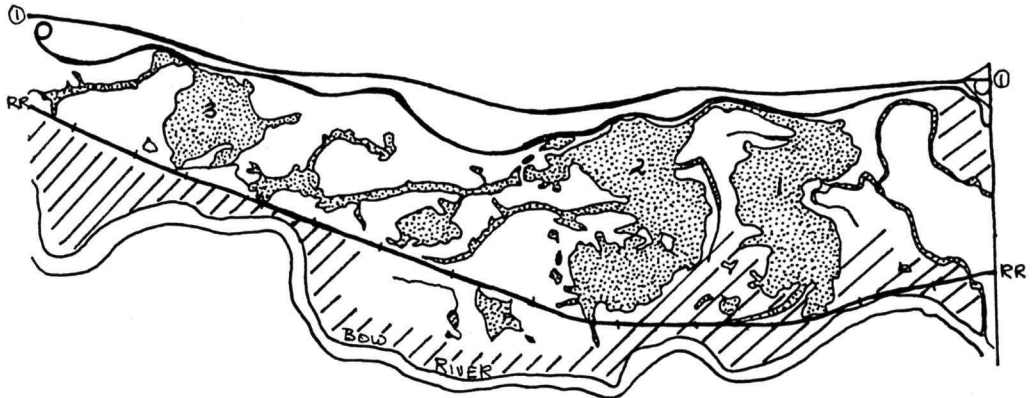


Figure 11. Key elk habitats in the Vermilion Lakes area.

The number of elk in the Vermilion Lakes area appears to have decreased in recent years. Banfield reported a herd of 88 elk adjacent to First Lake in December 1952 and J. Woledge noted 81 in November 1971. In 1974 and 1976 herds of 50 elk were reported. Twenty-five elk was the maximum seen in 1977 and there were many sightings of herds of only two to five. During the past year, elk were sighted more frequently between the railroad tracks and the Bow River and less often along the Vermilion Lakes Road. While more effort was made by those researching to visit the areas away from the road, this shift in feeding areas could indicate that the elk are reacting to increased human disturbance. Skiers and snowshoers are very common on the lakes proper, but rarely visit the river edge areas.

BIGHORN SHEEP *Ovis canadensis*

The Rocky Mountain bighorn sheep has inhabited the Banff area for as far back as man has recorded. According to Banfield, sheep ranges have changed little since first described in the early 1800's. However, the construction of the Trans-Canada Highway has damaged a portion of the range adjacent to the Vermilion Lakes.

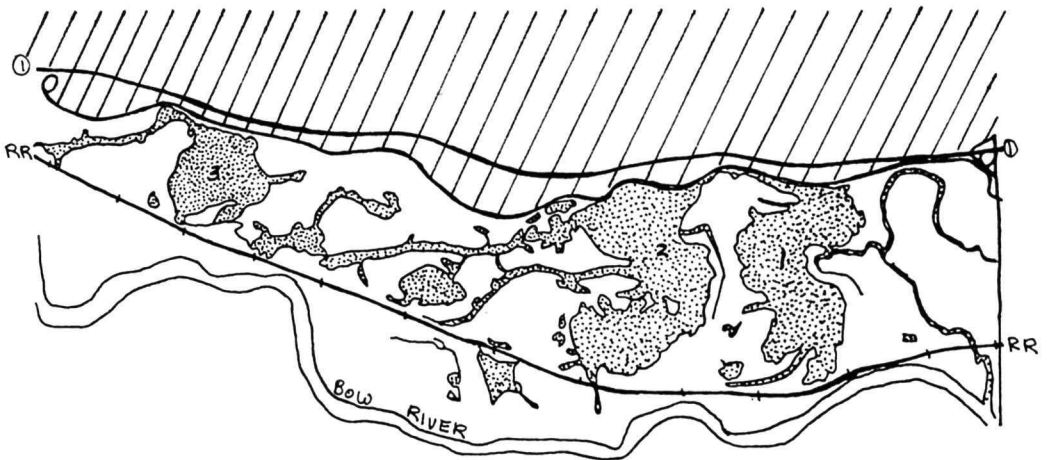


Figure 12. Key sheep habitats in the Vermilion Lakes area.

The Vermilion Lakes area lies within a major bighorn sheep range, known as the Vermilion range. This range extends from the lakes upwards to about 5000' in elevation and is approximately six miles in length. It includes a major mineral lick in the vicinity of the lakes. The semi-open slopes between the Vermilion Lakes and the Trans-Canada Highway comprise the main section of the study area utilized by the sheep. Here they feed on the grasses and sedges. (Figure 12). As sheep follow no well defined seasonal movements, they can generally be seen in the

area throughout the year, and are a definite attraction for human visitors. The highway, which runs through the sheep range, claims the lives of many animals each year and must therefore be viewed as a definite threat to the status of the bighorn sheep in this area.

The sheep appear to have changed their pattern of use in the lakes area. Before 1961 (pre Trans-Canada Highway), the vast majority of sightings of sheep were at Third Lake. Since the construction of the highway, sheep have often been seen above First and Second Lakes. If the area above Third Lake was preferred range, as it appears to have been before 1961, then the sheep must have had to broaden their use of the area after the construction of the Trans-Canada Highway.

Since 1974, herd size has decreased in the study area. Herds of over thirty animals were frequently seen until 1974. In the past three years the largest herd has consisted of 19 sheep. Since March 1975, only one herd with four young has been observed in the area. Virtually every report from 1945 to 1974 included sightings of young-of-year. The lack of young in recent years is cause for concern and should be studied.

Other Mammals

Although no written records could be located, we speculate that the following are also present in the Vermilion Lakes area: pygmy shrew, little brown bat, big brown bat, and the long-tailed vole.



Northern flying squirrel

REPTILES AND AMPHIBIANS

Of the five confirmed species of reptiles and amphibians in Banff National Park, all can be found within the Vermilion Lakes area. Although Vermilion Lakes is one of the lowest altitude, climatically-suitable areas in the park for these cold-blooded creatures, they are in most cases, not plentiful. The mountain habitat could be considered "fringe" at best. On the basis of our scanty knowledge of these species, it would appear that the Vermilion Lakes is near the edge of the ranges for all of them, and therefore their ecological limits of tolerance are worthy of future research. The interrelationship of these species with bird, mammal and fish life of the lakes is also worthy of future observation.

The Vermilion Lakes area is not critical to the survival of any of these five species in the park; however, the continued availability of such suitable habitat is very important. Also the high accessibility of the Vermilion Lakes area allows park visitors and residents alike first-hand experience of seeing and hearing these creatures.

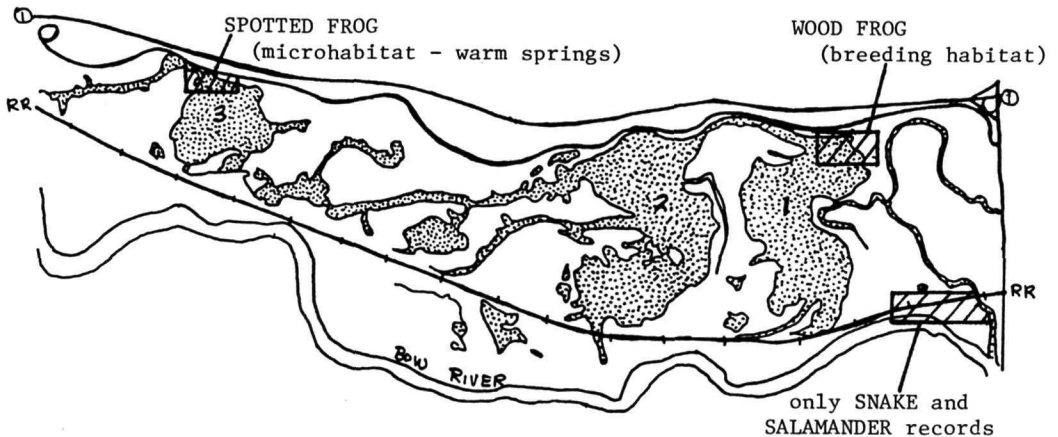


Figure 13. Key herptile habitats in the Vermilion Lakes area.

ANNOTATED LIST OF HERPTILES

Common and scientific names are based on A Field Guide to Western Reptiles and Amphibians by Robert C. Stebbins.

LONG-TOED SALAMANDER *Ambystoma macrodactylum*

As there are very few records for this species from the Vermilion Lakes area, it must therefore be considered rare. It is only found when searched for in specific habitats.

The long-toed salamander in Banff National Park seems to be restricted to the Bow Valley bottom as far west as Eisenhower Junction, and records beyond that point or in other valley systems do not yet exist. Its eastern-most range is also unknown, although they appear to extend east at least as far as Canmore.

BOREAL TOAD *Bufo boreas boreas*

This toad is found by searching or accident only. The wetlands, particularly the shoreline areas, provide breeding habitat during the key breeding months of May and June.

This species is fairly common throughout Banff National Park and utilizes a wide range of habitats and altitudes, from valley bottom to above treeline. Vermilion Lakes does not appear to have any special significance for this species. On a wider regional basis, this species is probably near the eastern fringe of its range.

WOOD FROG *Rana sylvatica*

The wood frog appears to be widely distributed in valley bottoms throughout Banff National Park, although it is considered uncommon. The major period of observation is during the breeding season, from mid-April to mid-May or later, when this species congregates in key shallow parts of the lakes (i.e. east end of First Vermilion Lake - see Figure 13) for mating and egg laying. It is rarely observed at other times during the summer, as it is a terrestrial species.

SPOTTED FROG *Rana pretiosa*

This aquatic species is uncommon in the Vermilion Lakes area and appears to have a restricted distribution. There are few records of it being seen anywhere other than in the outflow of a small sulphur thermal spring at Third Lake. It has been observed there from early spring (March 27) to June.

This species is near the eastern edge of its range in Canada, and the Vermilion Lakes population is the eastern edge of the range within Banff National Park. It appears to be widely distributed in lakes throughout the valleys of the park, with a fairly wide altitudinal tolerance. The microhabitat preference at Vermilion Lakes (Third Lake - warm sulphur spring outlet, Figure 13) requires further research to determine its significance, if any.

Life history, voice records, etc. of the spotted frog are poorly documented in Canada and the local population could contribute to the broader knowledge base for this species.

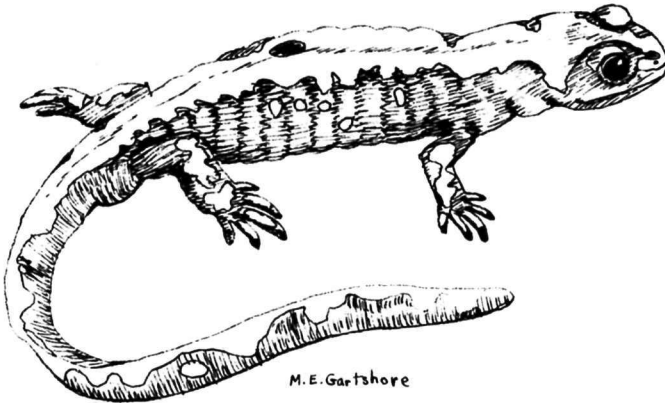
WANDERING GARTER SNAKE *Thamnophis elegans vagrans*

In spite of the amount of time spent in the field by BVN club members this season, no snakes were observed in the study area. Although suitable snake habitat certainly exists, there is only one specific record of a snake from this area (May 1968 - see Figure 13). Perhaps future observations will confirm more widespread occurrence in less accessible areas.

The wandering garter snake is the only known snake species in Banff National Park. Based on existing knowledge, the range of this snake is from the Cave and Basin marshes in the Bow Valley, eastward to Lake Minnewanka and the Ghost Lakes. Nowhere is it common, although it is most plentiful in the Cave and Basin area. On a wider regional scale, this species seems to be restricted to the Rocky Mountain region within Alberta, so in effect occupies a narrow ecological band along the southwestern fringe of the province.

Other Herptiles

Although there are no records for either the Vermilion Lakes area or the park as a whole, the following are possibly resident in the study area: Canadian (Dakota) toad, tiger salamander, and leopard frog. The painted turtle, for which there is one record, can be considered accidental (introduced).



Long-toed salamander

FISH

Species list of fish found in the Vermilion Lakes.

Common and scientific names (except for the mosquito fish) are based on Freshwater Fishes of Canada by W.B. Scott and E.J. Crossman.

FIRST LAKE

Cutthroat trout *Salmo clarki*
Brook trout *Salvelinus fontinalis*
Dolly varden *Salvelinus malma*
Longnose sucker *Catostomus catostomus*
Rocky Mountain whitefish *Prosopium williamsoni*
Stickleback sp.

SECOND LAKE

Brook trout *Salvelinus fontinalis*
Dolly varden *Salvelinus malma*
Longnose sucker *Catostomus catostomus*
Rocky Mountain whitefish *Prosopium williamsoni*
Stickleback sp.

THIRD LAKE

Rainbow trout *Salmo gairdneri*
Cutthroat trout *Salmo clarki*
Brook trout *Salvelinus fontinalis*
Dolly varden *Salvelinus malma*
Longnose sucker *Catostomus catostomus*
Rocky Mountain whitefish *Prosopium williamsoni*
Stickleback sp.
Mosquitofish *Gambusia affinis*

REFERENCES

- Aitken, J.D. 1968. Pre-Devonian history of the southern Rocky Mountains. 16th Ann. Field Conf. Alberta Soc. Pet. Geol., Calgary, pp. 15-28.
- Aitken, J.D. and R.G. Greggs. 1967. Upper Cambrian formations, southern Rocky Mountains of Alberta, an interim report. Geol. Surv. Canada Paper 66-49, Ottawa.
- Allan, J.A. 1943. The relation of the geology to the soils in the Rosebud and Banff sheets. Univ. Alberta Coll. Agr. Bull. 40, Edmonton, pp. 102-119.
- Anderson, R.S. 1974. Crustacean plankton communities of 340 lakes and ponds in and near the National Parks of the Canadian Rocky Mountains. J. Fish. Res. Board Canada. 31: 855-869.
- Baird, D.M. 1967. Banff National Park-How Nature Carved Its Splendour. Geol. Surv. Canada Misc. Rep. 13, Ottawa.
- Banff National Park. 1945 - 1976. Wildlife observation cards. (BNP) Banff National Park Warden Service. 1955, 1957. Wildlife notes. (ACR)
- Banfield, A.W.F. 1958. The Mammals of Banff National Park, Alberta. Nat. Mus. Canada Bull. 159.
- Banfield, A.W.F. 1974. The Mammals of Canada. Nat. Mus. Canada, Univ. Toronto Press, Toronto.
- Beylea, H.R. 1964. The Story of the Mountains in Banff National Park. Geol. Surv. Canada, Ottawa.
- Caine, W.S. 1892. A Trip Round the World in 1887-88. George Routledge and Sons Ltd., London.
- Canada. 1886 - 1935. Department of the Interior, National Parks Report. Government Printing Bureau, Ottawa.
- Cormack, R.G.H. 1977. Wildflowers of Alberta. Hurtig Publishers, Edmonton.
- Crag and Canyon. 1901 - 1950. Weekly newspaper. Banff, Alberta. (ACR)
- Godfrey, W. Earl. 1966. The Birds of Canada. Nat. Mus. Canada Bull. 203, Supply and Services Canada, Ottawa.
- Gordon, Bruce. 1975. Birds of Banff. typewritten. (BNP)
- Green, Hubert U. Notes on early wildlife records etc. Banff National Park. handwritten 16pp. (ACR)
- _____ 1950. The bighorn sheep of Banff National Park. National Park and Historic Sites Service, Development Services Branch, Dept. of Resources and Development, Ottawa.
- _____ 1951. Occurrence, distribution and population of mammals, Banff National Park. typewritten 28 pp. (ACR)
- _____ 1955. The moose of the Banff National Park, Alberta. typewritten 44 pp.
- _____ 1956. Notes on the elk of Banff National Park. National Parks Service, Dept. of Northern Affairs and National Resources, Ottawa.
- Hatter, James. 1944. Field notes. (BNP)
- Hearle, Eric. 1924. Controlling mosquito pests in mountain resorts. Canadian Alpine Journal, vol. XIV pp. 75-81.

- Janz, B. and D. Storr. 1977. The Climate of the Contiguous Mountain Parks. Atmospheric Environment Service, Dept. of Env. Proj. Rep. 30, Toronto.
- Luxton, Eleanor. 1975. Banff - Canada's First National Park. Summerthought, Banff.
- Macqueen, R.W. and E.W. Bamber. 1967. Stratigraphy of Banff formation and lower Rundle group (Mississippian), southwestern Alberta. Geol. Soc. Canada Paper 64-47.
- Mair, W.W. 1952. The impact of an introduced population of elk upon the biota of Banff National Park. MSc. thesis, Univ. British Columbia, Vancouver.
- McGugan, A. and J.E. Rapson. 1960. Stratigraphy of the Norquay formation, Rocky Mountain group, Banff area, Alberta. Jour. Alberta Soc. Pet. Geol. 8(1).
- _____ 1961. Stratigraphy of the Rocky Mountain group (Permo-Carboniferous), Banff area, Alberta. Jour. Alberta Soc. Pet. Geol. 9(3): 73-106.
- McTrowe, Don. 1977. The history of fish stocking of Vermilion Lakes, Banff National Park. typewritten 12pp. (BNP,ACR)
- Moss, E.H. 1959. Flora of Alberta. Univ. Toronto Press, Toronto.
- North, F.K. and G.G.L. Henderson. Summary of the geology of the southern Rocky Mountains of Canada. Alberta Soc. Pet. Geol., Calgary.
- Oosting, H.J. 1956. The Study of Plant Communities. W.A. Freeman and Co., San Fransisco.
- Palliser, John. 1893. The journals, detailed reports and observations relative to the explorations by Captain Palliser. George Edward Eyre and William Spottiswoode, London.
- Porsild, A.E. 1974. Rocky Mountain Wildflowers. Nat. Mus. of Nat. Sci., Nat. Mus. of Canada and Parks Canada, Dept. of Indian and Northern Affairs, Ottawa.
- Rapson, J.E. 1962. The petrology of Pennsylvania chert breccias and conglomerates; Rocky Mountain group, Banff, Alberta. Jour. Sed. Petrol. 32: 249-262.
- Renaud, W.E. and D.H. Renaud. 1975. Birds of the Rosetown-Biggar district, Saskatchewan. Spec. publ. #9, Saskatchewan Nat. Hist. Soc., Regina.
- Rutter, N.W. 1965. Superficial geology of the Banff area, Alberta. PhD. thesis, Univ. Alberta, Edmonton.
- _____ 1966. Glacial history of the Bow River Valley, Banff area, Alberta. Canadian Alpine Jour. 49: 157-173.
- _____ 1966. Multiple glaciation in the Banff area, Alberta. Bull. Canadian Pet. Geol. 14(4): 620-626.
- _____ 1969. A late-Pleistocene glacial advance, Bow Valley, Canadian Rocky Mountains, Alberta. Quaternary Geology and Climate. Natl. Acad. of Sci. Publ. 1701, Washington, pp. 104 - 109.
- _____ 1970. Multiple glaciation in the Banff area, Alberta. Bull. Geol. Surv. Canada.
- _____ 1970. Quaternary geology road logs - Banff area, Alberta. Geol. Surv. Canada Paper 70-67.

- Scott, W.B. and E.J. Crossman. 1973. *Freshwater Fishes of Canada*. Fisheries Research Board of Canada, Dept. of Env., Ottawa.
- Stebbins, Robert C. 1966. *A Field Guide to the Western Reptiles and Amphibians*, Peterson Field Guide Series. Houghton Mifflin Co., Boston.
- Stelfox, John G. 1969. Status of the bighorn sheep at Vermilion Lakes, Banff National Park. Canadian Wildlife Service.
- Westgate, J.A. and A. Dreimanis. 1967. Volcanic ash layers of recent age in Banff National Park, Alberta, Canada. *Canadian Jour. Earth Sci.* 4(1): 155-161.
- Wilcox, Walter D. 1909. *The Rockies of Canada*. G.P. Putnam's Sons (The Knickerbocker Press), New York.

ACR - available only at Archives of the Canadian Rockies, Banff, Alberta.

BNP - available only at Banff National Park Library, Banff Administration Building.



Ida Paris on Boulder Creek (channel between First and Second Lakes), 1899

Photograph by George Paris

Project coordinators: Geoffrey Holroyd and Michael McIvor

Researchers: Janet Amy, Evlyn Annand, Vicki Aziz, Hazel Bell, Wendy Bradley, Allan Brooks, Gordon Burles, Ed Carlton, Neil Colgan, Ross Dobson, Sally Dobson, Halle Flygare, Mary Gartshore, Bruce Gordon, Ruth Gordon, Aileen Harmon, Elizabeth Holroyd, Geoffrey Holroyd, Hazel Hutchins, Ted Hutchins, Joan Jenkins, Cecilia Kraby, David Kraby, Rachel Laframboise, Margot Lowe, Diane McIvor, Michael McIvor, Keith McDougall, Margery McDougall, Barry Morrison, Harold Mortimer, Nancy Murray, Bunty Nelson, Jenny Nilsson, Sheila Robinson, Mary Tubb, Gerry Wilkie, Art Wilson

Report preparation: Ross Dobson, Bruce Gordon, Geoffrey Holroyd, Lionel Jackson, David Kraby, Margery McDougall, Diane McIvor, Michael McIvor, Barry Morrison

Publication design and editing: Margery McDougall with assistance from Jon Whyte

Clerical assistance: Ruth Gordon, Pauline Martin, Kenneth Mouré, Nancy Murray

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A lake is the landscape's most beautiful and expressive feature. It is the earth's eye; looking into which the beholder measures the depth of his own nature.

Henry David Thoreau, Walden

An active natural history and conservationist group, the Bow Valley Naturalists has been in existence since 1966 and has a membership of approximately one hundred residents of the Canadian Rockies. Among its many activities are natural history lectures by invited experts, hikes and observation in the vicinity of the Bow Valley and the Rockies, and the preparation of briefs to governments on a variety of conservation oriented subjects.

The club's objectives are to acquire and disseminate knowledge on natural history, to work for the protection and preservation of natural areas and wildlife, and to stimulate interest in the appreciation of nature. The Bow Valley Naturalists is a founding corporate member of the Federation of Alberta Naturalists. Vermilion Lakes is the club's second publication.

