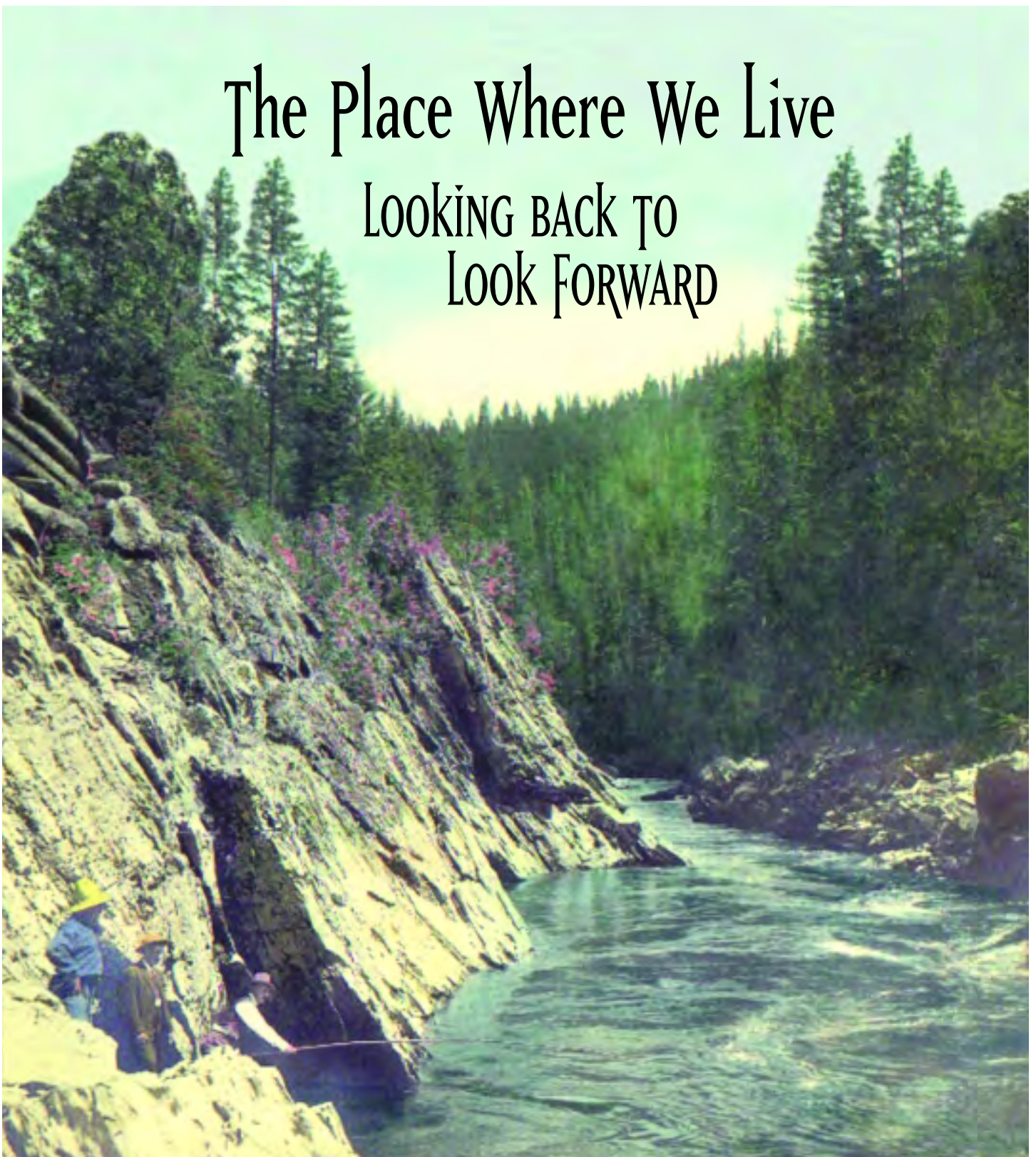


The Place Where We Live

LOOKING BACK TO
LOOK FORWARD



SALMO WATERSHED
Streamkeepers
SOCIETY

THE PLACE WHERE WE LIVE:
LOOKING BACK TO LOOK FORWARD

We're all downstream.

— *Ecologists motto, adopted by Margaret and Jim Drescher
Windhorse Farm, New Germany, Nova Scotia*

Cover Photo — Fishing on the Salmo River — early 1900's.

PHOTO COURTESY OF TRAIL CITY ARCHIVES

INSET PHOTOS COURTESY OF BERNARINE STEDILE AND THE SALMO MUSEUM



Gerry and Alice Nellestijn at Wulf Lake — September Long Weekend 1999

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This book is a direct result of the Salmo Watershed Streamkeepers Society’s (SWSS), Salmo Watershed Assessment Project also known as the “Partnership Proposal For Youth Services Canada Project: Youth Jobs With a Purpose.” SWSS activated funds to employ eight youth for the summer of 1999. This book emerged from expectations and interests from our staff and youth team. We hope you enjoy it. We are grateful for our partnership with the scientific community and Human Resources Development Canada. For SWSS and our Youth, the summer of 1999 is a year that we will all remember, thanks to you.



PREFACE

In the summer of 1999, the Salmo Watershed Streamkeepers Society (SWSS) partnered with Human Resources Development Canada (HRDC) to carry out an assessment of the Salmo River Watershed. This assessment was conducted to tell us 'what is' the condition of the environmental habitat of our mainstem, tributaries and riparian area (the zone of influence between the land and water). SWSS was confused by the decline of fish populations in the Salmo River, especially the blue listed (threatened) bull trout (Dolly Vardon). We saw HRDC's Youth Services Canada (YSC) portfolio as the perfect match to drive this search. YSC encourages youth career development opportunities that leave the receiving community with a lasting legacy. This history is part of that legacy; the assessment itself is another part, as is a report on the Harlequin Duck, a beautiful bird that migrates here from the sea to rear its young. Some of our youth group were also involved in a radio telemetry study of bull trout. This is an intensive activity using high tech equipment to identify spawning and overwintering areas; a report based on this study will be finalized by the fall of 2000. Copies of this history, along with the Harlequin Duck and the Bull Trout Radio Telemetry reports, will be available at the Salmo Public Library as they are completed. The data from our assessment is available from the Dept. of Fisheries and Oceans' environmental habitat data web site at http://habitat.pac.dfo.ca/pskf/version4_0/system/skmenu1.cfm. Click on stream survey query.

Our youth group, as young folks tend to be, were a group of forward thinkers, keen and energetic. Part of our assessment called for historical data. We felt a responsibility to have this team gain at least an overview of what it used to be like in the Salmo Valley. We saw the history as an opportunity for members of the group to learn to take control of something of their own to research, to interview, to write and to express themselves. We wanted them to get a sense of the difficulties and the joys of our First Nations and of our pioneers, and to become familiar with the activities and the economies that drove development in our watershed. We asked them to look back, not to judge, but to understand. Most of all, we hoped they would be able, to some degree, to see through the eyes of our elders, to develop a sense of nostalgia, compassion and caring. The reader must judge how successful they were.

The history itself is an overview. Each student pursued his or her task with their own degree of detail; personal styles shine through. The work is by no means definitive. These are not the works of professional historians, but of interested young people. Please forgive any errors or omissions. The First Nations creative writing elements at the beginnings of each chapter are the wonderful works of Meredith Pritchard. We find her writing to be sensitive and insightful. We in no way believe she speaks for, or necessarily captures, First Nations sentiment. What is obvious is that she cares, and has a unique ability to put us in a 'place.' These are qualities shared by all our young writers.

Finally, I hope that, even though you did not have the joy as I did, to see this group emerge from confusion to a working team, you will share the sense of pride that I have for these young men and women.

Thank you all for the experience.

Gerry Nellestijn, Editor
President/Coordinator
Salmo Watershed Streamkeepers Society





Salmo Watershed Youth Assessment Team (also known as The SWAP Squad)

Left to Right: Trevor Rushka, Chris Atha, Darcy Torrans, Vernon Cox, Christine Gilliland, Doug Ellis, Project Coordinator, Kurtis Black, Meredith Pritchard, Mike van Wijk



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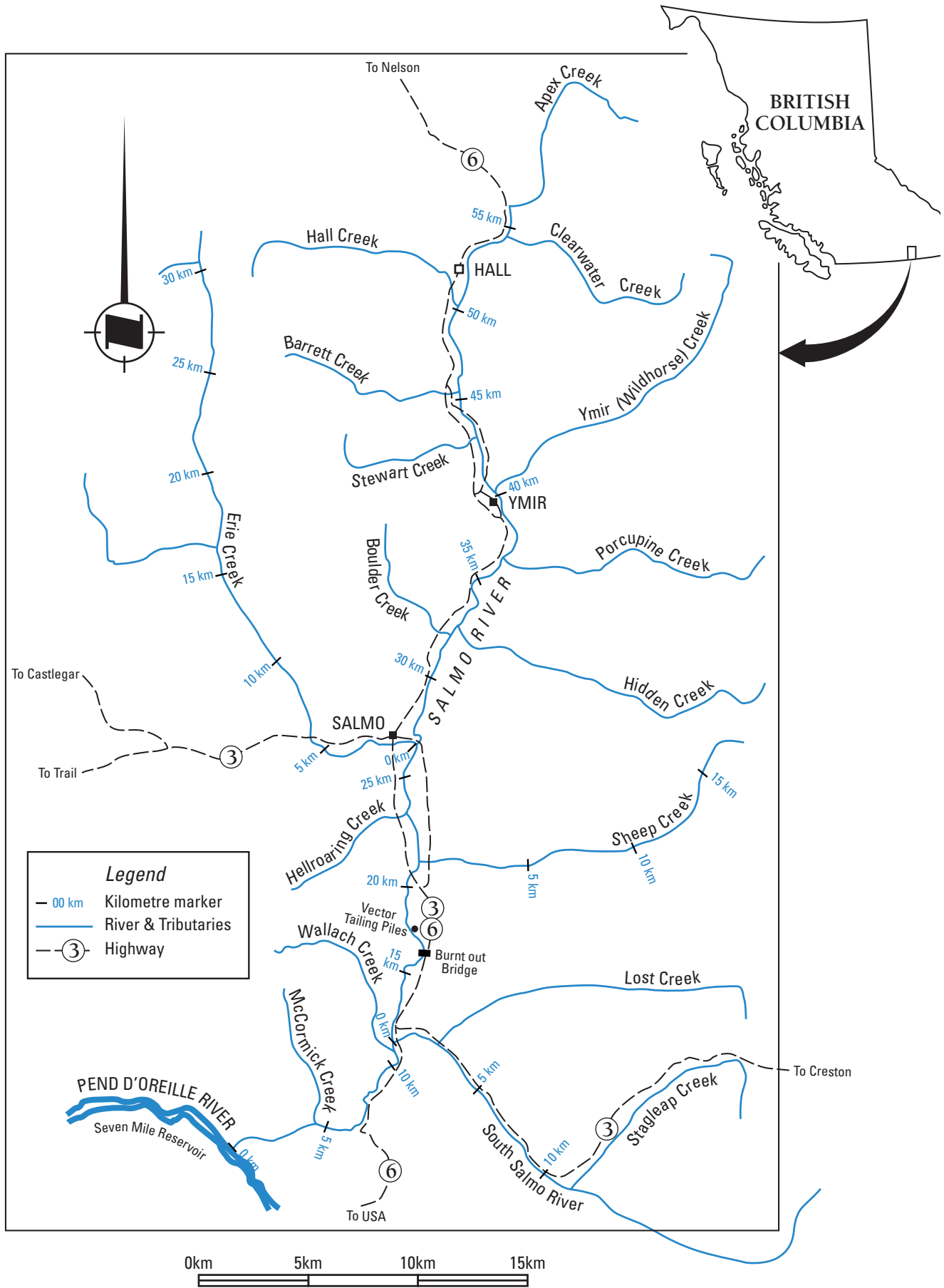
And finally, I would like to recognize Gerry Nellestijn, it was his idea and determination that led to the production of this book. It is in part, a symbol for his love and respect for The Place Where We Live.

Thank you.

Doug Ellis

Salmo Watershed Assessment Project Coordinator

SALMO RIVER WATERSHED MAP





Old wagon road through Stagleap Park Ranch near Salmo British Columbia — 1890's. PHOTO COURTESY OF BERNARINE STEDILE

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FIRST NATIONS OF THE
SALMO VALLEY AND
SURROUNDING AREA

PREPARED BY:
Meredith Pritchard
Salmo Watershed Assessment Youth Team



Indian pictograph. PHOTO COURTESY OF SWSS

Creative writing elements introducing most chapters are by Meredith Pritchard



My peoples history, like that of all Indians has been a troublesome one. A long time ago, and for a long time before that we lived as we had always lived, in humble accordance with the ways of the Great Spirit. There stirs in my blood the remnants of a unique culture, mysterious, noble and yet forever altered.

As a child my Grandfather told me with a twinkle in his eye and spittle on his chin that we had sprouted from the moist shadowy crevices, and had been gifted from the sky, born unto eagles and osprey.

He told me many stories. Some he knew were very old...





IN THE DAYS BEFORE PEOPLE, THERE LIVED A WATER MONSTER IN KOOTENAY LAKE.

When he was hungry, he would swim the length of the Arrow Lakes, then north along the Columbia near to what is now Golden; then he would continue south to Columbia Lake and follow the Kootenay River back home.

Canal Flats didn't exist in this time, so the two rivers flowed into one. Throughout his journey, the Water Monster ate all the creatures in the water and on the land. The creatures, frightened and concerned, appealed to the Great Spirit "Nalmu'qtse" for help. He told them he would kill the Water Monster with their aid. When the Great Spirit and the animals went to the Water Monster's lair, he swam away, heading southwards and coming upon a small creek. He began swimming towards the headwaters of the creek, trying to lose his pursuers, but Nalmu'qtse cornered him and hurled his spear, striking the Monster in the leg. The Monster retreated back downstream leaving a trail of blood, hence the name "Aiknosuka," or the present day name Red Creek, North of Lake Windermere. Water Monster fled south and turned and swam up Morgean Creek. The Creatures then gathered at the mouth of the stream while the Great Spirit sent Coyote to chase the Water Monster out. Water Monster dug a very deep hole at the headwaters of the creek and tried to hide. The hole is still there. When Coyote, "the Cowardly One," tried to stop Water Monster from digging, he roared, and Coyote ran away. Water Monster swam downstream and back into the Columbia. The Great Spirit soon realized that they would only be chasing him around and around, so he went to the south end of the Columbia and scraped together earth and rocks, making what is now Canal Flats. Water Monster soon discovered he was trapped. Coyote, wanting to redeem himself, attacked the Monster with his tomahawk, but once again grew frightened and retreated. Fox picked up the tomahawk and hit Water Monster square on the head. At this point, all the Creatures jumped on him and tore him to pieces. You can still see the red spot on the southeast shore of Columbia Lake where Water Monster was killed. The Great Spirit picked up a handful of the dried blood and hurled it eastward towards the Mountains, declaring that it would be transformed into a new race of people with red skin. Wherever the pieces fell, they became a tribe of Indians known as the Kootenays.



ORIGINS

There is certainly some discrepancy as to the origins of the Kutenai Indians, even as far as where their name is derived from. Kutenai has been translated from the Athabaskan "coo," meaning water, and "tinneh," meaning people; "People of the Lakes." Kutenai may also be a derivative of the ancient word "Ktunaxa" (etymology unknown), referring to a group of people who once originated east of the Rockies.

It is written that some elders testify to "Kutenai" as being a Piegan (warring tribe from Alberta) word meaning "to travel by water." In as far as the Kutenai canoe, or sturgeon-nosed canoe, being very unique in its design, it draws very noticeable similarities to a type of canoe found in the Amur River area in Siberia. "The Kutenai style of canoe building is now accepted as proof that the North American Indians immigrated from Asia via Siberia and Alaska" (from "Kutanai Canoe," by J.B. Carmichael, 1973).

It is unclear as to whether or not the Kutenais had their tribal origins east of the Rockies and were driven here in comparatively recent times; however, it appears as though at least some would have descended from a Plains type culture. "The influence of the Plains can be readily discerned, yet the foundations are distinctive...the Kutenai possess a culture in many respects peculiar to themselves" (Curtis, 1887).

If this were the case, and the Kutenai are descendants of Plains Indians, then according to archeological evidence, there must have been earlier inhabitants. Their migration would have been gradual, the initial group consolidating at Tobacco Plains and then spreading to the north and south.

According to an early report by A.F. Chamberlain (1885-1887), the Kootenays believed they came from the east, their myth ascribing them to have originated from a hole in the ground east of the

Rocky Mountains. The theory of their having been forced westwards by their enemies is confirmed to some degree by both Blackfoot and Algonkian legend. Still, there is conflicting local myth stating that the Kutenai, have been here ever since they “woke up” at their “Big Village” of Tobacco Plains astride the B.C./Montana border.

It is speculated that the Plains influence of Kutenai culture, particularly that of the Upper Kutenai, is merely a result of bison hunting expeditions, trade, and general venturing out into Plains territory. Regardless, evidence of human inhabitants can be traced back 14,000 years, the trail disappearing into the last Ice Age.

Another story from another source, “The Flathead and Kootenay,” by Olga Johnson, 1969, states that the Blackfeet began to push southwestwards around 1700 and the Plains buffalo-hunting Ktunaxa were in their way. Despite being described by white explorer A. Henry as being a “brave and warlike nation,” the Ktunaxa were being slaughtered and enslaved by the Blackfeet and also destroyed by a smallpox epidemic. Survivors supposedly scattered and went to live with other tribes west of the Rockies. According to narrative history, this may be the same epidemic that almost wiped out all of the Lower Kutenais. It is said that a band of people moved from their Bonner’s Ferry site up river towards Creston trying to escape a “measles epidemic.” Several generations later, following an all-tribe Sun Dance celebration held at Inneas Creek, a second epidemic hit, so hard in fact that the visitors from the Upper Columbia never reached home. The stricken band moved to “Belly Ache Creek” near Leonia, Idaho, hoping to leave the sickness behind. The deaths continued until only one woman and her grown daughter remained. “Singing Through” and “Traveling On” canoed their way down river encountering only corpses. They were apparently joined at Kootenay Lake by a man from Windermere, said to be the only Upper Kootenay survivor, who by marrying these women fathered all future Lower Kutenai people.

The Kutenais are said to be taller than other B.C. tribes. They painted the same realistic, Plains style motifs on their tents and clothing, made pottery, danced the Sun Dance and grew tobacco. These are all very indicative of a direct history with Plains culture.



LOCATION

The Kutenai or Ktunaxa inhabit the country included between the Rockies and the Selkirks, stretching from the 49th to 52nd parallel north latitude and watered by the Upper Kootenay and Upper Columbia rivers and their tributaries. The Interior Salish and the Okanagans in the east and the Shuswaps in the north met their territory. To the east lived the Rocky Mountain Stoneys, Blackfoot and Piegan. Their neighbors to the south included the Flatheads, Kalispels, Colvilles and Pend d’Oreilles. (The Kalispels also traveled in sturgeon-nosed canoes.) The Kutenais living on the Arrow Lakes intermarried with the Salish or Okanagans (Sinixt) in the region but eventually quarreled and agreed to keep to Kootenay Lake. Most of the Arrow Lakes descendants now live on the Colville Reservation in eastern Washington.

Charles Wilson of the British Boundary Commission spent the years of 1860-62 at Fort Colville and observed that the Europeans, having brought whiskey and civilization to the area, expected the native people to become a matter of history. This essentially means that the ethnographic information is inconclusive due to the fact that it was not seriously recorded until contact had completely altered traditional native patterns.



CHARACTERISTICS

The Kutenai in recorded history were certainly well liked by the Europeans who encountered them. They were described repeatedly as being easygoing, conscientious people, not preoccupied with war, rather reserved, “cautious, honest and sincere” (Carmichael, ’73). They were generally tall in stature, 5’8” being average, muscular and lithe. They had dark brown eyes and hair straight and black, though in some cases it was

brown and curly. Their skin tone varied some, although some observers considered the Kootenays to characteristically have lighter skin and less Asiatic features than other northwestern natives. Facial and body hair was uncommon as it was usually plucked at the roots. Kutenai males wore their hair in three braids, while the women wore two. They dressed rather plainly except during celebration or ceremony. A husband took pride in his wife's appearance, sometimes painting her face and hair part and setting aside his best prancing horse to parade her through the village on special occasions. Women had their own horses that they could sell or trade. In his book "The North American Indians" Curtis states that the "Kootenai physiognomy is far less heavy and gross than Plains type or the types of the surrounding Plateau area."



LANGUAGE

The Kutenai tongue was certainly distinct from that of any other North American tribe. Early white men who encountered them recognized their tongue's "musical quality"; fur trader Ross Cox described it as "infinitely softer and more free from those unpronounceable gutturals so common among lower tribes." Some peculiarities of morphology suggest comparison between Shoshonean (Nahuatl, or the language spoken by early Aztecs), Athapaskan or Sionan stocks. Edward Sapier, author of an Encyclopedia Britannica article on Indian languages, included Kutenai in the Algonkian-Wakashan stock, tentatively relating the Kutenai to the Blackfeet who were to become their enemies after the mountain tribes had horses.

The Kutenai tongue is devoid of "b," "v," "f" and "r" consonants and is rich in vowel variations. These people must have spent a long period of time unto themselves somewhere throughout their history, learning to communicate in their very own way. The Kutenai are proud of their unique language, so difficult for nonnatives to ever master completely. A notable feature of this interesting tongue is that subtleties of meaning are often conveyed by slight changes of vowel sound, inflection, tonal pitch or gesture. One very interesting



Postcard Reproduction. Kootenay area Indian in Sturgeon-nose canoe with fish. PHOTO COURTESY OF THE NELSON MUSEUM

but since dismissed theory is that the Kutenais were the long sought after “White” or “Welsh” Indians, descendants from a Welsh Prince. There is a legend of a Prince Madog or Modoc who, according to English adventurer Francis Loves, settled in Florida in the 12th century. There settlers supposedly became the ancestors of the Welsh Indians who then spread out over the continent. Several parties hunted this phantom race before Lewis and Clark, intrigued by the apparent Welsh elements in the speech of the Upper Kutenai people, wrongfully identified them as the Kalispels, though there is no evidence showing relation between them and the British Islanders. David Thompson was Welsh, and it is possible that he taught his guides and trappers the Welsh names for things, which then became integrated into their own tongue.



THE STURGEON-NOSED CANOE

These specially designed canoes with the ends flared at the bottom were used by the Kootenai and Salish tribal groups in the Columbia and Kootenay Lake area and also in northern Idaho and northeastern Washington. The canoes varied in length, the average being 17 feet. Battens, supported by the ribs, run from the snout or flare, carry on from the end of the passenger section and swoop down, forming a point. The flare protrudes under water. While being used, the craft has to carry ballast or freight; the extra weight forces the snout underwater, rendering the boat stable and easier to handle in turbulent waters. The bark used was taken from a young tree, either birch, spruce, fir, white pine or balsam, in spring so it would peel easily. It was specially prepared in a specific manner, although some of the other materials may have varied. Generally maple was used for the ribs and cedar for the battens. Sewing materials were derived from the outer covering of cedar roots. The ribbon-like binding was bark from a “wild cherry bush,” and Ponderosa pitch provided caulking for seams and knotholes. The canoe’s overall appearance would vary according to the craftsman or tribe.



Kootenay area Indians with dog in Sturgeon-nose canoe. PHOTO COURTESY OF THE NELSON MUSEUM

When the canoe was used for transport, it was extremely fast. The person paddling would kneel on a cedar mat, ankles crossed. The mat was used to prevent hull punctures. Round rocks were used as ballast. The canoes were also used in reed gathering, as the pointed ends made passage through the dense reeds easier. The reed seeds were pounded into flour, the bodies woven into baskets and such, and the root bulbs eaten like potatoes.



FOOD

Certainly the food specialty of the Plateau people was salmon. While the Kalispel and Spokane (a Salish word meaning “the Sun”) tribes to the south fished the lower Pend d’Oreille, moved east to the Bitterroot Range in Idaho, or traded with western tribes such as the Shoshones, the Kutenai-Ktunaxa had an ample supply of salmon because the spawning grounds were located at the head of the Columbia. The Ktunaxa, always a water people, traveled by canoe and procured the fish simply by spearing them. They employed various other methods as well, including dip-nets, weirs, wooden platforms extending over the water, dikes and basket traps, into which fish leaping up cascades fell back. Olga Johnson makes specific reference to the Kalispel (Salish term referring to neighboring tribes to the south) traveling to the “Salmon River” in British Columbia to find salmon. This, of course, is the present-day Salmo River.

After being caught, the fish were brought to the women, whose job it was to clean and prepare them. They would sun dry strips on pole-racks (as opposed to smoking them) in preparation for storage. The Northern Ktunaxa, those who live on the upper (eastern) stretches of the Kootenay River, certainly fished salmon and trout in any season, but in remembered history considered bison to be their staple. The Lower Ktunaxa depended heavily on fish for their survival, and while they caught bull trout and river sturgeon, they would often head towards Arrow Lakes or the Upper Columbia for the salmon harvest, or find that the lessened spring runoff would leave salmon stranded in pools, which they captured in large nets. Not only did they have plenty of fish, but they also had plenty of deer and, consequently, were very attuned to living a more village lifestyle.

Olga Johnson quotes one Peter Andrew (a Kutenai Indian) as saying that in the Upper Kutenai range “the caribou were thick in the old days. The people would save the caribou for hard times; buffalo were easier to hunt for they were in open country. There were hardly any whitetail deer in early times, but some blacktail (mule deer); there were goat, sheep and elk. My people used mountain goat skins for blankets, elk and buffalo hides for tipis and clothing.”

Contemporary native peoples say that an extreme winter during the fur trade years wiped out the last of the buffalo and “antelope” (David Thompson referred to the whitetail deer as antelope) in the interior valleys of the Kutenai country. The method of hunting entailed herding animals into narrow valleys between hills and mountains, sometimes erecting barricades, and then slaughtering them when they were trapped. The hunter, upon returning to camp, would pray to the animals’ spirits for taking their lives, as the creatures were considered fellow beings, respected and quite often feared. They believed that the animals’ spirits or souls were not destroyed, but hovered about watching to see that the bodies were treated respectfully and considerately. The hunters reportedly closed the eyes of the animal before butchering it. Sometimes when hunting prospects were rather poor, a shaman or medicine man would sing during the night while the people extinguished their fires. By morning, the shaman could see in the ashes the buffalo’s tracks and tell his people where to hunt. One account tells of hunters who, after fishing many salmon from the river, would gather in a dwelling and ceremoniously cook the fish using woven baskets containing hot rocks. The boiled fish was eaten with scrupulous care so as not to detach a single bone from the skeleton. This was a Salish ceremony, probably adopted from coastal tribes. They believed that, by putting an intact salmon carcass back into the water, it would return to the ocean and be reborn.

Both the Upper and Lower groups ate plentiful amounts of roots, mushrooms, lichens, mosses, plants and berries throughout the summer, drying and preparing them for winter consumption. They ate plenty of

Bitterroot, one of the first root vegetables ready in spring, by peeling back the outer skin and either eating it raw or boiling it until tender. Western Spring Beauty or Indian Potato is ready at the same time as the Bitterroot and has an edible root ball, about the size of a cherry, that can be eaten raw or cooked. Apparently, they are very tasty. Balsamroot or Spring Sunflower can be eaten in its entirety, though native peoples primarily ate the young inner stem or toasted the seeds with those of evergreen trees. They also ate gooseberries, serviceberries or saskatoon berries, strawberries, red and black raspberries, chokecherries, huckleberries, elderberries and the acrid buffalo berry. For winter use, they would dry the berries or pound them into cakes for drying and then store them, frequently in recognizable spots in the ground under trees, lining the holes with leaves or branches. These were for eating while hunting or travelling.

In the late summer, camps were moved to the mountain slopes and high benches for huckleberry picking. The native peoples competed with bears, considered to be the nearest animal to humans, for the crop. Relatives and friends from different bands would meet in the huckleberry patches; it was an opportunity to socialize, particularly for the young people, and was also considered a serious economic business. Berry picking was mainly a job for women and children, and regional legends are full of stories as to what happened to them while out in the field. Berries were stored separately in birch bags, baskets or boxes, or mixed and dried with pulverized meat into a type of pemmican. They were also served fresh on plates of bark, leaves or serving dishes woven from roots, bark or clay.

The Kutenai mainly boiled their meats and vegetables, as opposed to roasting them. They also preferred sun drying meat and fish instead of smoking them. They would season boiled dishes with herbs such as peppermint, tarragon and wild onion. Boiling methods frequently involved dropping hot stones into hollow wooden vessels, sewn bark or woven roots. Holes were dug in the ground and lined with rawhide and also employed hot stones to boil or steam the contents. The Lower Kutenai were particularly adept at making coiled baskets of split cedar roots so tightly fit together that they were entirely waterproof. They infrequently made vessels of sand tempered clay, crudely punching out a bowl shape in the center and then smoothing out the edges or fashioning flower-like bowls by pressing a clay mixture into bark molds. The pottery was sun dried and therefore only used to boil food, never over an open hearth. The Lower Kutenai were said never to use pottery, and that which was made by the upper tribes was plain and undecorated. It is said to resemble articles made long ago in Siberia.

Thanks was given to the sun at the time of the first Bitterroot harvest, and each year when berry season began, they would stage a Grizzly Bear Dance, secondary only to the Sun Dance. Inside a large dance tipi, an altar would be erected to honor the grizzly, adorned with a skull. The adults would sit around a fire facing the altar and the bear shaman, who would recite prayers and sing to the Bear Spirit, then pass around his rattle signaling the others to recite their own prayers or sing their own songs. Meanwhile, individuals would rise and dance within the circle, offering their pipes to the bear and thanking him for sharing the berry crop with them.

The Ktunaxa were always very generous with one another, never allowing families or individuals to go hungry, knowing the favour would be returned. The chiefs were often the most giving, having to set an example for the tribe. There was certainly respect for the “wealthy,” as wealth was only accumulated through hard work, bravery, cleverness, and by being in good favour with the spirits. Medicine bundles and animal medicine were considered as riches; given to a man by his guardian spirit, they would enable him to locate game, control weather patterns, ward off attack, and banish illness, should he faithfully perform his revealed rites.



HOME

The need for Kutenai and neighboring Salish tribes to follow the pattern of harvesting edibles gave rise to a centrally based wandering settlement society. The Interior Salish lived in semi-subterranean pit houses (shallow rounded pits with pole and mat coverings) during the salmon run as dwellings generally were used to

store extra resources. There are known sites along the Pend d'Oreille and along the river near Trail. Unfortunately, not much archaeological evidence can be gathered from these sites because, come early spring, they were cleaned and repaired for the following winter. The soil being acidic, few bone, wood or organic materials survived. However, pestles and mortars, arrowheads, net sinkers, hammers, chisels, knives, scrapers and hide pounders have been found by professionals and lucky amateurs as well.



THE SUN DANCE

Fortunately for participants, the Kutenai had a much more simplified version of this ritual than did their Plains neighbors. Some twenty Plains tribes underwent this excruciating ceremony, in which everyone took part. The staging of the Sun Dance was annual and took place in the Spring, but the exact date was reportedly revealed to the Sun Dance

Chief in a dream. Active communal rites began by falling a tree and erecting a maypole in the center of the Sun Dance Lodge, which was to become the focus of prayers, dancing and singing. The tree was appointed in the dream specifically for this purpose, the women hacking the trunk until it fell onto the shoulders of the men. According to Plains culture, the warriors or participants would pass bone skewers through the flesh beneath the skin and attach these with leather thongs to buffalo skulls or to the pole. They would then dance, dragging



Postcard Reproduction. Kootenay area Indian family standing in front of their tipi.

PHOTO COURTESY OF THE NELSON MUSEUM

the skulls or suspending themselves from the pole, most times tearing away from it, ripping skin and flesh. Those who gave up before freeing themselves via skin tearing were considered weak or in ill-favor with the spirits. Participants frequently lost consciousness from fasting beforehand, or from sheer pain and exhaustion.

The Kutenai version went without the self-torture. Sometimes a Sun Dance was held to give thanks or receive favours from the Sun, their primary deity, or in honour of the Sun Dance Chief's services to his people. The Chief would instruct his helpers on how to fashion a special Sun Dance Doll beforehand, then pray to it for weeks, readying himself to lead the seven day ceremony. Some accounts describe the doll as being in the form of a little boy about three feet tall. The head was to be well-defined so that the Sun Spirit would enter into it and stay until the worship was finished. The body was made simply of sticks tied together, and this effigy was crafted in secret, revealed only at the beginning of the Sun Dance. Another description of the doll depicts it as a six inch male figure fashioned of buckskin stuffed with grass or deer hair, wearing two eagle feathers in its hair.

Workers readied the maypole after a session in the sweat lodge by peeling it and painting it in alternating bands of color. Tribal members would hang gifts once it was erected; to some they were just symbolic offerings, to others they were valuable and later distributed amongst the needy. The frame consisted of a tripod, and coverings were donated by the tribal members. When the lodge was readied, the Sun Dance Doll was placed on an altar to one side, a fire was lit between the doll and the pole, another between the image and the lodge entrance, and the first day of dancing began. Under the direction of the Sun Dance Chief were two whistlers whose faces and bodies were painted according to traditional colors and beliefs. As part of the opening ceremonies, these celebrants, with their bone whistles, were to cling to a rope bar before the altar and dance for afternoon and night long sessions, while others joined them if and when they so desired. During the seven day ceremony, all the participating members were to abstain from sex and other so-called "frivolous" behaviour, the dancing subsiding only for a short time for rest and a bare minimum of activity. When the Sun Dance Doll was taken from the lodge to be disposed of in some secret location and the Sun Spirit had departed the image, complete with participants' prayers, only then did the celebratory feast and storytelling begin.

It is uncertain, though probable, that the Kutenai inherited the Sun Dance from the Plains cultures, or even those to the south who participated in similar ritual. It is even speculated that it is directly related to Mexican ceremonial rites.



MEN AND WOMEN

Apparently, a woman's work was never done, and according to pioneer reports was rather undervalued. Fur trader Alexander Ross said that the women of mountain tribes possessed little or no influence but seemed contented nonetheless. Chastity was certainly a virtue and marriage not a religious bond, though they were so encouraged to be faithful that most unions were permanent. Perhaps due to the fact that there were often more men in a tribe than women, polygamy was not uncommon. The Ktunaxa were known to take slaves who were frequently integrated by marriage.

A.F Chamberlain reported that adultery was not severely punished amongst the Kutenai (usually it meant having one braid cut off) though many a legend depicts jealous husbands or lovers killing or maiming one another for the love of the same woman.

The men's societies usually had their female counterparts. Women took part in scalp dances, and sometimes engaged alongside male warriors in battle. Long ago, Ktunaxa women had an organization of their own, the "Crazy Owl Society," formed supposedly to ward off epidemics. In this tribe, a woman, as well as a man, could sponsor a Sun Dance. Society amongst mountain and plateau peoples tended to be matrilinear; a man marrying into another group went to live with his wife's family.



COSMOLOGY/SPIRITUALITY

“Without Guardian Spirits an Indian is like a fish without fins. He cannot live very long, he is nothing but a fool. For it is through them that we really know the sun, the moon, the mountains, the dawn and the night; it is from them that we get the strength of earth, of all nature” (from “Indian Days in the Canadian Rockies,” Barbeau).

Essentially everything, according to Ktunaxa belief, had a spirit, from trees to rocks to every animate and inanimate object. These spirits could go anywhere, through any substance at all, and one touch of these “nipi’ka” could cause death or disease. The Kutenai and Flathead shared the belief that the shamans (a Mongolian term) or shamanesses were doctors, feature singers, dance leaders, spiritual specialists, seers, magicians, mind readers, hypnotists and prophets all combined. In 1807, one woman prophet was said to have traveled ahead of David Thompson as he worked his way down the Columbia to the coast, spreading major foreboding and warning that the end was near. Within fifty years, smallpox had ravaged the entire population.

Anyone could attain the position of shaman should he or she demonstrate superior influence with the spirits, prophesize accurately, supply effective cures to the tribe, or perform miraculous feats in battle or during the hunt. However, every individual band member had a little magic of his or her own, made obvious or available by dreams or visions brought about by an adolescent Spirit Quest. In camp, shamans had special lodges, bigger than the rest, where they invoked spirits with incantations, the spirits manifesting themselves as birds or other animals. Shamans healed sick patients by using pressure points or “blowing” on them, thereby extracting the malady or evil spirit. The shaman, or “ni’pik’ak a’k’a,” sometimes resorted to bloodletting at the wrist to heal ailing patients.

The dead were usually buried in shallow holes amidst rocks and boulders, or left in shallow indentations below sloughs with the expectancy of being buried by falling rock or debris. Sometimes they were buried at the high water mark in stream channels or even left exposed to the air and elements. Chamberlain’s account states that in the early days the deceased was buried with all his finery and there was a funeral procession, and that before the church disallowed it, the mourners would shriek terribly over the loss of a loved one. They took good care of their dead and would never disturb a burial site.

Shamans were very much revered amongst the tribe, and reverence was often payment enough for services rendered. Seldom were they discredited, but if the tribe had a succession of bad luck, then the shaman was deemed ineffective and would lose his position, sometimes even his life.



Editors note:

There remains confusion and contention over First Nations influence in our watershed. To our knowledge there exists no settlement sites here. There is also very little direct information relating to our watershed. It is very possible the flavour of this First Nations chapter, would have been changed had the author had the opportunity to read *‘Keeping the Lakes’ Way’ Reburial and the Re-creation of a Moral World among an Invisible People* by Paula Pryce. University of Toronto Press. 1999. This book speaks directly to the influence to the ‘Lakes’ or Sinixt Indians in this region.

SALMON FISHING IN THE LOWER PEND D'OREILLE RIVER

The Kalispel tribe residing in the region around Usk, WA made annual fishing trips below Big Eddy Canyon cascade for the specific purpose of catching salmon. This location was a part of their traditional territory. Teit (1930) states,

“In the salmon season, some Kalispel went down the river to near the Box [Big Eddy] Canyon, then across country to the head of the Salmo River in British Columbia, which was the northeast corner of their tribal territory, and there fished salmon.”

Walker (1977) reported that “the Kalispels often travelled into neighbouring British Columbia to fish [for salmon]. They also fished and traded with the Spokane and other Interior Salish Tribes to the West at Kettle Falls and Spokane Falls.” Smith (1983) records that the Kalispel caught fish in a trough-shaped basket at the Falls on the Pend d'Oreille River just above the mouth of the Salmo River. He stated in a sworn deposition in 1983 “The trip was made twice a year. All of the able bodied men, numbering 200 to 300 would make both trips.” The amount of salmon taken was the equivalent to what these fishermen ate plus what they could carry back to their canoes above the Cascade (approximately 75 lbs. dried salmon). Given a multiplication factor of 1.5 to convert dry salmon to fresh salmon, the total catch was approximately 56,250 lbs. of fresh salmon per year (ie. the product of 250 men (average) x 75 lbs. dried salmon x 1.5 conversion factor x 2 trips/year.) Additionally, the average fishermen might consume 3 lbs of fresh salmon per day for the seven to fourteen day duration of the trip for a total of 15,000 lbs. (ie. the product of 3 lbs. salmon x 250 individuals x 10 days average trip duration x 2 trips/year). The total annual consumption of salmon by the Kalispel Tribe would be a minimum of 71,250 lbs. (3,851 fish at 18.5 lb fish) of salmon from their territory on the Lower Pend d'Oreille plus whatever salmon they could catch in other portions of their territory, for example, at Albeni Falls.

In addition to salmon in their territory, the Kalispel joined other tribes at Kettle Falls and on the Spokane and Little Spokane Rivers.

Upper Columbia United Tribes
Coeur d'Alene, Kalispel, Kootenai, Spokane

Fisheries Technical Report No. 2 — December 1985

Compilation of information on Salmon and Steelhead total run size, catch and hydropower related losses in the upper Columbia River basin, above Grand Coulee Dam.

This page added by the Editor.

STORIES
FROM OUR ELDERS

PREPARED BY:

Chris Atha

Salmo Watershed Assessment Youth Team



Bill Gray, fish catch from the Salmon River (Salmo) — 1914.

PHOTO COURTESY OF THE SALMO MUSEUM



Suddenly a blast of cold fresh air entered the lodge. In his dissipating reverie the young prophet became aware of the others beginning to stir around him. He was equally unclear as to how long he had been dreaming and to what these strange visions might mean. He would have to speak with his Father, Chief Enneas after the celebration.

Filled with a sense of wisdom he thanked the Great Spirit for bestowing upon him such a gift and bracing himself he ran naked and steaming into the snow.

The celebration had begun. In the warmth of the fire, families and friends shared laughter and each told their visions of the future.





Main Street Salmo, British Columbia – Royal Bank of Canada is to the left of the Northern Hotel. PHOTO COURTESY OF BERNARINE STEDILE

ART SIMMONS

Duration in Salmo: 47 years

Occupation: Logger/Highways

Art Simmons moved here in 1952. He used to drive logging trucks for Rotter Logging and Hearn Logging (a.k.a. L.P. and Idaho Inc.). During his employment driving logging trucks, he most often hauled out of the Pend d’Orielle and Rosebud Lake areas. He told me about one old logging road up near the old Nugget Mine. The road was only wide enough for the truck. Before proceeding up or down the road, the mirrors on the truck had to be pulled in or else they would be ripped off. While driving up the road, he was able to reach his arm out the window, within three feet, and touch the rock face the road was carved out of. When he looked out his window on the way down, there was nothing to be seen except a large drop-off within a foot of his side of the truck.

Although Art wasn’t much of a fisherman, he does remember that there was a high fish population in most of the streams in the area during the 1950’s and 1960’s. He remembers when Frank and Bob Rotter would dredge the Salmo River every so often, leaving a clear tack for all the fish to swim. Some of the fish were upwards of three to four feet long, and there was far from a shortage of them.

In 1973, Art quit driving the logging trucks and began his career with Highways. He was involved in the building or upgrading of a large number of the roads we still use today, for example, the road up Lost Creek and a few other minor roads up various other creeks, the highways to Nelson and Trail, and part of the Salmo/Creston. The highway to Nelson wasn’t much more than a poorly conditioned dirt road. The road was so bad in some places that a few people decided to drive on the tracks (prior to the 1950’s).

While working for highways trying to create new roads or just fix the existing ones, Art and his crew always had a problem with the beavers. The beavers would dam up the creeks and flood out the area in which they were attempting to install the road. The crew was continually breaking up dams and trying to rid their workplace of the beavers. Finally one day, Art came up with a foolproof plan. He decided to take a culvert, slice it down one side, then form it into a conical shape with a hole large enough for water to pass through at the smaller end. From there, he spanned his invention across the stream or creek and waited. The beavers came

back to rebuild their dams but were very confused as to how they would dam the water coming out of the small hole in the end. This method confused them for a while, but they then figured out that all they had to do was dam up the inside so the water couldn't make it to the hole in the end. Art was getting a little flustered because they couldn't discourage the beavers enough to make them find new homes, so he changed his design. Instead of having only one hole in the end, he decided to put eight or ten. The beavers came back and stuck twigs and leaves inside to block the hole, but it didn't work because the water was still coming out of six to eight other holes. After the beavers tired of being unsuccessful at plugging all the holes, they finally decided to find new homes where they wouldn't be bothered.

Another aspect of Art's Highways experience was travelling up existing roads to assess whether or not they should continue any further than they already did. On a trip up along Sheep Creek, back when some of the mines were still active, there were quite a few townsites at various miles along the road. One of those townsites was called Queens. There was a Post Office, cornerstore/supermarket, and a Blueline Freight. The supermarket and Post Office were built directly over the creek. The supermarket used this location to its own advantage. They made cages, filled them with meat and then lowered them into the creek to keep the meat cool and a little bit fresher.

There is one place that especially sticks out in Art's mind. That place is Panther Lake. He and his wife, Ruth, used to go there to enjoy each other's company. They would sit in perfect tranquility for hours. The only noise ever heard there was the odd cricket, small bird, or a fish surfacing. Now doesn't that sound romantic?



EMILY DODDS

Age: 92

Duration in Salmo: 54 years

Occupation: Housewife to miner

When Emily Dodds moved to Salmo, there was 569 people living in the area. She moved here from Erickson on March 7, 1945. In 1951, she moved into her present home, which is located beside the Post Office. If travel was a necessity, Emily would have to rely on the buses or a ferry, depending on where she had to go. The roads were in such poor shape that people were better off having someone else drive for them as opposed to dealing with those poor conditions themselves. Some of Emily's activities at this time were curling and bridge. Both of these activities were very popular in Salmo during the late 1940's and early 1950's. One of her favourite hobbies was picking and canning huckleberries. I tried to find out whereabouts she used to pick them, but she wasn't willing to divulge that information to me. I don't really blame her either; if I knew where a good place to pick huckleberries was, I wouldn't tell anybody either.

During the late 1940's and 1950's, there was no Police Station in Salmo. The British Columbia Police would patrol the area once in a while, but most often would only visit the area if there was an actual reason to. Where the Coyote Cafe is presently located, there used to be a drugstore. There was also a one-room schoolhouse, with approximately 50 children, where Shop Easy is today. The first Pentecostal pastor came to Salmo in 1948, where he founded Hillcrest Pentecostal Church. His name was Ross Penoyer. Both the United and Anglican churches had already been established by this time.

Emily's husband, Jim Dodds, was a miner. Jim never really talked about work with Emily. He did talk about a couple of his hobbies though, fishing and hunting. When it came to fishing, Jim enjoyed spending time on Wulf Lake, Panther Lake, the Salmo River, and a couple of other premium spots. Emily wasn't able to elaborate on the kinds of fish that Jim would catch, but she was very sure that the fish were plentiful. Hunting wasn't a huge hobby of Jim's, but there was a little information given concerning population. The elk began showing up about 20 years ago, along with an increase in the moose population. Jim also owned a fencepost company with his brother.

HENRY STAVAST

Duration in Salmo: 20 years

Occupation: Dairy Farmer/Garbage man/Bottle Depot Operator

Henry moved into the Ross Spur area on October 10, 1938. He ran a dairy farm, originally the Barkley Farm, with roughly 70 head. His farm was next to Jake Hiemstra's farm. Jake Hiemstra ended up marrying Henry's relative, Yanke Stavast. Henry sold his farm in 1979. From there he moved to Gibbon Road here in Salmo. When he got to Salmo, he opened up a bottle depot on his property and started his employment as a garbage man. He described to me that the old dump used to be a quarter of the way up the Skihill Road (by Bernie Endersby's property), later it was out by Porcupine Mill behind where the red barn is today. From there it was moved to its present location just off of Airport Road. Henry wasn't much of a fisherman, but a few of his friends and relatives used to catch salmon out of, at that time, the Salmon River. They used to catch a lot of them where the Legion is now. In 1957, an Oriental man owned a cafe where Charlies is now. I'm not sure how long it ran for, but it seemed to be a popular coffee spot at the time. In the early 1980's, Erie Creek was re-dyked all the way from Henry's into town.

One specific sentence Henry said before the interview came to a close was, "Just the way bubbles burst, nothing last, nothing first." I'm not exactly sure what it means or what it was directed towards, but it stuck into my head and I'll decipher the meaning one day.



JOE HUSER

Age: 79

Duration in Salmo: 51 years

Occupation: Miner

Joe Huser moved here in 1948. He came for the mining, Emerald Mine especially. He also mined Enterprise Mine. Inside the mine, there were ten diesel trucks working underground, along with a forty-ton, one load Caterpillar. The removal of tailings was sent through a maze of chutes and conveyors. The conveyors were run electrically; the power came from The West Kooteney Power Company. Joe spent a few years prospecting different areas up Sheep Creek, Erie Creek, and a few others. To this day, Joe believes there is cyanide along the river bottom in some areas. This could be one of the reasons that the fish populations are down. After his mining days, he began making fenceposts and then went on to construct radio towers for BC Tel.

In the 1970's, when the river flooded, the high water washed out the bridge Frank Rotter had built. At the same time the water washed out the bridge, it also changed course. That in turn created more habitat for fish. Wulf and Panther Lakes were great fishing in 1952. There were a lot of big and fat fish, like cutty. Fifteen to twenty years ago, there were a lot more insects around the water and also bigger fish. The fish were very active, continually jumping wholly out of the water to catch the abundance of insects hovering over the water. When the levels of air pollution increased, the populations of insects and various other wildlife declined. Some other points Joe brought to our attention (reasons for the lower fish populations), include the rivers being channelized, nonmining pollutants, mining pollutants, and the development around the river which increased the flow speed of the river. Fish were unable to continue spawning because the river would wash away the eggs. The fry didn't have a chance to establish a habitat, so all new fish growth was washed out.

Around the thick spruce forests in the south and around a lot of lakes, rivers, and streams, the natives used to hunt the wildlife using square pits placed strategically beside the water. The wildlife would attempt to get a drink, but instead of quenching their thirst, they would be quenching the hunter's appetite.



Early view of Ymir, British Columbia. PHOTO COURTESY OF BERNARINE STEDILE

DAVE BUSH

Duration in Salmo: Life

Occupation: Miner/trapper/fisherman

Dave was born in Salmo. Dave's main interest was fishing and then in turn came mining and trapping. Dave grew up on the Salmo River and surrounding creeks. He used to catch two to five pound trout in Erie Creek, and upwards of seven pound bull trout in big pools by Hidden Creek. In 1969 or 1970, the government dyked the Salmo River from Salmo to the rest site by the highway. Dave told us about a good fishing hole on Shingle Mill Flats by Swift Creek. Unfortunately, as of 1996, it no longer serves its purpose of a good fishing hole. A little information about the forests of the area: there were a large number of cedar trees roughly five feet wide. There were other trees that came close to that size as well, but logging took care of most of them.

When it came to trapping, Dave trapped a diverse number of animals, for example, marten, lynx, coyote, beaver, and otter. The majority of trapping was done prior to the war, and its popularity has diminished after that. Most people used rifles or bows. Other wildlife in the area were the caribou. They had a high population in the 1950's and 1960's. An excellent spot to locate them was by Elmo Lake. During the early 1900's, there were wild horses roaming the terrain. Throughout the 1920's and 1930's, people were legally allowed to hunt them. In the the early 1960's, there was a forest fire at Caribou (Archibald) Lake. That's when the wild horses were no longer seen — 1962 to be exact. At the same time, the moose population was increasing, along with the grizzly bear population.

Mining is a big part of Salmo and area's history. Almost every man that has been here for more than fifty years has mined or was involved in mining one way or another. In 1850, gold was found in the Pend d'Oreille area, in 1870 gold was found up Erie Creek, and in 1870 to 1880, Ymir and Quartz Creek had gold turning up. The old Rotter mill and ranch had land disputes with the government. The Emerald Mine had some involvement in the disputes as well. The biggest gold nugget, in Dave's recollection, was one pound troy. Troy is an exact measurement of a pound, as not to upset the miners when cashing in their goods. There are also troy ounces.

When the water rose, it washed out a lot of the land in its way, in turn altering the course of the Salmo River. Dave remembers fishing right from the tracks, which can no longer be done due to the fact that there are no more tracks (they were removed about twenty years ago) and the river has changed course. The gold mines of the 1930's wiped out most of the fish population in Erie Creek by means of cyanide leeching into the water. In the 1970's, temperatures began to alter. It was hotter in the summers and there was more snow in the winters.

Most of the Japanese camps took place in the 1930's. They all came to work in the shingle and saw mills. The Japanese were corralled on what is now known as Jap Mountain, as well as in the Jap Flats (a.k.a. Burnt Flats). Before the Japanese came, the natives had left the area. There were too many white men coming in and overtaking the property. The natives halted all fishing and trapping in this area.



Early view of Erie, British Columbia — circa 1900. PHOTO COURTESY OF BERNARINE STEDILE

SCOTTIE McCLOUD

Age: 81

Duration in Salmo: 51 years

Occupation: Fire Warden/miner

Scottie moved here in 1948. Scottie helped construct almost every dam in the Columbia Basin. He also worked for Cominco. Throughout his employment with Cominco and his dam building, he was the Fire Warden for our district. He had keen interests in forestry, fishing, and hunting.

Scottie's recollections of the fishing around Salmo are similar to most of the other responses we've received. There was always an abundance of fish, especially bull trout. The decrease in population was caused by the river channelization and pollution (cyanide from the tailings and salt from the highways). The spawning areas were moving too fast, and fry development couldn't occur. Back eddies would happen every time high water came around. They would flood out peoples' yards along the river. When the water went down, some fish were unable to make it back to the river, so they were trapped in the small, diminishing pools.

There used to be a lot more hunting here. Now there aren't as many ungulates (elk, deer, moose, and caribou), so the levels of hunting have decreased. Elk were introduced in the late 1950's and appeared to be tame. One method to hunt them was to chase them with a snowmobile or quad to wear them out. When the logging began taking large chunks of our forests, the ungulates had less cover to hide in. It also affected the releasing of water into the river. Hunting the mountain sheep and goats hasn't been mentioned, but Scottie remembers feeding the mountain sheep along the Salmo-Creston pass.

Scottie wasn't involved with the construction of the highways themselves. He was involved in the construction of the highway maintenance sheds and buildings and also of some schools. As I mentioned earlier, Scottie helped construct almost every dam in the Columbia Basin.

JOE WRANGLER

Born: 1919

Interview out of: A Life in the Woods, Vol.2

Kootenay Museum Assoc. & Historical Society, Nelson, BC

“The first time I went up Trout Lake I went up with a contractor. We were building road for Sheep Creek Gold Mines which started off at Mile 31, before you get to Gerrard, east across the river. And that was seventeen miles at the time, that’s how far we went with the road.”...“Talk about a wild piece of road. See the railroad grade was out.” (With the railway grade being out, all traffic had to come through on the water. There were barges that brought in supplies, people, vehicles, and other assorted cargo.) “The road wasn’t like it is now. It was just narrow, and wet, muddy. It took ever so long to get up that 31 miles. It took about 3 hours sometimes. And if you had a flat tire, what are you going to do? You had to fix it there.”

“And we weren’t the only ones. People owned claims way back up there, 17 miles. All they wanted was a road so that they could get the 6x6’s up with the diamond drill. Exploration work. Dr. Pennell was the man that was in charge at the time, and I remember this was late October. We were up about thirteen miles and Dr. Pennell had walked up in the morning. We were living in just a fly camp, on skids and a tent over it, with three-foot sides, you know, and it came down and it started to snow. And he said to me, he says, ‘You know,’ he says, ‘I think we just about got it, in a day or so.’ And he told me he went up there before it started to snow, and he tried to find this one portal, and he says, ‘The glacier’s over it,’ he says. He couldn’t find it. He says, years ago, he says, about three years ago he was up there, he says, ‘I could find it.’ And he says, ‘This year I can’t because the glacier’s over it,’ and he says he cannot. Well, by the time we got the road in, that was the next year, well it had receded and then they found it, and then there was all these other claims that were down over the hill.”

“Boy they had a time, I’ll tell you. Okay, the finding, let’s face it, wasn’t good enough to put more money and really bring a volume out. The transportation costs from there at the time, the condition of the road, the short season, you know all this combined. So it just kind of was left. There was other people that were kind of interested, and then it just kind of deteriorated.” ... “I think it was about ’50 or ’51. Somewhere in there.”



HAZEL BEST

Age: 73

Duration in Salmo: 69 years

Occupation: Housewife/berrypicker

Hazel Best moved here in 1930. Hazel’s husband, Delbert, was a heavy-duty mechanic and also drove some heavy equipment for Rotter Logging. She was part of the third Doukhobor family to settle in Salmo. The Doukhobors were looked upon oddly because they had to go to work directly after school. In doing so they had no time for playing with their friends.

Hazel had some information for us concerning mining. She told us about the Yankee Girl opening in the early 1930’s, when she was about nine. The water was opaque due the extensive digging and tailings. A small boy died around Boulder Creek, and the body was very hard to find due to the turbidity of the water.

Hazel and her husband never opened or owned any stores or businesses, but she mentioned that in the old L.D. Cafe (the stucco building by the building supply) there was something called “Jocko the Monkey,” which was a front for bootlegging alcohol.

When the river flooded every year, Hazel would play in the back eddies. The major flood happened in 1948. She also mentioned that the sewage from the Hotel would drain into the Salmo River. Gross, if you ask me.



Halfway House at Sheep Creek. PHOTO COURTESY OF BERNARINE STEDILE

EMMA KONKIN

Age: 75

Duration in Salmo: 62 years

Occupation:

Emma Konkin moved here in 1937. Emma's father was the first Doukhobor on her end of town. She enjoyed fishing quite a bit. She didn't brag about how good she was, but did have a story for us. She and her sister went fishing a long time ago and caught a 14-inch pink fish. We aren't quite sure what type of fish it was, but it sure does fit the description of a salmon. In the late 1930's - 1940's and into the 1950's, there was no such thing as a bad fishing hole. Anyone was able to catch a fish anywhere they plunked their rod in. Most of the fish were trout of different sorts. There were rainbow trout, cutthroat trout and bull trout. There were probably a bunch of different bass, but we weren't able to get that information. As I said the fishing was great, but that only lasted a little shy of two decades from the time Emma got here. When all the mines began to boom, the pollutants that were escaping into the water began depleting the populations of fish in the streams and rivers. There was also an increase in the number of people that started taking up fishing as a hobby or as a way to put food on the table, and with that number increasing, the fish population was decreasing.

Sheep Creek was the source of a very large number of separate mines. Four of the mines that Emma could think of off the top of her head were the Reno Mine, Kootenay Mine, Gold Bill Mine, and the Sheep Creek Mine. The mines employed almost every man in the area at the time. They also had work camps for the men and their families.

There was a man named Mr. Pickter, Emma's grandfather, who used to work for Rotter Logging. Mr. Pickter would stay in the woods for three months at a time to log the designated areas. Then he would come out for as long a break as Rotter would allow; then it was back into the woods for the same old, same old. Rotter employed approximately three-quarters of the men in the Salmo/Ymir area. This was after a bunch of the mines had shut down in the 1950' and 1960's.

Emma gave us some information on the difference in climate between now and then. The winters were harsher, and the summers were hotter. She recalled one winter in 1946 when they had to shut down the railroad system due to the amounts of snow on the tracks. They just couldn't plow it quick enough or far enough for the trains to run. In the summers, it was so hot, people were growing cantelope and watermelons in their yards.

A little bit about agriculture now. Almost all cream and dairy products were sent to Nelson to be sold. There were quite a few cattle in and about this area. Most of the vegetables were sold up Sheep Creek at different townsites and camps for the miners and their families.



BARNEY ROSS

Age: 74

Duration in Salmo: 57 years

Occupation: Sawmill worker/miner

Barry moved here in 1942. He got involved in some of the mining in the area when he got here. He gave us a slight rundown on what some of the mines were digging for. Remac was a lead and zinc mine. All the tailings from that mine went straight into the river. The Canex and Emerald Mines started up in 1942 or 1943. They were mining tungsten, lead, and zinc. Eventually the tungsten mining operation closed down, so they were only mining the lead and zinc from there. The tungsten, which was used as a metal hardening matter, was in large demand before and during the war. They used to be able to get tungsten from South Africa, but for some reason or another, they were no longer to import it from there. Cominco was growing little by little at the time. One of their mines left a large tailings pile over by Kootenay Stoneworks, right beside the road.

The Seven Mile Dam was built in 1978. That dam had a large impact on the water level. The Waneta Dam was built during the 1950's. The construction of the Waneta Dam generated a lot of employment at the time.



THE DEWDNEY TRAIL

PREPARED BY:

Kurtis Black

Salmo Watershed Assessment Youth Team



Middle Jerald (Old Jerry) O'Donnell and dog Tige,
Right Jake Stertian. PHOTO COURTESY OF BERNARINE STEDILE



BORN IN 1835, IN DEVONSHIRE, ENGLAND, EDGAR DEWDNEY WAS A CIVIL ENGINEER.

He came to Canada in 1858 when he heard of the rich gold deposits in British Columbia. Travelling across the Pacific Ocean, and through the Panama Canal, he finally disembarked in Victoria on May 13, 1859.

Upon arrival in Victoria, Dewdney obtained an interview with Governor James Douglas in an attempt to find employment. The Governor suggested to Dewdney that Colonel Moody might be able to use him and that the Colonel was leaving for the mainland soon.

Over the next few months, Dewdney helped clear and survey the site for New Westminster. Afterwards, Dewdney left government service to grow hay for use as fodder for pack animals being used for road construction. It didn't take long for Dewdney to decide that he should stick to what he knew.

In 1860, Dewdney returned to the site of New Westminster, where he helped to erect the buildings of the future town. He also helped to auction off surveyed lots that were available to the public.

At the request of Governor Douglas, Dewdney joined Walter Moberly in order to build the trail surveyed by the Royal Engineers, which ran from Hope to the Similkameen. The trail was to be four feet wide, with a rise of no more than one foot per 12 feet run, so that it could be used for pack trains. In reality, the trail was not solid enough for man or beast outside the center two feet. When it was possible, rivers and streams were forded, to save money on bridge construction.

By the end of 1860, the trail had been completed from Hope, as far as Princeton. In 1861, Dewdney and Moberly continued the trail from Princeton to Rock Creek, in order to allow travel to the new mines developed there. By year's end, 1861, the trail was complete. At this time, however, the trail's end was Rock Creek; it was not extended all the way to Wild Horse Creek for several more years.

The trail saw heavy use, even before its entire length had been completed, and the Royal Engineers began an attempt to widen the trail into a road. The revenue to pay for the widening and improving of the quality of the trail was to come from increasing the tolls on the trail. The increased tolls discouraged people from using the trail, and they resumed using the old trails, which lead south. Because this defeated the purpose of the trail, the conversion was abandoned before it had gone 25 miles.

The original plan was for the trail to be an all Canadian route; however, according to Frank Fleming's narration in the 1963 film, *The Old Dewdney Trail*, "Old maps clearly show the Dewdney Trail - supposedly an all-Canadian route - crossing into the United States on the way to Osoyoos. Yet, written accounts say the trail went through Richter Pass, which would keep it in Canada."

The reasoning behind this is simple, actually. Originally, the trail did run south of the border for a brief span near Oroville. After a group of Chinese miners were robbed on the American span of the trail, that section was decommissioned, and a new section of trail was blazed, north of the border, in Richter Pass.

Dewdney was approached in 1865 regarding creation of a trail to the Kootenays. Dewdney requested assistance from two competent men and authority to hire workers as needed. He received formal project approval on April 12, 1865. His goal was to explore Osoyoos to Wild Horse Creek, decide upon the best route for a mule road, and to begin construction immediately. Turner and Howell were to assist.

Dewdney left Hope for Osoyoos at the end of April. He conferred with Angus McDonald about the location of the proposed trail in Colville. He once again left Osoyoos to begin exploring route possibilities on May 13. He followed Boundary Creek to the Columbia River. After traveling down the Columbia to Fort Shepherd, he went up the Kootenay River to Kootenay Lake. He had hoped to continue the trail directly across the Lake, but rugged terrain prevented this.

Local natives had informed him of a passable route to the north, leading to the headwaters of the Columbia, starting twenty miles up a creek at the north end of the lake. This route was not used, due to the lengthy detour to the north.

The search for an easterly route thus moved to the south end of the lake. Turner set out to blaze the

most direct route to the Columbia, using a route that the Hudson's Bay Company had done some work on the previous year. The rest of the group continued east and when they reached the Walla Walla Trail, followed it to Wild Horse Creek. They arrived on June 13, 1865.

After much consideration, Dewdney chose the route he was to take. They were to follow the "present line" as far as Boundary Creek. From there, the route would mainly follow McKay's route to the Columbia. From Fort Shepherd to Kootenay Lake, they would use a trail created, but not well used, by the Hudson's Bay Company.

The trail followed the Pend d'Oreille River up the Salmo from Fort Shepherd to the confluence of the South Salmo River. Contrary to some stories, the trail did not go up the present Salmo-Creston Highway. It followed this highway for about 7-1/2 km, then followed Lost Creek to the summit. The crossing south of the Kootenay Lake was difficult to choose, because the best crossing was south of the border. From Kootenay Lake, the trail would follow Goat Creek, and then cut across to the Moyie River where it joined the Walla Walla Trail to Wild Horse Creek. There was some objection to how close the trail went to the U.S. border.

Shortly after Dewdney arrived in Wild Horse Creek, he began work on the trail. William Fernie, in charge of a crew of sixty five, began working on the trail from the Wild Horse end. Dewdney proceeded to Fort Shepherd.

The trail was built in three phases. The first was blazing, planning and marking the route of the trail. After this the choppers went to work, clearing the marked path. Then came the graders, improving and leveling the trail. The trail was completed and seeing use in September of 1865.

In 1866, Dewdney worked on another trail, running up Bridge River from Lillooet, and constructed a road from Savona, on the Thompson River, to Cache Creek, on the Bonaparte River, a tributary of the Thompson River.

From 1869 throughout the 1870's, Dewdney became a more active politician, holding positions on the Legislative Council of B.C. and in the House of Commons, as a Conservative, where he served as the Indian commissioner responsible for overseeing the implementation of treaties with native peoples, as lieutenant-governor of both the North-West Territories and of British Columbia, and as Minister of the Interior.

Edgar Dewdney retired in 1897. He passed away in 1916. It is unknown at this time if the Dewdney Trail will be restored as a part of the Cross Canada Trail.



THE TRAIL TODAY

With the help of two local naturalists, we were able to visit an original section of the Dewdney Trail. Although much of the trail that passes between Fort Shepherd and Salmo lies on private land, the section near the Pend d'Oreille that we visited lies on Crown land.

Unfortunately, a century of disuse and overgrowth has left this section of the trail, and much of the route to Fort Shepherd, in a poor state. In places, the highway and railroads have been laid atop the trail, and elsewhere gas pipelines and BC hydro electric towers have obliterated it.



A MINING HISTORY
OF THE SALMO RIVER
WATERSHED

PREPARED BY:

Mike van Wijk

Salmo Watershed Assessment Youth Team



Ed Emilson and Harry Stevens, hand drilling — 1920's.

PHOTO COURTESY OF THE SALMO MUSEUM



During the sweat a young hunter experienced a prophetic vision. His small band fished and lived very near the Salmon River, a peaceful waterway located in a lovely, pristine valley.

He dreamt that the fish deliverately leapt from the water and lay gasping for air as the river turned a milky white.

It wouldn't be long before the mining boom that is responsible for all small towns here in the West Kootenay.





TO UNDERSTAND THE CURRENT CONDITION OF THE SALMO RIVER WATERSHED FROM AN ECOLOGICAL, economic, and social perspective, it is necessary to gain some understanding of the history of mining in the area because it was the driving force behind the European settlement of our drainage.

Following the first discovery of mainland gold in B.C. at the mouth of the Pend d'Oreille River in 1854, placer miners, many of them Chinese in origin, started to ascend the various drainages in the area in search of mineral wealth. According to the Department of Mine's Memoir 172 (pg. 21), the first placer mining in the Salmo River drainage was done by men from the Hudson's Bay Company who searched for minerals at the confluence of the Salmo and Pend d'Oreille Rivers in 1865.

The Chinese are said to have been throughout much of western Canada for some time prior to the period of gold exploration in the Kootenays. They are documented in Minister of Mines reports as a distinct group, and indeed they were treated as such, their wages being somewhat less than those of white miners.

The Salmo River, Erie Creek, Hall Creek, Sheep Creek, Wildhorse Creek and Quartz Creek were all exploited throughout the 1860's. Unfortunately, no records of placer production were kept until 1885, by which time much of the gold had been removed, causing placer mining to become almost strictly a hobby activity. To this day, however, it is not uncommon to come across old trenches in the woods that were once used to channel water for placer mining.

Of far larger consequence than placer mining has been hard rock mining. The initiation of this mining in the Nelson District, which includes Salmo and Ymir, is generally credited to the Hall brothers from

Colville, Washington. According to local historian Bill Barlee, their involvement in the region started in 1886, when the initial construction of the railways through the northern states had been finished. The completion caused a collapse in the Colville region's economy, which had grown dependent on the rail construction, both for direct and indirect employment. The depression hit the Colville Indian Reservation particularly hard.

Two brothers, Winslow and Osmar Hall, both of whom were married to native wives and had large families, felt that they were left with no option but to travel north in search of mineral wealth. Although neither was a prospector, they collected six of their sons, three of their cousins, two full-blooded Indian hunters, and several horses, and started travelling north. They entered Canada at the confluence of the Pend d'Oreille and the Columbia rivers. From there, they ascended the Pend d'Oreille until they reached the Salmon River (now the Salmo), at which point they turned north. They traveled up the Salmon to what is now Hall Creek, which they turned up and followed to its headwaters. By that time it was late October, and the group was running low on supplies. With winter fast approaching, the two brothers decided to send out a hunting party from their camp on the backside of Toad Mountain to gather food for the return trip to Colville. Unfortunately, they discovered that they had lost their horses, and had to go in search of them instead. By coincidence, when they rounded up the lost animals and



Gin pole: Ed Lundstrom placer claim at 15 mile on the Pend d'Oreille — circa 1920 to late 1940's.

PHOTO COURTESY OF BERNARINE STEDILE

gathered under a ledge of the mountain for shelter from the elements, they found some samples of what they thought was copper ore, but was really what turned out to be incredibly rich silver and gold ore. There is some dispute as to how exactly they noticed the ore, but according to Mr. Barlee, a toad was seen hopping towards its hole when it paused on a rock, drawing the party's attention to it. That rock was the one in which they found the ore. Almost as



Ed Lundstrom flume's: water for gravel washing. PHOTO COURTESY OF BERNARINE STEDILE

an afterthought, the brothers packed along several hundred pounds of the ore on their return trip to Colville, where they sought out an assayer to assess the ore's value. The assayer, whose name was Jake Colbath, was the only assayer in the area, and upon finding the ore to be of great value, he worked his way into Hall brothers' group, along with a former Hudson's Bay employee by the name of John MacDonald. Around the same time, the two native hunters were bought out of the team with one-time payments of \$250 each.

In the summer of 1887, the brothers once again turned north, this time with half the male population of Colville in pursuit, to work their Toad Mountain claim. They succeeded in shaking off their followers enroute by taking a roundabout route to the claim, travelling around the north end of Kootenay Lake and down the West Arm. The mine that they proceeded to develop, the Silver King, was the one that essentially started Nelson. After working around the mine for a few years, the Halls were bought out for at least a million dollars cash, which they spent in relatively short order by the end of the 1890's. They were then forced to return to placer mining to eke out a living.

It is interesting to note that, although the first major ore discovery near the Salmo River drainage occurred in late 1886 and the Nelson-Fort Sheppard railroad was built through Salmo in 1893, it wasn't until 1895 that the first mines in the drainage were actually staked. This is generally attributed to the tremendous prominence of the Rossland mining camp. In time, however, prospectors did overflow from Rossland to Salmo.

PHOTO COURTESY OF BERNARINE STEDILE



The first two mines to be staked in the Salmo drainage were the Ymir, by Jerome and Joseph Pitre and Oliver Blair, and the Emerald, which was staked by John Waldbeser. These first claims were followed by the development of numerous mines throughout the area in the following decades. Although most of these operations were modest in size and only operated for short periods of time, some of them were, for brief periods, among the largest gold producers in the British Empire. The first wave of mining focused on the extraction of gold and silver, but the focus shifted to lead, zinc, and tungsten as the century approached its middle decades.

One very interesting thing to note is that, according to prospector Ken Murray (personal correspondence), if the mines in this area were to be discovered today, not a single one would be able to function on its own, and most would not even be economically viable, even when worked in conjunction with others.

Many of the mines and their ore processing mills were powered by pelton wheels, which got their water through long flumes that were built in many of the creeks' valleys. The dependence of the operations on water for their electrical and mechanical needs sometimes caused production to slow or even halt in times of low water flow. If mines were located well above creeks, they were often powered by wood heat, with gas or diesel generators also being used. One example of a wood burning operation was the Ymir mine, whose eighty-stamp mill burned a cord of wood per hour, every day, all day.

Mining as a profession carries significant risks to workers' health. Until at least the end of the first decade of the twentieth century, the rock drilling equipment didn't have any watering system to keep silicate dust down, causing many miners to die of silicosis. After the development of water systems that kept the dust down, conditions improved, but the risks that come with working underground were still always present. Many miners, however, were, and still are, quite passionate about their work, citing being at constant temperatures when working underground and appreciating the clarity of that the tasks that needed to be accomplished as some of the pleasures of the job.

Clearly the mines, because of their central role in the region's economy throughout the latter part of the nineteenth and the first seven decades of the twentieth century, have played a large role in the current social and economic fabric of our area. However, they have also left significant impacts on our ecosystem's health that are certainly less than positive. In the early decades of this century, it was commonplace for a mine's tailings to be dumped directly into available watercourses, causing the water to run opaque at times. Hazel Best, a resident of Salmo who grew up in the area, can remember a boy drowning in the river around Boulder Mill Creek in the 1930s and searchers having a lot of trouble finding his body due to the high turbidity from the Yankee Girl mine. Although there is some dispute as to the mines' tailings' effects on aquatic life (some people remember the river during the mining boom as dead and some remembering it as having healthy fish populations), it is hard to imagine the high sediment loads not having detrimental effects on aquatic life. Because of the fact that the land which is still covered in tailings is generally not owned by the company which put them there and because of the high cost of undertaking restoration projects on those lands, government agencies are extremely reluctant to do comprehensive assessments of the possible impacts on the river's health.

Another legacy that has been left from the mining, and one that is perhaps more visible, is that in efforts to reveal potential ore bodies, it was not uncommon for prospectors to set forest fires in order to ease mineral detection. Although it is difficult to predict how the forests would have looked if they had not been burned, it is, at the very least, possible that the area would now have greater volumes of mature timber if these fires hadn't been set.



The following are drainage by drainage accounts provide a partial history of mining in the Salmo area.

ERIE CREEK DRAINAGE

In previous decades, there was a far more extensive settlement at Erie Lake, complete with hotels and general stores. In 1899, the settlement of Erie had a population of about fifty people. Over the following years, the population slowly increased to a peak of approximately two hundred in 1903. After that time, due to competition from the nearby settlements of Salmo and Fruitvale and a lack of large-scale mining development in that drainage, Erie's population declined until it reached present levels.

Placer production on Erie Creek once yielded coarse gold, with nuggets weighing between half an ounce and one ounce reputedly fairly common. The watercourse bore witness to significant placer use on and

off throughout the years, and, although the officially recorded yield was set at only one ounce, a more appropriate estimate is said to be between 600-1000 ounces.

ARLINGTON

The Arlington mine first opened in 1902. In its early years, it was owned by Hastings and B.C. Exploration Syndicate, Ltd., and shipped its ore to the Nelson Smelter. It employed up to thirty men, the majority of whom worked underground.

By 1909, the Arlington was considered to be one of the safest mines in operation in Canada. Its reputation for safety was supported when, in 1910, it had operated for nine years without a single day of shutdown. In 1929, the Arlington was consolidated with the Relief mine to form Relief Arlington Mines Ltd.

SECOND RELIEF

Staked in 1901, the Second Relief claim started production in 1902, and continued to operate until 1919, when the camp and mill were incinerated in a forest fire. The mine was then left undeveloped until 1927, when Oscarson Mining Company from Erie took it over under lease and bond. After that, it remained in production for a number of years in various forms. The new owners constructed a new mill and camp, as well as an 8,600 foot long flume to bring water power to the site. At that time, it was thought that there could be several thousand tons of recoverable ore in the creek bed from the tailings that had been dumped in during previous mining operations. Apparently, these claims were not later substantiated or acted upon.

Throughout its history, the Second Relief, whose property included the Relief, Relief Fraction, Grand Union, Star Shine, and Big Bump claims, employed up to thirty-five men at a time. The mine had a



Second Relief Mine — circa 1910. PHOTO COURTESY OF BERNARINE STEDILE

gravity tram to its mill and a good wagon road linking it to the railroad. Its camp was located below the mine at an elevation of 3,950 feet, nearly the same level as the creek. The site had a good timber supply and, save for the dry summers, sufficient water with which to power itself. The mine had eleven levels, and contained the third largest gold-enriched skarn in the province.

The mill was equipped with ten stamps and amalgamation equipment, with cyanide processing equipment added on later. Twenty-five tons of ore could be processed there per day, much of which was then shipped to the Northport or Nelson smelters.

SALMO RIVER

Officially, the placer yields from the Salmo were 105 ounces, although the total yield was probably more like 350 ounces, with some nuggets weighing one ounce. It is thought that previous, higher channels of the river still have a lot of placer potential. In 1926, M. Y. Anderson attempted to operate a small suction-dredge about 1.6 kilometers north of its confluence with the Pend d'Oreille. However, just before the construction was finished, a "sudden burst of high water" (Minister of Mines Report, 1926) washed the operation into the Pend d'Oreille, totally smashing it. It appears that no significant hard rock mining operations actually developed right around the town of Salmo, although at least one minor one, the Silver Dollar, had small amounts of work done on it periodically.

SHEEP CREEK DRAINAGE

The town of Sheep Creek, located at the confluence of Wulf (or Waldie) Creek and Sheep Creek, near the Queen mine, used to have a population of about six hundred. In the years of 1938 and 1939, there were 111 houses within the town's boundaries and approximately seventy to eighty residences in the outlying areas. The town used to have a four-room school, general store, barber shop and pool hall. At the time, Wulf Creek was named Waldie Creek, after William Waldie, a former owner of the Queen mine. The first road into Sheep Creek was built between the years of 1898 and 1899, but could initially only be used up until March, as it was impassable during spring break-up.

Most of the gold that was extracted from the Sheep Creek area came from quartz veins that run through quartzitic sedimentary rock, which is essentially tremendously compressed sand. The veins averaged approximately two feet wide, with some as wide as five feet. Much of the gold extraction in the northern end of the area took place between five and six thousand feet above sea level, while on the southern portion of the camp, the extraction occurred between twenty-five hundred and four thousand feet above sea level.

The Sheep Creek camp produced 678,220 ounces of gold between the years of 1896 and 1943. Mines in area used to ship gold bars weighing from fifty to over one hundred pounds at a rate of up to two bars per month. In 1908, Minister of Mines Reports suggested that, apart from the presence of quality ore bodies, the Sheep Creek camp had several natural conditions which facilitated mining, including the abundance of timber, the fairly moderate grade of the valley bottom, and the abundance of water, both for milling purposes and cheap electrical generation. It was also noted that in that year more than two hundred new ore bodies were located, a quantity reminiscent of Rossland's early boom days.

QUEEN MINE

Staked in 1899, the Queen mine operated, under a number of different owners, for a total of twenty-eight years. It was, from 1905 to 1908, one of the only shipping mines in the Sheep Creek camp. In general, it was a steady producer that played an important role in maintaining prospecting interest in the Sheep Creek area.

The mine was located a short distance up Wulf Creek. The foundations of its mill are still visible, as are some of its tailings deposits along the stream's banks. Some of its tunnels ran 150 feet beneath Wulf Creek. At times, it employed up to forty-five men.

In 1902, the Queen was worked under bond by the Holms syndicate, which extracted several

thousand tons of ore that was treated by amalgamation at the Yellowstone mill. When the Holms syndicate failed to renew its bond, one of the mine's owners, Nelsonite William Waldie, took over operations. He continued to lease the old Yellowstone mill, and had a tramline constructed to connect the mine to the mill.

In the early years of the nineteenth century, given the technology of the day, the recovery rate in the ore treatment process was fairly low, with the percentage of recovery resting at about sixty-five percent. Based on this figure, along with statistics of the Queen's output, it is thought that, although the claim produced 57,000 ounces of gold over its life span, an estimated 30,905 ounces of fine gold were spilled into Sheep Creek. Apparently, these figures were responsible for a flurry of attempts at placer mining along the creek. No one ever struck it rich though, and interest eventually dissipated.

When Mr. Waldie took over the mine, it had little visible ore left, and because of the fairly recent closure of the Yellowstone mine, enthusiasm for prospecting in the area was lagging. Credit is given to his tenacity in continuing to maintain the Queen's profitability and consequently keeping up interest in the Sheep Creek camp.

By 1908, the Queen had its own twenty stamp mill, which could crush about sixty tons of ore per day. About sixty percent of the ore's value was recovered through amalgamation of gold, with the remainder resting in concentrates of iron pyrite, galena, and zinc.

The mill and mine had flumes coming from up both Sheep Creek and Wulf Creek, each with heads of about 450 feet. This system also allowed a sawmill to be operated along with the mining equipment.

The mine remained in steady production through to 1916, but no further mention of it is made in ministry reports in 1918 or 1921. In 1924, an effort was made by the Yellowstone Mining Company from Victoria to pump out some of the water from the mine's shafts and work on the mill, but the operation failed due to a lack of capital. W.W. Philbrick and associates from Spokane made another effort to revive the Queen mine in 1926 by re-milling its tailings, but their efforts failed. As appears to have been common with many of the mines in the area, minor work was done on the site throughout the ensuing years by a variety of owners, but nothing major seems to have happened, and there wasn't a really clear date of closure on the site.

A couple of efforts were made to develop claims near the headwaters of Wulf Creek, but, although small tonnages of ore were occasionally shipped, nothing significant seems to have come of them. One anecdote of note is that one of the claims was developed using a wheelbarrow to haul the ore from the tunnels.

H.B. MINE

The H.B. Mine, predominantly a zinc producing mine, was staked in 1899, but is unclear as who actually staked it. Regardless, the mine first shipped ore in 1912, when a road was built to connect it to the Sheep Creek road. Production was then maintained until the late 1970's.

On January 6, 1916, there was a cave-in in the Zincton tunnel of the mine, which broke the back of Jens Christian Hansen, an employee who was also a local prospector. Mr. Hansen proceeded to live to the age of eighty-six.

After 1917, the H.B. remained idle until 1927, when it was purchased by Cominco, who worked it intermittently until 1946. Further exploration was done after 1946, and led to the construction of a concentrator, completed in the spring of 1953, that processed a thousand tons of ore per day. Due to low metal prices, however, the mine didn't actually restart production until 1955. Production halted again in 1966, and restarted in 1973. The mine's final closure occurred on August 17, 1978. During its life, the H.B. sometimes employed up to 145 people.

The H.B. had two main portals-- the 2800 level shaft, from which all the ore exited and most people entered, and the 3500 portal, into which most materials and equipment entered. The ore was trammed out the 2800 level by a locomotive that pulled a dozen six-ton ore carts and dumped the ore in the coarse ore bin 340 feet from the portal. Ore was delivered from the higher levels of the mine by an electric locomotive, which pulled six four-ton cars to the dump at the 2800 level.

RENO MINE

The Reno Mine was initially explored in 1914, and remained productive until 1929. At times, it employed up to forty-five men in its mining and milling operations. The mine's power was supplied by diesel generators. In the early years of this property's development, it was owned by W. Poole, Mike O'Donnel, and Thomas Kirkpatrick.

In 1928, the Reno was being developed with the capital of English investors. The camp was refurbished; cooking facilities, office buildings and garages, bunkhouses, and storehouses were built. All of these buildings were located under the number four tunnel, on a bench. Much new equipment was installed on the site, including several drifting machines, and an aerial tram between the number three and number four levels. Several hundred feet of tunneling work was done in the number three and number four levels, which contained veins which regularly showed free gold and were thought to carry good values. In the same year, a local prospector, hunter, and trapper named Charlie Woodrow was swept away in a snowslide while he was working to clear the access road to the mine.

By 1929, the Reno had a thirty-ton cyanide mill in operation which processed about 2,000 tons of ore in its first four and a half months of operation, recovering values that averaged twenty dollars per ton in gold. Most of the work done that year was stoping on the number three level using the shrinkage method, a technique that used some of the ore that had been blasted to make platforms from which the drilling equipment could reach further. The stopes ranged in width from two feet to five feet.

The value of production for this mine in 1930 was \$199,798. The total length of the horizontal tunnels at that time was 3,775 feet. To ship ore to the mill, the rock was trammed out by cart, where it was placed in a 750 foot long, two bucket gravity tram that was connected to the mill. The mill, which ran at 95 to 97 percent efficiency and processed about thirty-three tons of concentrates each day, refined the mine's ore through cyanidation. The maximum strength of the cyanide solution in which the ore was ground was one pound of sodium cyanide per ton. The process also consumed about fourteen pounds of lime per ton of ore in order to keep the pH level appropriate.

On February twenty-fifth, 1932, the mine's cyanide mill burned down, causing production to halt until December nineteenth of the same year. Rather than constructing an entirely new mill, an aerial tram was built to the newly acquired Nugget-Motherlode properties, and the old Motherlode mill was then used to process the Reno's ore. The tram was 12,800 feet long and had an altitude difference of 2,413 feet between its end points. It had a maximum speed of 250 feet per minute, and crossed the summit between Sheep and Fawn Creek at an altitude of 2,784 feet.

Also constructed that year was a new dam at the mouth of Fawn Creek. Linked to the dam was a cedar flume 17,000 feet in length. The flume was two feet high by forty-two inches wide, and was designed to deliver water to the generating equipment at a velocity of eighteen cubic feet per second and a pressure of 198 pounds per square inch. The power line to the mill was four and a half miles long, and the line to the actual mine was an additional two and a half miles long.

From 1928 to 1934, the Reno produced 49,100 ounces of gold and 24,700 ounces of silver, despite occasional production problems due to low water conditions, which inhibited power production. In early 1933, the mine shipped a gold brick with an estimated value of \$20,000 to Vancouver.

NUGGET

The Nugget Mine's first period of shipping lasted from 1907 until 1911. Waterpower was supplied to the mine and mill through a seven mile long flume, which had a head of 700 feet. The Nugget mine combined with the Motherlode in 1919, and a 12,500 foot long aerial tram was constructed to connect the two properties. At times, the mine employed up to thirty-five men.

In its first years of operation, the Nugget was equipped with a four stamp mill that crushed from 400 to 450 tons of ore per day, and recovered much of the value from the ore through amalgamation. As well, ore was rawhided to the Trail smelter for processing.



Bernard Feeney packing into the Bayonne from Motherlode Mill — circa 1905 - 1910. PHOTO COURTESY OF BERNARINE STEDILE

Ore was transported from the mine to the mill via a two-bucket aerial tram that was 1500 feet in length. The mine reached a maximum depth of 500 feet beneath the apex of the vein.

Between 1911 and 1916, the Nugget sat idle, but by 1921, it had been purchased by Nugget Gold Mines Ltd., which also operated the Mother Lode property. A large crosscut was driven from the Motherlode to reach one of the Nugget's veins, presumably to make ore transport to the Motherlode's mill easier.

In 1939, Alfred Endersby, Jr. leased the Nugget and Motherlode mines. He later proceeded to purchase the Reno, and operated the trio until 1969. In 1973, Nugget Mine Co. was formed by the Endersby family, which continues to own the properties to this day.

MOTHERLODE

The Mother Lode mine, which was located on the north slope of Sheep Creek across the mountain summit from the Nugget Mine, was first developed between 1906 and 1910. At first, its ore was rawhided to the Yellowstone wagon road during the winter, where horse teams took it to the railroad in Salmo to be transported to smelters. By 1910, however, sufficient ore had been blocked out to warrant the construction of a mill for the mine. A stamp mill and a state-of-the-art cyanide plant were opened in 1912. The facility, although somewhat more advanced than was required for a mine the size of the Motherlode, was the first of its kind in BC, and was located on Sheep Creek. It could process up to 125 tons of ore per day, which was delivered from the mine by an aerial bucket tramway.



Kootenay Belle. PHOTO COURTESY OF BERNARINE STEDILE

KOOTENAY BELLE

The Kootenay Belle mine was located next to the Yellowstone property, just above the junction of Wulf Creek and Sheep Creek. In the first few years of its operation, development was slow, with only small tonnages of ore being extracted. Much of the extraction was actually just a spin-off from the exploration process, rather than being a product of actual mining.

In 1908, the Kootenay Belle was worked by J. L. Warner and Associates, who installed a four stamp mill, which crushed 1,980 tons of ore that was processed by amalgamation.

By 1910, the mill had expanded somewhat, but was “of a rather temporary character,” (Minister of Mines Report, 1910.) It would appear that the mine saw little use between 1910 and 1916, as the mill and its aerial tram were in extremely poor condition and the owner was trying to sell the property.

YELLOWSTONE MINE

The Yellowstone employed many men for a very short duration before its ore was exhausted. It was staked in 1898 near the junction of Wolf Creek and Sheep Creek. In 1899, this mine employed up to one hundred thirty men, but didn't ship any ore. A ten stamp mill was constructed in 1900 to treat 8,467 tons of ore, but the mine shut down by the end of 1901, due to the exhaustion of visible ore. The Yellowstone's mill was, however, leased by the Queen Mine, which had not yet built its own facility.

ORE HILL

The Ore Hill opened in 1906 and was situated on Coon Creek, about 2100 feet above Sheep Creek. Although it never attained a very high rate of production, it did, by 1918, have a small mill with a seven-ton capacity and a couple of stamps. At that time, the mine employed six men. The mine consisted of five claims: the Ore Hill, Ore Hill No.3, Dixie Standard, Fraction and Last Dollar.



Sheep Creek Mines Ltd. in 1935, an era when the mines in the vicinity were producing quantities of gold bullion. The ruins of the old Queen mill can be seen at the left. PHOTO COURTESY OF THE SALMO MUSEUM

THE EMERALD MINE

The Emerald was located near the summit of Iron Mountain, between Sheep Creek and Lost Creek. It consisted of three different claims: the Emerald, the Jersey, and the Dodger. Unlike many of the mining sites that experienced large amounts of mining activity only to have their ore bodies exhausted within a few years, the Emerald Mine was host to a wide variety of proprietors, and contained a diversity of minerals which were extracted over a period of several decades and at varying levels of intensity.

The Emerald Mine site, as it was to be named, was prospected and staked by John Waldbeser in 1895, when he mistakenly believed that an outcrop on Iron Mountain contained high grade gold and copper ore. Although this initial prospecting proved to be disappointing, a body of quality lead-zinc ore was later discovered nearby, leading to the formation of the mining company, Iron Mountain Ltd. Mr. Waldbeser later staked the Jersey lead-zinc deposits in 1899.

The mine's first period of operation was from 1902 to 1925, during which time its high-grade ore was exhausted. From 1906-1925, the mine was the largest producer in the West Kootenay, with its ore carrying values predominantly in lead. The mineral deposit into which the Emerald tapped was a continuation of the one exploited by the HB Mine, although the HB produced mostly zinc.

The first recorded shipment of ore from this site occurred in 1906, and it involved the rock being rawhided from Iron Mountain down to Sheep Creek. It then continued on to Salmo, where it was loaded on a train and taken to the Trail smelter. A small concentrator was built below at the mine in 1919, but a forest fire later destroyed it in 1934.

In 1942, Harold Lakes from Nelson explored the Emerald property for molybdenite, but he instead found scheelite, a mineral which contains tungsten, a valuable mineral in making lighting, electrical

components, and alloys which require high melting points. On November 25, 1942, the Canadian government expropriated the Emerald mine site for \$424,000 (US) in order to produce tungsten for the war effort. The crown corporation was called Wartime Metals Corporation, and it invested \$829,100.60 in the site for the construction of, among other things, a three hundred ton concentrator. The mining proceeded for only a short time, ceasing on September 10, 1943, with all processing operations halting on October 15 of the same year. During that time, however, some sources claimed that the mine was the “Free World’s” only source of tungsten.

In 1947, the Emerald Mine was purchased by Canadian Explorations for \$950,000 in order to continue producing tungsten. That work continued until the end of 1948. In the meantime, zinc ore deposits were being developed on the Jersey portion of the Emerald property, leading the mill to be converted to lead-zinc production in March, 1949.

In 1951, with the onset of the Korean war, the Canadian government once again entered the Emerald’s affairs, paying \$328,000 for the rights to the mine’s tungsten ore, as well as covering the cost of the mining and financing the construction of a 250 ton mill. The mine then proceeded to make tungsten for Korean War, funded through a long-term contract with the American government.

Later on, engineers found a 60,000 ton body of high quality lead-zinc ore in a “glory block,” or block of high quality ore that is available to open pit mine. The Jersey portion of the mine was worked in this fashion until 1970, when the ore was exhausted.

The mine’s town site was closed on September 1, 1973, but instead of being abandoned as many towns were, it was auctioned off, except for the heated swimming pool. At times, the Emerald site, under ownership of Canex, employed up to 1,000 people.

PORCUPINE CREEK HUNTER V

In 1925, the Hunter V, owned by Feeneys’ was located on the height of land between Hidden and Porcupine Creeks, was owned by Consolidated Mining and Smelting Company. It had remained dormant for a number of years prior to the take-over, but had operated in varying capacities since at least 1905. It was linked to ore bins along the Great Northern Railway about two miles south of Ymir by an aerial tram 18,000 feet in length. It was generally mined with open pit methods, although there were times when ore was extracted from underground tunnels. By 1925, the ore that was produced was usually used for fluxing at the local smelters, although there were sufficient gold and silver values in the ore to cover the costs of production.

YMIR

The town of Ymir was the principle hotbed of mining activity as the Salmo area started to gain attention in the late 1890’s. The first mine in the area, the Ymir, was staked here, with many other operations quickly following suit. Although the town was booming for awhile, this first activity had largely dwindled by 1905, when a combination of low ore prices and the exhaustion of readily accessible, high grade ore bodies caused the town to fall on hard times. Except for a brief upsurge during World War One, the town remained in a depressed state until the early 1930’s, when the development of flotation techniques for refining ore once again allowed some of the mines to reopen profitably. These mines, which included the Ymir, Yankee Girl and Goodenough, were almost all closed again by the end of World War Two.

DUNDEE

The Dundee claim was first staked in 1896, with the main ore vein measuring approximately eighteen feet wide. Much of the ore extracted was valued at up to \$30 per ton. The mine had a mill constructed in 1898, but the shaft house and mill burned down in 1899. This claim was later integrated into the Yankee Girl.



Overview of Ymir — Looking down from the Yankee Girl. ORIGINAL PHOTO COURTESY OF DIANE BURGESS.

YANKEE GIRL

The Yankee Girl claim was staked in October of 1899. Located 2500 feet above Ymir, the mine went through a variety of owners until 1911, when it was taken over by Hobson Silver Lead Co., Ltd., which proceeded to carry out development work and ore shipments fairly continuously, albeit at fairly low volumes, on occasion, until 1918. By 1919, a 6000 foot long aerial tram had been constructed to link the mine to its mill, which was located on the banks of the Salmo River. The tailings deposits are still visible today. The mine shut down in 1920, but was reopened in 1926 by Yankee Girl, Limited, who shipped steadily to the Trail Smelter.

By 1928, the mine property was, according to Minister of Mines reports, “devoid of timber,” causing a timber limit to be purchased about one and a half miles further up Bear Creek. At that time, the mine had thirteen buildings constructed for a new camp on the south side of Wildhorse Creek, including a two-story bunkhouse with twenty-eight two man rooms, a two-story boarding house with a dining room for one hundred fifteen men, an office building, a compressor and substation room, blacksmith shop, and a stable. Electricity was supplied by the West Kootenay Power and Light Company via a thirty-one and a half mile long power line. As late as 1940, the Yankee Girl was still operating, employing a crew of seventy-eight men. In that year, 53,527 tons of ore were milled, with about 10,000 ounces of gold and 55,000 ounces of silver produced, along with some lead and zinc.

YMIR MINE

The Ymir Mine was discovered by Jerome and Joseph Pitre in 1895, but they later sold the mining rights to S.S Fowler, of Ymir Gold Mines Ltd. The mine was, for a brief period, the foremost gold producer in BC, and one of the most significant mines in the British Empire. Although it shipped only 7400 tons of ore in 1899, its eighty stamp mill was completed in 1900, which permitted it to process 42,660 tons of ore. Each stamp could crush from two and a half to three tons of ore per hour, with the entire mill crushing up to 4000 tons per day.

In 1901, a “Bonanza Shoot,” which is a particularly rich vein of ore, was struck, allowing the mine to produce up to twenty 100 ounce gold bars per month. The Ymir’s high production continued throughout 1902 and 1903, but by that time, gold prices were dropping. In 1904, 30,000 tons lower grade ore were extracted, but the decline in quality signaled the end of the “Bonanza Shoot.”

In subsequent years, numerous efforts were made to try and find its continuation, but none met with success, and, by 1907, with the mine’s reserves exhausted, the search for this rich vein’s continuation ended. Although further exploration was attempted in later years, nothing of significance seems to have happened since then.



Ymir Gold Mine — circa early 1900's. PHOTO COURTESY OF BERNARINE STEDILE

AN INTERVIEW WITH BOB ROTTER ABOUT HIS EXPERIENCE MINING

Bob Rotter worked in the Gold Belt Mine during the winters of 1939 and 1940 because he couldn't find work in the timber industry. The mine was located up Sheep Creek, between the Queen, Reno, and Kootenay Belle properties. In his words, "Salmo never saw a depression" in its early decades because of the numerous mines which were constantly entering into and exiting from production.

As a general labourer, Mr. Rotter was paid \$4.50 per day, compared to the miner's wage of five dollars. Because there was no shortage of potential workers, the pressure to move quickly for the entire nine-hour shift was intense, and it was not uncommon for slow workers to be fired on the spot.

Working conditions in the mine were terrible, with poor ventilation and no general lighting system save for an electric light at the top of the lift shaft. Each worker had his own carbide light, which would also act as a signal of poor air quality. If the light started to flicker, the miner knew that he had to leave quickly because oxygen levels in the air were too low to survive. Most of the air quality problems were caused by the exhaust gas from the explosives. In Bob's words, the mine stank so much that you "could have a crotch full of manure and not notice." When a worker came to the surface to escape the bad air, he would frequently become nauseous. Occasionally, a new worker would be found dead after a shift, gassed in one of the stopes. Injured people were put into basket stretchers and were hoisted out of the mine to be taken to Nelson, but with no ambulance service, taxis were often called to substitute. In general, the mine seemed to have relatively few accidents, with injured workers being well taken care of. Water was pumped from the shafts twenty-four hours per day, with six hour breaks between workers' shifts to allow the air pumps to ventilate the area.

The ore was hand trammed from the upper levels of the mine, with a single worker pushing a one ton ore cart. When the ore reached the lower levels of the mine, the ore carts were hauled out by a horse, which pulled strings of two ton cars. When returning to the mine, the horse could haul twenty empty cars with ease. The main level of the mine used battery operated locomotives for hauling.

Waste effluent from the cyanide mill, which had a terrible odour, was run directly into the creek, whose water was consequently a muddy opaque and turned into an ooze during periods of low flow. The tailings leaving the mill were assayed every few hours to ensure that the chemical processes were well balanced, and valuable metals weren't being flushed away.



AN EXPLANATION OF MILLING TECHNIQUES

One of the biggest challenges of mining is the extraction of the valuable metals from the ore. Much of the ore that is removed from the mine consists of gangue, or worthless minerals. Since the valuable metals are generally either chemically bonded with other elements or well surrounded by gangue, the ore must be crushed very finely in order for the chemical treatments to act effectively. To work efficiently, the mills had to crush the ore so that the particles could fit through at least 200-mesh screen, which had holes that were only one two-hundredth of an inch across. This was accomplished through a series of processes designed to continually reduce the ore to finer particle sizes.

If the mine had its own mill, the coarse ore would be trammed to the mill, where it was put through a Grizzly, that separated out the smaller chunks of ore which didn't need to go through the breaking process from those that did. Breaking refers to the reduction of ore pieces from the sizes at which it leaves the mine to still relatively large dimensions of approximately two inches across. After being separated, the larger pieces of ore would go through a jaw crusher, which would break the ore into sizes that could be accepted by the stamp mills. A jaw crusher is a massive machine that breaks ore between a fixed metal plate and a plate that is lifted vertically to strike the rock.

After the jaw crusher, the ore was placed back with the pieces that had previously fit through the Grizzly and continued on to the stamp mill. Stamp mills are basically giant mortar and pestles which have a series heads that are lifted by cams and then drop back by gravity to strike the ore. They were used either to

crush the ore to its finest size or to break it into intermediate sizes that were later run through tube mills. The ore was wetted throughout the stamping process. If the mill was being used as the final crusher in an amalgamation process, mercury was added to the ore as it was crushed. In the early part of the century, gold was extracted either directly from the crushed ore through settling processes or through a process called amalgamation, which basically involved dissolving the gold into a mercury solution. If the ore was being treated through cyanidation, then the ore was crushed in cyanide solution. Fortunately, the cyanidation process worked most efficiently using solutions of lower concentrations. One example is a mill that used one pound of sodium cyanide per ton of ore. In cases in which the ore contained considerable free gold, that is to say, gold appearing in its natural form, the ore could be crushed in just water. The gold particles would then be separated by gravity to form a concentrate.

Regardless of the process used, the mortar had a discharge opening which was fitted with a screen to ensure that uniform sizes of particles were produced. Coarse particles remained in the mortar until they could fit through the screen. When in an amalgamation process, the discharge would be splashed onto copper plates that were coated with mercury amalgam. As the ore solution washed over these plates, the gold would bond with the mercury while the rest of the minerals washed away.

In the case of the Motherlode mill, which, at least later on in its operation, used the cyanidation process and used its stamp mills as intermediate crushers, the stamps broke the ore into diameters one-fortieth of an inch across.

Following the stamp mill, the ore would be fed through a classifier, of which there were many types. The principle behind all classifiers, however, was that the crushed ore solution was fed into the base of a water-filled inclined box. The coarser particles would settle to the bottom of the box and then be slowly moved towards its top, while the smaller particles wouldn't settle and would be washed out of the system with the overflow and moved onto the next processing step. Meanwhile, the coarser particles would be thoroughly washed and then would move into a tube mill.

As the name suggests, a tube mill was a horizontal cylinder which filled about half-full with either metal balls or metal rods. It is the final crusher in the milling process and worked by revolving while the ore solution was fed into it. The revolving motion caused the balls and rods to roll against each other and the particles of ore, reducing the minerals to very fine particles. The discharge from the tube mill was then put through another classifier, often a Dorr classifier.

The Dorr classifier moved the particles which were still coarse, up via a ladder-like rake that dipped into the sludge, shifted it up a bit, lifted out again, and then returned to move the sludge again. As before, the finer particles didn't settle, and moved on to the next step, which was the thickening process.

The thickening process was intended to eliminate the excess liquid from the ore solution. It usually involved a tank with rotating rakes that influenced the solids towards its centre, where they were sucked out. Water was removed from the upper part of the tank via taps.

Following this process were a few more steps in which the gold was precipitated out of solution using zinc dust. The precipitate was then smelted into bullion.



GLOSSARY

Crosscut: A tunnel made to intersect an ore body

Drift: A tunnel constructed to follow an ore body

Galena: Lead sulphide

Gangue: The nonmetallic portion of an ore body, usually of little commercial value

Level: A horizontal tunnel

Ore: Rock which has sufficient mineral values to make its extraction and sale profitable

Pyrite: Iron sulphide

Shaft: A vertical tunnel

Stope: The work site from which the ore is extracted

Shrinkage stope: A stope in which some of the ore that is blasted from the stope is used to support its walls and as a platform to work from

Sulfides: Metals which are bonded to sulphur

Sphalerite: Zinc sulphide

Tunnel: A horizontal shaft that is open to the atmosphere at both ends

Veins: Veins are mineral deposits that are formed by mineral waters seeping through fissures in rock. Over time, enough minerals precipitate out of the water to fill in the fissure. The mineral water is usually found at great depths and pressures and is therefore a good solvent. As the water rises through the fissures, its temperature and pressure drop, causing the minerals that it is carrying to crystallize in the fissure.

Winze: A vertical shaft that is sunk from within a mine and therefore isn't open to the atmosphere



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FORESTRY HISTORY
OF THE SALMO RIVER
WATERSHED

PREPARED BY:

Darcy Torrans

Salmo Watershed Assessment Youth Team



Bernard Feeney and Chris Hansen — circa 1920's.

PHOTO COURTESY OF BERNARINE STEDILE



There was smoke and the forests were burning. Great cedar trees moved and wailed in the searing heat.

Men with blackened faces struggled to contain the fires.

He could hear the voices of the men and women desperately trying to save their homes and the very trees that would soon become their livelihood.





IT IS SAID THAT MINING OPENED THIS REGION FOR SETTLEMENT. HOWEVER, HARVESTING THE FOREST provided the necessary materials to establish the new land and extract the valuable resources it held. Many things were different in the forestry industry in the pioneer age. Time has modified forest structure, equipment, technique, management practices, and logging companies.



FOREST STRUCTURE

The wilderness had a very different appearance before settlement by the white man. Forests were composed mostly of cedar, pine, hemlock, balsam, and larch. Some pioneers have said that the timber between Salmo and Nelson was so thick that sunlight hardly reached the ground.

Trees back then could be found 14 feet in diameter. Yes, that is right. In 1882, Western Red Cedar trees 14 feet in diameter and over 60 m tall could be found. Those trees could be more than 300 years old.

All logging efforts in the Salmo Valley were done in the smaller drainages.



MANAGEMENT PRACTICES

There have been four major management philosophies involved with the forestry industry in BC. The first started when the white man settled the area. It was unregulated exploration. Harvesting for profit was done within the bounds of technology. A change happened in the 1940's. From this time to the late 1970's, the Forest Service tried to apply some regulations to limit over cutting. Forest rangers timber cruised and put boundaries on timber sales. Then, the Forest Service let logging companies bid on the timber sales. This was a result of more efficient technology being used to harvest. The third management philosophy began in the 1980's. An ecological approach was introduced with emphasis on site specific management. Now management is concerned with social forestry, which is the fourth philosophy. Logging techniques are totally involved with landscape and site specific management. The public has a much larger input. Concerns now include aesthetics, wilderness values, and job security. This progression of ecological concerns does not mean there were none before the turn of the century. Men like William Feeney didn't believe in cutting in areas supplying domestic water, a concern we share today.

The first Forest Act was established in BC in February of 1912. Its mandate was to develop a greater lumber industry, outline prompt utilization of mature timber, and ensure a good second crop for harvest, in other words, select cutting. Before the Act, the government was only responsible for collecting royalties from wood cut on crown land. The Forest Service would provide limited provisions for forest fire prevention and suppression because of the Act too.

The first forestry commission was held in 1912. From the commission, the Forest Branch of the Department of Lands was created in 1913. Until 1914, timber harvested on crown land was charged by royalties through timber licenses or the sale of land.

In 1946, the Sloan Commission gave us an assistant ranger with a full-time position. It also created the first Tree Farm License (TFL). A logging company needed a good-sized piece of private land to get a TFL. Consequently, in the 1950's, bigger mills bought out smaller mills and their quotas to put enough material through their mills. Smaller mills couldn't compete with the bigger companies. They eventually accepted deals from the larger companies.

There was a total reorganization of the Forest Service of BC in 1979 and 1980. Regions today were called districts.

The British Columbia Forest Service was enacted in 1912. Forest rangers, hired by the Forest Service at this time, were very experienced with the activities in the forest. The Forest Service used to hire year-round

employees and assistant rangers for seasonal work. George Schupe was the ranger in charge of the Nelson district in the 1940's. He worked his assistant rangers hard.

A forest ranger was responsible for forest protection, forest management, and range management. Under range management, he was responsible for allocating crown range for summer cattle grazing. Forest protection involved fire prevention and suppression. In the spring, they would prepare for the fire season. This was called preorganization. It involved many things, such as trail building and maintenance. Before the advent of helicopters, fires were fought on the ground, by hand with grubhoes and shovels. They found potential manpower, and arranged tools, transportation and machinery. During fire season, they were always on alert.

At the end of fire season, every fire had to have a report. It did not matter if it was a small spot fire. If it was caused by a train, it needed two reports. When the fire reports were finished, an Operations Annual Report was submitted by the district office. All activities connected with fires were outlined in it.

The ranger's responsibilities for timber management included timber cruising, timber sale volume estimates, stumpage royalty billing, and harvest inspections. Winter was usually spent doing timberwork. They did a lot of their cruising in early winter because most of summer work involved fire suppression and improving trails or range land. If they had finished preorganization in the spring, they would do timber cruises on stands waiting to be done.

Timber cruising involved running on a bearing with a compass. They surveyed half a chain (or 10 meters) on each side of the line. Trees species, number of trees, timber type changes and areas not sufficiently stocked were recorded in the field notes. Around 1919, timber cruising crews consisted of an axeman, rod man, and compass man. On bigger jobs, there were two axe men and a cook. A timber cruiser got around \$4 or \$5 plus board, travel expenses and travel time paid for on each survey. Cruisers usually slept on the ground in a bough bed and cooked over an open fire. Their job included laying out roads and boundaries of timber limits. The cruise data from the samples would determine the estimated volumes of the timber stand. Then they could come up with a value, which would be the basis for charging stumpage.

William Feeney was a forester in 1882 around this area. He laid out areas to be harvested under ERC Clarkson, a real estate company from Toronto. Even in the early years, he believed there should be no



Crew from the Second Relief Mill on a Sunday hike — circa pre WWI. Left to Right: Mr. Marshall, Stan Feeney, Joe Dyson, Mr. Bergman or 'the Crazy Dutchman', Fred Ball. PHOTO COURTESY OF BERNARINE STEDILE

harvesting too close to watersheds. He also felt that the Nelson watershed should be uncut. The older rangers notice there is a lot more red tape in the forest industry today.

Riparian zones were considered sensitive areas and therefore selectively logged, not clearcut. Trees in the riparian zones are important to keep water temperatures cool, which is essential for fish survival. Trees help hold the soil and retard erosion. They did realize the negative effects of logging on an ecosystem that involves fish and wildlife.

Every year the district office would make a Management Annual Report. It outlined all activities in sawmills, operating, scaling, cruising, and cost factors for logging. The Forest Service got a lot of cooperation from the companies. It took from about November to December to compile. Then they got caught up in cruising on snowshoes.

Individual companies would fill out an application to apply for a timber sale. Clearance was given by the government if it did not encroach on mineral claims. Most mineral claims had surface rights, which included timber rights; therefore, you had to be careful around mineral claims. The Forest Service would then cruise the area requested. They would decide if what they assessed, was suitable for harvest. Timber sales were as small as 20 acres or more than 1700 acres. This was dependent on topography. It is interesting to see how the forest industry has changed. The amount of timber in a stand was first measured in board feet, then cubic feet, and now cubic meters.

After the cruise, the proposed cut block would go up for bid to the logging companies. The ranger could direct a sale to a certain company. This was usually done on smaller sales where the company was already working. Good relationships were created as a result. The ranger would set the selling price according to logging costs, profits for the operator, logger, mill, and stumpage rate.

A public notice would advertise that the timber sale was up for bid. Anybody could pay the required deposit and make a bid. You did not have to have a sawmill or be from the area. Sometimes there was a lot of competition at an auction. One involved five sawmills that made a total of 60 bids. Auctions were held on Saturday mornings. To raise a bid, you would increase the bid per thousand board feet on all the merchantable tree species or just certain ones. A successful bidder had to produce cash or cheque for 10% of the auctioned value for a security deposit. If the company did not waste timber during the logging process and followed the timber sale agreement, they got the security deposit back. Stumpage was paid to the government as harvesting was completed. The licensee of the timber sale was responsible for laying out roads.

Around the 1930's and 40's a ranger usually came around to schools. He would interview and hire some of the interested young men for the summer. A teenager would get \$45 a month plus housing, lunch and other expenses. They would mostly fight forest fires for the Forest Service. In those days, positions were not advertised. People were appointed positions. Now with better organization and communication, more people from further away can be candidates for jobs. Those who felt qualified, could challenge the assistant ranger exam.

Trees were felled in herringbone fashion. They would land so it was convenient for the logs to be picked up on the skid trails. Using this method there was less soil compaction, less small trees being knocked down, good seed source, and no need for overall management for age class or amount harvested. There was not any or very little reforestation going on because enough trees were left for the forest to naturally sustain itself. They did not have to worry about sustained yield because not every tree was cut down. The standard tree that could be cut in the 1940's was of 14-inch diameter at breast height (Dbh). The method that left the smaller trees was called high grading. The sawmills couldn't handle anything less than 8 inches; therefore, this was the standard top size.

In the Interior, clearcutting and slash burning didn't exist. Waste from harvesting was just lopped and scattered in the bush in the early years. Now they can chip it and send it to pulp mills so every tree can be harvested for something. Wood chips were a waste resource that large sawmills could take advantage of with pulp mills around. Selective logging was always the technique used. Machinery was smaller and logs were cut and skidded in short lengths so they could fit in between trees without damaging live ones. Horses were not capable of skidding full length trees because of these factors the second growth crop was ensured, instead of

being destroyed as in clearcuts.

The construction of pulp mills, like Celgar, provided a reason for clear-cut logging to occur in the Interior. This profitable method of harvesting started in the 1950's. Before, not every tree could be cut down because of diameter restrictions. A tree had to be larger than a certain diameter in order to be legal for harvest. Prior to the 1950's, clearcutting was mostly done on the coast. Erie Creek was the first drainage that had a clearcut in the Salmo watershed. Rotten hemlocks and cedars were cleared out in that operation, much good timber was burned. When clearcutting became more popular, older forest rangers felt it was very wasteful. No seed or second growth trees would be left. Just the merchantable timber was taken, and the rest was slash burned.



EQUIPMENT AND TECHNIQUE

Tools and techniques were more labour intensive back then. The first efforts in logging involved no power tools. Everything was accomplished by the power of your own muscles. Gradually, technology replaced the enormous amount of energy needed to harvest the forest. With the change of equipment came the need for different techniques.

Hand falling, with one-man or two-man crosscut saws was the method used to cut down the trees. Swedes called it the misery stick. Saws were sharpened during the workday at noon and every night after supper. Sharpening a saw was an important skill. You could make sawing huge trees a lot easier on yourself if you did it properly. They had to be sharpened differently if sawing green or dry timber. You had to leave more of a set, or space, for green wood. Coal oil was used to prevent the saw from binding or gumming up in pine and larch trees. Larch is so hard when it is dry that it is like cutting steel. Some of the trees were so big that it took a whole day just to fall one tree. The next day all you might do is buck and limb the tree.

Fallers were paid by contract for the thousand board feet in the trees they felled. It was around \$3.50 during the 1930's.

Springboards were commonly used on large cedar trees. On some large spruce and white pine, they had to use springboards too. Springboards were four feet long and eight to twelve inches wide, with a narrower, skinnier end. The smaller end would fit into a slight hole axed into the tree. The logger would jam the springboard into the tree and then stand on it. They would allow the faller to cut the tree in a spot where it was not hollow or had butt swell. Old cedars usually develop butt rot in the centre of the tree and have a wide sloping butt. Today, evidence of this method is very commonly seen on old cedar stumps.

To fall big cedar and spruce trees, loggers would put limbs on the ground where the tree might fall. This would cushion the fall so the massive trees would not shatter when they hit the ground. To make a tree fall in a certain direction a two-foot wedge was used on the opposite side. Wedges were hewn by hand from dry birch. After falling, they delimbed and bucked the log to length. Double bladed axes were the tools used to limb logs. Some people used five pound heads to take off big branches.

Loggers cut down trees all winter. They preferred to limit logging as much as possible in the summer because it was easier to pull logs out on snow with horses. Sawmill season in the deep woods started in April and went to October. It was not efficient to be sawmilling in the cold winter months because the wood would freeze. Logs were waiting for the mills in the stockpiles in the spring.

Chainsaws were not used until the 1920's. When they were introduced, crosscut saws would out cut a chainsaw. The early chainsaws needed two men to operate because it had six-foot bar and weighed 135 pounds. Many problems occurred with the new machines. They required lots of maintenance and would spend most of the time in the shop. Rapid improvements in chainsaw models were made every year.

Stihl chainsaws were brought from Germany to the Coast in 1937. During the Second World War, Stihl chainsaws were not available from Germany. In the 1940's, a Power Machine chainsaw cost \$407. You could buy one in Nelson at Sinnerud Truck and Tractor. A realistic day for a good faller using a chainsaw was 20,000 board feet per day. They made around \$600 for a twelve hour day's work.



Jack and Chief, Bayman Feeney's Shires, 1 ton each — circa late 1920's, early 1930's. Bernard Feeney skidded on bare ground a cottonwood log containing 1100 board feet without block and tackle with this team. PHOTO COURTESY OF BERNARINE STEDILE

Feeney's first chainsaw was a Hornet. It was a two-man machine built on the coast. Bayman Feeney used it as a one-man saw.

Horses did the work machinery is expected to do today. Horses were very useful in the early years. They were busy all year round logging, ploughing, and pulling wagons.

The first workhorses in the area were brought in by boat or train from Revelstoke, down the Arrow Lakes or from the South from Bonners Ferry or from the East and South through Creston. From 1905-1910, they were brought to BC wild from the Prairies. They had no experience in the bush. Some horses would not accept the new working conditions. Bayman Feeney, at the age of 15, drove a team of horses (Shires) that weighed a ton a piece. Later they used Percherons.

Each day you had to get up two to two and a half hours before you took the horses to work. They had to be fed, watered and cleaned. Their harness was cleaned too to prevent sores from forming on their shoulders. Some owners grew their own hay to feed them. Most hay was brought in by rail for logging operations and livery stables. There was not a veterinarian in the Salmo area at the time so owners had to attend to the health of their own horses. You had to take out feed to the woods for them. Water was not always available especially in the winter, if so, snow had to be melted for them to drink. When you got home, you had to water and feed them again. You also needed to check their shoes. If they were damaged or missing, you had to replace them. Some horses wore sharp shoes, similar to cork boots. The corks in the shoe would prevent them from slipping on the forest floor. If you got five hours of sleep a night, you were lucky. The hours were long, the work was hard, and the pay was small.

If a team of horses could not move a log, there was no possible way to move it. Block and tackle systems were set up to give the horses some advantage when needed. The block and tackle system involved

pulleys that were secured to a tree. Horses would provide the power for moving the heavy logs. Surrounding trees were used to anchor the pulley system. Six-inch shives were another piece of equipment involved. Snatch blocks were generally four or five pounds, three feet long and had a shive in the middle. They were hauled to the site by horses. Only short distances could be gained when using block and tackle before having to reset. Block and tackle systems could be bought in hardware stores in the area. Earlier on, you had to bring that equipment in from somewhere else like Spokane or other cities where it was available.

On a logging operation with a reasonable slope, a team of horses was hooked up to two or three logs connected end to end by timber dogs. A dog is a piece of bent iron driven into the log at a slant. It was easy to pull off when there was no forward tension from the horses. Heavy use of the dogs would cause some of the dogs to break off in the log. When the saw blade hit the extra iron parts would break and saw operators were sometimes were injured.

Some people preferred work with a single horse. On heavy logs, they would use the whole team. They would have to run if dragging a log downhill so that the log would not hit them. If a horse broke its leg, it would be shot on the spot. You also had to watch how the horse started skidding a heavy log. You could easily hurt the horse's shoulders if it pulled sideways.

A skidway was a well-used path made by the constant use of horses. Sometimes the groove in the ground would control the path the logs would go. A singletree was attached to the horse's harness tugs. A skid chain ran from the singletree to a set of tongs driven into the log. If timber was small, a second log would be attached to the first by a timber dog.

Some horses became so smart that nobody would have to drive them. The horse would pull the log to the landing, wait for a man to unhook the log, then it would go back to the bush and wait for another. The horses knew when it was lunchtime everyday and would just quit working until fed and given water. They were still used a lot in the forest in the 30's. In the 1950's, people were happier to use tractors because of the amount of effort needed to maintain horses.



Len Woods and Bernard Feeney at skidway at lower end of Feeney's – South end of the flats — circa 1915.

PHOTO COURTESY OF BERNARINE STEDILE

Some tractors and cats started to be used at this time. The first cats did not have dozer blades. They were used for pulling loads only. Small logging operations still used horses contracted out by their owners after large machinery was introduced. For a long time, they worked together on logging operations hauling logs out. In the early days, a D-4 Cat was big. D-8's had cable-lift blades and were only used for highway work. In 1950's, operators charged \$20 an hour. Most logging roads were built with D-6's. Roads were difficult to build in rock because cats were not equipped with rippers. It was necessary to do much more drilling and blasting. Roads did not cost nearly as much as they do today. Powder was cheap.

In some operations, a cat would haul the butt end of the tree. Horses came in after and pulled out the lighter tops. This way, the time used to set up block and tackle systems could be eliminated.

The bucked logs would then have to be skidded out onto a skidway, then to a sawmill, water flume or road. If pulled to a road, men using peaveys rolled logs on a pile. Peaveys were easily broken when handling logs. Handles were expensive to replace. The solution for most men in the 1930's was to find a yew tree and carve their own handle.

Next, the logs were loaded onto a wagon or truck. Loading methods were rolling by hand with a peavey or using ginpoles. Some logs were put through a sawmill on site. Wagons were usually bought from the States or a foundry in Medicine Hat. Breaking skidway was the term used when rolling logs onto a truck. This method was potentially dangerous because many logs might start to roll at once. There was no way to stop them once they got going. When the load of lumber got to Salmo, it was off loaded and pulled together on the yard by ginpoles then loaded onto train cars.

Flumes and chutes were used to move large volumes of timber from places where using horses was not practical. Flumes used water to move logs down a trough system. Some flumes had water running through them all year round.



Cross loading long poles over 2 cars in Salmo — circa pre WWI. PHOTO COURTESY OF BERNARINE STEDILE

Chutes did not require water to move the saw logs downhill. Instead, they were greased. Chutes needed to be used when there was not a good water supply or when the grade was too steep. If the grade was too steep, the water would run down too fast to move logs. Chutes were never made of lumber, just round logs. The size of the logs that were going down the chute would determine if there would be three or four logs in each section. The poles would be hewn and smoothed a bit for efficiency. Timbers secured to the ground would support every eight feet. Chutes were made from fir, larch or hemlock

Flumes were constructed from jack pine (lodgepole pine) logs, 20 to 30 feet long. These logs were nailed to available trees. Water, supplied by streams, was used to propel logs downhill. Logs were hauled to the flumes before spring. During high water, they were let down. Logs travelled at great speeds down these flumes. Cedar logs were hard to flume because they seemed to fall off the corners. At the end of the flume system, there was a pond or a lake with a sawmill on the shore. Flumes would keep being built uphill as the logging proceeded. A crew of six to eight men could build one to two hundred feet of flume in a day. Contracts usually charged \$1 for each foot. This was a great way to move logs because horses would not have to drag logs for a long distance, but the system was expensive to fix and time-consuming to make. Trucks replaced the need for flumes and chutes. Roads now reached into the steeper areas.

Wooden trough flumes were used in Clearwater Creek, Boulder Creek, and Porcupine Creek. The one in Clearwater carried lumber. There was also one in Boulder Creek. The sawmill there needed 60 thousand board feet per day from the flume to keep busy. This was because it was a fast sawmill, equipped with gunshot feed, carriage steam loaders and niggers. A nigger was a steam-driven hydraulic ram used to turn the logs.

Logs needed to be lifted onto wagons, trucks, or rail cars. The ginpole was used before cranes were invented. A ginpole was an upright pole buried in the ground with a second pole attached by a hinge at the bottom. This second pole was supported at a 45-degree angle by a cable running through a block at top of the vertical pole. The upright pole was stabilised by guy wires.

The arm was able to swing around the radius of the upright pole to enable the ginpole to move a log from one place to another. Hand winches on the support pole beside the hinge on the arm controlled this. If you wanted to move the arm to one side, you would just tighten the line on that side with the hand winch. The line was connected to the end of the arm and would pull it in that direction.

A pulley system was set up to the end of the arm to raise or lower the logs. At the end of the line were two tongs that would be placed in each end of the log or one set of tongs in the middle of the log. It was a challenge to place the tongs in the right places so the log would balance. If set, the arm could move up or down. The line set up with the pulley at the end of the arm pulled the log into the air. A team of horses, or later, car engine, would power the pulley system. Ginpoles were used until 1937.

Jammers were the next piece of equipment used after ginpoles to lift heavy logs. A jammer is a sturdy truck with an "A" frame on the rear. Sometimes old chain driven trucks with solid tires were used. Some of the old trucks could not move themselves, so a crawler tractor would tow them to the next location. Most could move on their own.

Jammers had a similar cable setup to a ginpole. It had a car engine driving a winch or a crawler tractor for power. You would find a free loading drum on the car engine. A handle would engage the drum to allow the shaft to turn. It was important to put on the brake after you let go of the handle. The tractor would just move away from the "A" frame to pull the log in the air. It was very efficient for the job it performed.

The operator of the jammer got a dollar per 1000 feet loaded. He would have to pay for fuel and tires for the jammer. A three-man crew was involved. There was the operator, a man hooking logs in the bush, and one unhooking by the truck. At noon, they would switch jobs to break the monotony.

Trucks appeared in this area around the 1920's. They were used before cats came into use to transport lumber, poles and other things. SJ McDonald was the first owner of a truck in the Salmo area at that time. His larger than average operation was in the Lost Creek drainage. It eventually went broke. He had four trucks. Two of them were Federals, one was a Kelly-Springfield, and one was a Leland. The Leland was the only truck

that had a cab. In the other trucks, the driver was exposed to the weather. The Federals were capable of hauling 4500 board feet. The Kelly Springfield took 5500 board feet, and the Leland hauled 7500 board feet. The trucks had solid rubber tires. All of them had gears, which made them very slow. They were so slow that kids could run up from behind the driver to tell him he was holding up traffic on the road. Bernard Feeney would only make three trips a day from Rosebud Lake to Salmo in the Federal truck. S.J. McDonald would also haul lumber made from a mill on Mountain Station and take it to Salmo to be loaded onto the train. On a down slope they were not always reliable. If you had to stop going downhill, you had to put it in low gear and pray. Truck drivers like Bernard Feeney and Doug Gibbon had to be skilled because of fewer gears, poorer brakes, and tighter roads. Owners mostly had to repair their own trucks but Caddy Donaldson had a garage in Salmo. He had a livery stable before trucks came into use. His garage opened before the turn of the century. It was where the empty lot is across from the West Kootenay Power station on 4th Street. A load of logs was attached to the truck by chains. Because the early trucks had no stakes on the side for support, the corner bind method was used. The first log on the truck was securely attached with the other logs added on from it.

In the early times, sawmills had their own logging crews. The loggers and sawmill operators lived in camps. Now there are independent logging contractors that work for a sawmill company. Today, logging is done more in higher elevations where the climate for growing big trees is not as good because of the harsher climate.

In the 1920's, there were many small sawmills in the Salmo area. It was a good idea to saw the logs on site because round logs were heavy and awkward. They did not have the technology that would allow for easy movement of logs to a central site. Some were portable but most were stationary mills. There were not too many big mills in the area. They were mostly steam powered by boilers. Steam powered sawmills were fuelled by wood waste from the saw operations. They were quieter than gas powered operations. This waste wood consisted of bark and sawdust that was called hog fuel. Steam power eventually phased out in the 1940's. Engines were converted to diesel. Diesel was a cheaper fuel than gasoline but was considerably noisier. Diesel was very efficient for portable mills. After the building of the dams, electricity eventually replaced diesel. Electricity was a relief for the operators because it was much easier on the ears. It ran even more quietly than steam engines.

In later years, most of the portable sawmills had gas engines. Portables were small mills that could be disassembled and moved in a short time. They produced around 25 to 30 thousand board feet per day. In the Lost Creek mill, which was one of the larger sawmills with a faster carriage, 45 to 55 thousand board feet of lumber was produced in a day. A good sawmill would turn out 50,000 board feet per day before WWII. A portable sawmill had an average of five workers on site. The jobs included a sawyer, dogger, setter, and a man turning cants. Fred Dory was a fast sawyer in the Salmo area. The setter was able to grade the log after the first cut. He could see how the grain was to get good clear lumber from the first cut. There was usually a high accident rate with small mills. Workers got shorter hours, better job security, better pay, and benefits in centralized larger mills. This brought more people into bigger communities. The logs were turned on the carriage by hand, using dogs and peaveys. Big mills today grade logs using lasers.

If the saw blade wiggled, this indicated the saw was not as effective. They would replace the teeth and throw out the old ones. Once on the blade, a set of teeth would last up to a week. The sawyer would usually file the teeth every two and a half hours. More filing would need to be done if the logs were dirty from skidding on bare ground; therefore, they would try to wash them in a pond or hose them off. Breakdown of a single piece of equipment on the sawmill could stop the whole crew from working. After the log was sawed on the carriage, the board went to the edger. From the edger, it went to the trimmer for the final stage. Now it was ready for the lumberyard in Salmo.





Bernard Feeney and his four horse team crossing the Salmo River on the original 1900 foot long bridge leading to Little Italy — circa 1911. PHOTO COURTESY OF BERNARINE STEDILE

LOGGING COMPANIES

The Feeney's had their sawmill at Airport Hill. They did their logging in Half-way Creek. It had a sawmill and planer mill. They supplied the timber and built the 1900 feet long bridge across the swamp and river at Salmo. They sold poles to Nowells and Carney from Spokane and shipped fence posts to the Prairies.

In 1910, William Feeney built the first sawmill that had a carriage with a fluid drive. John Bell invented the fluid drive transmission on the carriage. The mill had a steam boiler that was fed by wood waste.

Bell was popular for building sawmills in the area. The United States was his original home before moving to Nelson. He was the actual man who perfected the knotter on the McCormick Reaper. The device bound sheaves of wheat together and revolutionized the agriculture industry in North America. Bell never got credit for it because his brother-in-law, McCormick, patented it in his own name. The mill had a steam boiler that was fed by wood waste.

While installing the mill, Bernard Feeney was crushed by the 8-ton boiler. It tipped over while they were moving it and it fell on him. The 18-year-old was tough, though. They thought he would die but he was still breathing. They got him on a wagon and put him on a train to Nelson. He spent six months in the hospital. He was so weak he needed assistance to get onto a train to California. He returned after three years much improved, but he was plagued by this severe injury for the rest of his life.

Jack Feeney, brother of Bill Feeney, had a homestead at the bottom of Lost Creek at the turn of the century. He was the first to harvest in the drainage.

There was a shingle mill in Salmo where the high school and seniors' Villa are now. The mill and yard took up that whole area. The Kootenay Cedar Company employed many people in Salmo. Most were Japanese people imported to work in Salmo. It opened near the beginning of the century. At one time, they had 28 saws running. It was the largest shingle mill in Canada. Most of their wood came from Burnt Flats, site of the Kootenay Stone Centre today. Teams of six horses hauled the logs to where the golfport is situated. It was then loaded onto a mini railway that led to the mill in Salmo.

The Kelly family had a successful sawmill near Rosebud Lake. There were huge cedars in and near the lakeside swamp. The portable mill ran for quite a few years on the Rosebud Lake site. A plank road was built across the swamp in order to transport the timber. When the trees were taken out, the swamp eventually dried up. Kelly also harvested out of Lost Creek.

SJ Macdonald ran a larger than average sawmill in Lost Creek too. He had the first trucks in the area. At one time, he owned four. He logged for white pine that was cut to size to be chopped into match blocks. He sent it to the match block factory in Nelson. Eventually, he went broke.

WW Powell ran a mill in Lost Creek. They logged only white pine to make match planks. The other tree species were left unharvested. Burt Whistle put his mill in Lost Creek in late 1923. It ran there until 1925 and sat until moved in 1930. The operation in Lost Creek had a good edgerman named Jim Hess in the 1920's. In that year, he took his mill out of Lost Creek and sold it to KFP in Nelson, where it ran for many years.

Renwicks logged in Erie Creek. They had some of the finest horses around.

Jacobs built a flume system in Boulder Creek. The sawmill needed 60 thousand board feet per day. It had gunshot feed, steam loaders and niggers.

Archibald had a strong hold in the forestry industry in the area. He owned three mills. Two of the mills were at Salmo and Ymir. The other one was a small mill in Erie Creek.

Porto Rico Lumber Company thrived in the early years because of the construction in the area. They supplied a retail outlet in the booming towns of Nelson and Rossland. The Lambert's started it in 1900's.

Beach Campbell owned the South Fork sawmill. It survived the huge 1934 fire that started in Nelway, which consumed the whole Salmo River Valley and just missed the town.

In 1942, Cliff Hearn ran a portable sawmill by Reeves Lake near Nelway. Afterwards Cliff and Willy Hearn started a mill in McCormick Creek. They worked on Reeves MacDonald's mining claims in the Pend d'Oreille. For that operation, they needed a second sawmill. By 1947, his other brothers Willie, Howie, and Eddie were involved in the business. They had followed the path of their father who made fence posts during the war.

The Hearn's went through many expansion moves. One expansion move, in 1955, was the beginning of the present Atco planer site. They sold 80 foot cedar poles to B.J. Carney in the States, whose headquarters was in Spokane. They owned a sawmill in the South Fork area. Beach and Campbell were involved. They fed the cedar pole and post and the white pine industries. WW Powell bought the white pine from them. All the lumber that was produced stayed in the local retail markets. This mill operated for several years but ran out of timber. Eventually, the Hearn's established a permanent sawmill and planer operation at Park Siding, after buying Hilco Logging. From 1947 to 1977, the Hearn's and Rotter's were dominant in the area. Rotter was bigger immediately after the war, but Hearn's gradually grew larger. Atco Lumber Ltd. of Fruitvale bought the Hearn's sawmill in 1976.

Beach Campbell was involved with several logging and sawmill operations. He was best known for supplying the Reno mine in Sheep Creek with timbers. In his later years, he worked with Jim Hearn on a few little operations.

Rotter sold shingles to George Lambert in Nelson around 1908. Frank Rotter moved to BC from Washington State in 1926. He logged in Hidden Creek before the war. It was a small operation in tough times. Frank Rotter got his first big start by salvaging lumber from the fire in 1934. He purchased a portable sawmill from the Christian Community of Doukhobors in 1937. He set up the large sized mill in Sheep Creek in 1937. It had one of the first kilns in the area. He sold spruce logs to a pulp mill in Spokane. His operation peaked in 1945 while selling lumber to markets in the eastern States. Idaho Forest Productions Ltd. bought his mill in 1974. He had labour trouble. The radical members of the Doukhobor culture threatened to burn his sawmill. This was probably because he had many working for him. Rotter employed guards to prevent arson. For some reason, the Hearn's did not have the same problems.



DEMANDS

In 1884, the Salmo area was occupied mostly by prospectors and trappers. Some of them were not experienced woodsmen or trained prospectors. They were just farmers and storekeepers that had heard of the gold in the area that could make them rich. These people would bring a tent or a tarp for a place to stay. They had no immediate plans to built permanent structures. The main purpose of the earlier structures was to keep animals and weather out. There were no sawmills around yet to make lumber for houses. They made cedar boards with a wedge or an axe and a hammer called “lagging.” Six-foot shakes made the walls and roofs. In some instances they were not nailed together. A piece of wire was threaded through holes drilled into the boards. Skinned poles tied vertically were also a common material used to build cabins. This method was used more in higher elevations where large timbers weren’t available. Once the mineral potential was realized, people began to have a reason to process wood. Now there was a demand for products made by the forest industry.

Over the years, the demand for wood products changed for the area. The great demand for timber in the late 1800’s because of expanding industries like mining and railroads, was the first wave of demand. Towns were expanding fast. Railroads required large amounts of timber. Next was the prairie market. There was an agriculture boom at the turn of the century. Fence posts were shipped from here in huge numbers, lumber was a frequently used material that the region had in plentiful supply. Then in the early 1930’s, the introduction of electricity triggered a demand for poles. The pulp and paper industry in the 1950’s changed the forest industry again.



FIRST DEMANDS

Development of communities like Nelson and Ymir boomed in the late 1800’s and early 1900’s. Rapidly expanding mining activities in the area caused these towns to grow. The material of choice for buildings was wood. Bridges, stores, houses, mines and other construction were reasons why the forest industry boomed. There were only a couple of brickyards in the area. Bricks were used for chimneys and to build a number of the houses in Nelson and were generally used in the high fire zones of towns.

The bakeries needed firewood to bake their bread. Firewood would be cut to four-foot lengths, then split, then shipped on a train from Salmo to Nelson. Larch, Douglas fir and sometimes birch were the tree species most commonly used.

Sawdust was an important substitute in the early days for coal. It was especially crucial during the Second World War when there was a shortage of fuel. At this time, coal was expensive and delivery was limited. Sawdust was cheap, available and effective for keeping homes warm and for cooking purposes.

The boom supported many shingle and sawmills in the Salmo area. A good supply of big clear cedar was found in the valley bottoms. The demand for cedar supported many shingle mills south of Salmo at one time.

Able-bodied men never had to worry about a job because every sawmill could give you a job in the 1920’s. It was common for boys at the age of fifteen to work in a sawmill or mine. Sometimes they would take correspondence courses in the camps where they worked because there was nothing else to do in the off time. When many smaller sawmills were running there were more jobs. Since bigger mills have taken over, fewer workers are required.

The early sawmills supplied the local markets exclusively. Companies, like the Porto Rico Lumber Company typically had contracts to produce the large number of ties for the expanding railway. This sawmill also had contracts with mining companies in the area. A lot of timber was used in the local mines to shore up (brace) the tunnels. The sawmills also supplied the local lumberyards. Wood was in such large demand because it had many uses. Plastic, metals, and aluminum have replaced many of the wood products that once dominated the market.



RAILROAD

In the Salmo area, the Great Northern Railroad was being built in 1893 and 1894. For one mile of railroad, 3000 ties were needed. Railroads had contracts with local sawmills for railroad ties and lumber for constructing bridges, tressels and freight sheds. Railroads also purchased fence posts for fencing right-of-ways.

Originally, ties were hacked or hewn by hand with axes. They were first cut to length by axe, crosscut saw or Swede saw. Hewing the tie to shape started roughly with a single-bitted poleaxe. A broad axe was then used to finish to process. It had a straight edge and an angled edge with a handle set off centre. Some people believe hand hewn ties had a longer life span compared to sawed ties because of a smoother surface that could better resist water penetration.



MINING

The mining industry depended greatly on the forest industry to have safe mine shafts and for productive work on rail lines. In the 1930's, 1000 board feet of timber were sold to Sheep Creek mines for \$15 a wagon load. They were made from sprags or trash trees. These trees would be considered large for today's standards. Supports made from thick timber prevented the soft tunnel walls and roofs from collapsing. Tracks supported by wood ties ran sometimes 88 miles through mines like the ones in Rossland. This lumber was usually made of larch. This is because the pithiness stood up to the moist underground. It was also cheaper because sawmills didn't want the larch lumber as much. It would splinter and was gummy, which created many problems with the saws.



SECOND DEMANDS

In the early part of the century, the pace of construction slowed in the area. The mining craze was not as heavy. This caused a transition from the local market to distant customers. The Prairies became British Columbia's greatest markets. Their expanding agricultural settlements caused a booming demand for forest products. The BC coast was a major supplier of this new market. Although closer, the West Kootenays was not able to be a major trader with the Prairies. The mountainous terrain was a limiting factor. With the completion of the Crows Nest Pass Line in 1898, the barriers were overcome. Now the Kootenays could be involved with the Prairie lumber trade. A.G. Lambert, a company in Nelson, focussed on this market. This was not positive in every aspect for the area. Trains could more readily import wood products manufactured from other communities; therefore, there was less manufacturing locally.

A Nelson Daily News article printed in 1923 described the next transition in detail. In 1917, 99% of the lumber produced in the East and West Kootenay was railed to the Prairies. It was more evenly distributed in 1922, as more markets opened. In that year, 45% (115 million board feet) went to the Prairies, 30% (75 million board feet) went to the United States, 18% (45 million board feet) went to Eastern Canada, and 6% (15 million board feet) was sold in BC. In 1932, sawmills earned \$16 for a thousand board feet.

Just after the First World War, some major sawmills in the area closed down because of a low in the boom and bust cycle of western agricultural settlement. Lumber prices in 1919 went down to \$7 or \$8 a thousand board feet. There was a timber shortage in the West Kootenay forests. This was because the technology at the time was a limiting factor. Horses could only get the timber in the valley bottoms because they couldn't pull logs up a steep slope. Trees in the valley bottoms were ideal because of the gentler slopes. They were generally older, and therefore larger, because they were less likely to be burned in a fire in the wetter areas.

POLES

Poles for telegraph and telephone lines were also a valuable product harvested in the Salmo River watershed. Telegraph lines came in with the railroad in the 1890's. Salmo had electricity in 1933.

A telegraph pole is a different class than BC Tel poles. Logging companies were either in the saw log or the pole business. This meant the quality trees would be sought after in the surrounding forests. Tens of thousands of cedar poles were taken out of this valley. That is why there is no significant stand left in the Salmo valley. The pole companies would selectively log an area for poles first. Sometimes a lumber outfit would come in after and log the rest.

Logging for poles was best done in May and June when the bark could easily be peeled off. Swedes were said to be the best pole makers. Men were paid per tree felled, limbed, and debarked. They used to fall the best trees for poles first, so that poorer quality trees couldn't be felled on and break them. You needed to be gentle falling cedar poles because they could break easily from the fall. Hauling the poles out with horses was a challenge. They were longer than lumber logs and therefore didn't fit through standing trees well.

Quality was important. Poles had to be straight, and have no catfaces or scars. The right dimensions were important too. Dimensions involved circumference and height. Poles would be 20 to 100 feet tall, at increments of 5 feet.

In the spring, potential poles were peeled by hand with a "spud," a straight pole with a sharp blade on the end. It was best to do it in the early season because of the extra moisture in the tree. The bark would slip off easier with the extra moisture. Pole peelers used to do it in the winter as well. This was not always best because sometimes it was hard to take the bark off when frozen. To peel a pole you would start at the top and work your way to the butt end of the pole. When you were done, the log would be turned a quarter of the way and peeled again. A 100-foot pole could be done in 30 minutes.

The poles then needed to be seasoned to properly treat them. Otherwise the moisture in the pole would repel the treatment. This was done by drying in the air. It took six weeks to season in the hot summer months. During a cold, damp summer, it took three months.

As technology expanded, poles were treated with creosote. In the early 1930's, they started treating the butt end of poles to protect against rot. Later, the process was expanded to treat the whole pole. Pentachlorophenol replaced creosote because it was cleaner.

Companies like Naugle Poles, Bell Poles, B.J. Carney Pole Company, and Nankin Pole and Post bought the skinned poles from logging companies. They would be shipped far away. Sometimes the valuable poles were shipped around the world.

Bell Pole Company was a private, independent, family affair started by M.J. Bell senior in 1909. It had no connection to the telephone service company. Now they are the largest cedar utility pole producers in North America. They also have a big interest in producing lodgepole pine poles. They established a large operation in Lumby in 1925. They had an outfit in Nakusp in the early part of the century. It employed up to 35 people right in town. Many more workers were involved with harvesting poles in the woods. The tree species of choice was originally cedar, then fir, and then lodgepole pine. Lodgepole became more popular as cedar became less available because of its abundance and the ease of working with it. Lodgepole pine was not sought after as a lumber species until the early 1970's.



THIRD DEMAND

After the WWII, the forestry industry experienced large growth. Lumber was needed for the baby boom generation. Construction grew in North America because of the rapidly increasing population. The effect was felt in this valley, as well as in other logging communities. The best years for sawmills were the late 1940's.

Sawmills used to exclusively supply local markets. After WW2, export sales rose. At this time, England was trying to rebuild mines and the many buildings that were destroyed during bombing raids. England then

developed a demand for pit props. Pit props were needed for supporting mine shafts. Lodgepole pine was cut to eight foot logs. The lumber was measured by the cord and shipped to Britain. This was an important market for landowners of dry areas. Lodgepole pine thrives on drier sites.

Small mills prospered until the accessible timber was exhausted. After that, the small mills had a more difficult time. It cost more to run a logging and sawmill operation. Demand for higher quality was one of the reasons. This meant sawmills needed more efficient and expensive equipment. Also, more sophisticated technology was needed to utilize more of the tree volume.

At this time, every sawmill had a quota that they were expected to log by the government. Larger companies bought the smaller mills that were struggling. The larger company could then use the new timber supply to meet its quota. By the late 1950's, there were considerably fewer small mills. This had a direct effect on Salmo. Economics opportunities were reduced in the area because of sawmill centralization. Atco became the closest large sawmill.



DEMAND FOR TREE SPECIES

For the first half of the 1900's, cedar and white pine were the main species harvested because of the high market demand for them. Cedar wood was a very important species of lumber in those days. It is very waterproof, light, easy to split, and grows very old and big. The natural oils in the wood allow it to stay sound after fifty years in the weather. It was abundant in low-lying areas, a perfect situation for early settlers. They were able to harvest the useful wood on sites that the technology at the time was able to handle. The cedar trees made fence posts, poles, lumber, shakes, shingles and a lot more.

Using cedar for shingles was ideal. Its light and waterproof qualities also made it a prime material for walls, roofs, shims and fire kindling. In more prosperous times it was sought after for its beautiful finishing properties. It was found in the local boats and homes. In the 1940's, you would get \$100 for a thousand board feet of cedar.

Cedar fence posts were a large export. They were salvaged from the logs that were fire-killed during the many fires of the 1930's. Four to seven-inch posts were made for around four to six cents a post. After the tree was felled, it was bucked to the height of the post. Then you would hammer wedges with a ten-pound hammer to split the log into fence posts. Before the advent of creosote, some were preserved by charring. Nature gave the idea of charring cedar to preserve it. Charred cedar logs take forever to decay on the forest floor.

White pine was and still is the most valuable wood harvested in our forests. It was considered the best wood in the world. Its branches grow in a ring around the main stem every year, branches do not grow in between these rings. This leaves no knots, therefore, clear wood along the stem. The poles and lumber are characteristically strong. There was not as much white pine blister rust to ruin a stand of valuable white pine timber as there is today.

Match blocks were a valuable product made from clear, high-grade white pine. Match blocks were sent east to be made into match sticks. Match planks were cut differently from lumber. Normally, lumber was cut to one or two inches. White pine was cut to two and an eighth inches. A block was the length of a match. A gangsaw cut the match planks to length. The match block sticks needed to be seasoned before they were shipped away by train. This was done by air drying. Little mills would stack white pine with spacers to dry it in their yards. This process was done in the Pend d'Oreille, Salmo, and Nelson.

The best quality white pine was made into match planks. Big logs were sawed into lumber as wide as the diameter of the log allowed, and 1-1/4 or 1-1/2 inches thick. It was dried for a year before it was sent to Eastern Canada and the United States. Used for pattern making and steelworks because of its quality, it was expensive lumber.

Companies like WW Powell in Nelson would buy most of the white pine from the small sawmills.

The Salmo watershed was a large supplier of white pine. WW Powell had a logging camp in Lost Creek. WW Powell operated in Nelson for forty years. The company got \$17 for 1000 board feet of lumber.

White pine factories included Eddy Match in Pembroke, Ontario, and Ohio Match. Most white pine went to Ontario or the US, not to the Prairies as cedar did. The wood was also exported to England and South America.

There was also a market for making furniture with the easy to work with wood. A crew of thirty women in Nelson cut knots, stain, bark, and wormholes out of the wood. This waste then was collected and sold for \$5 a truckload. It was used for cooking in summer in a wood stove because it burned quickly and didn't heat the house.

Cottonwood was undesired wood in the pioneer years although it was usually large, very plentiful and easy to access along river bottoms. Cottonwood is not a good lumber species. Its wood is semi-hard, heavy, and absorbs water, which makes it inappropriate for building structures. It does not make good firewood either. Falling cottonwoods are very dangerous because their heavy branches may only be supported by soft rotting wood. They also tend to form hollow centres. On the Nelson waterfront, they got rid of them because they were dangerous trees for a recreational area. Some of the branches could weigh up to three tons.

Cottonwood was a readily harvested tree species despite its poor lumber qualities. It was a very valuable finishing wood. It was fortunate that the shores of the Salmo River provided prime sites for cottonwoods to grow. The huge trees were four to six feet in diameter. A single nine-foot log could produce 1100 board feet. There sometimes were only three nine-foot logs to a truckload.

In Nelson, BC Veneer Works processed cottonwood logs into veneer from the late 1920's to the early 1950's. Veneer is a finishing lumber. It can be used to produce beautiful patterns. They ran out of logs in the area to process. It is still sought after on private properties by veneer factories.

Western hemlock was first considered a weed tree species. Its properties were first recognized by an outfit on the Coast. They sold hemlock under the name Alaska Pine because it was not marketable otherwise. Hemlock and cedar stands, until the 30's and 40's, were considered a nuisance because rotten centres would be found. It is dangerous to fall large trees with hollow centres. Many fallers have died or been injured because the tree fell or broke unexpectedly. Now hemlock is considered as one of the construction grade timbers, although not as structurally important as Douglas fir. Hemlock is valued for finishing and plywood as well.

Lodgepole pine was not recognized as a tree to be harvested until late 1960's, early 1970's. Before 1976, the tree was not really harvested. In the 1960's, they began to clearcut lodgepole pine stands. The reason involved the mountain pine beetle, which could infest lodgepole pine stands in a couple of years. The timber value in the forest would be lost after an epidemic. If beetles were going to infest a stand anyway, they would clearcut it. Lodgepole pine found a market before the 1960's. After the Second World War, there was a small market for pit props in England. They were used to support mineshafts when England was trying to expand its mining industry.



FIRE

Fire is a powerful and mysterious force. It can create great havoc or be important for life. Many dollars have been lost to the raging heat. It has consumed valuable timber in the forest in greedy amounts. People feel the need to control things. Fire proves that nature sometimes has its own mind set about what is going to happen. The presence of fire is a positive aspect needed for wildlife and their ecosystems to prosper. Biodiversity is directly improved by fire. By creating openings in the forest, vegetation production is enhanced because of the increased light conditions. These plant species are the ones ungulates depend on for food. When fire is suppressed on a site, trees dominate the battle for light. A reduced amount of browse species leads to less food for deer and elk.

When the white man started using the land here, he found fire a valuable tool for clearing. In the



Fred Feeney and Bernard Feeney, near Half-way Creek — circa 1910. PHOTO COURTESY OF BERNARINE STEDILE

1880's and 1890's, the thick forests were viewed as an impediment to prospecting and mine development. To solve this problem, extensive fires were set to clear off entire mountains. Trains were a hazard to the forest too. They easily started fires because of the cinders from their smokestacks and engines. Fires in those years had a major impact on the forest. We rarely see the same amount of impact on the forest today.

In 1884 and 1885, there were many big fires in the area. Some were natural but man-made fires became more frequent with the new mining interest. One example might be the huge fire around 1883 that may have been man-made. It went from Ainsworth, on Kootenay Lake, to Brilliant, which is where the dam is now.

It is believed that there was a big fire where Salmo is today before the white man inhabited it. It would have cleared all of the timber in the area. We can see this from pictures from around the turn of the century. The hillsides behind Salmo are bare.

The 1930's were a particularly dry time in the forests of BC. Unfortunately, the Salmo area was not immune to the increased fire hazard. Erie Creek had many fires in the drainage during this time. The south part of the Salmo River valley was hit particularly hard.

In 1934, the Department of Highways was clearing the highway right-of-way near Nelway. The brush piles were not supposed to be burned because there had been no rain since April. Somebody decided that the piles of waste needed to be burned anyhow. The fire was left alone to die out over the weekend. On July 21, it got away and proceeded to burn the whole valley. The fire burned up Sheep Creek, the South Fork, Lost Creek, and Hellroaring Creek. The fire reached the South Fork and Lost Creek by going over Rosebud Lake. The passenger train in Salmo was held up for days. Fortunately, it did not quite reach Salmo because the wind

changed direction when the fire was just out of town. The fire eventually stopped around Hellroaring Creek. It was so intense, chunks of bark two to three feet wide were seen flying through the air. In all, 100 square miles of land were burned.

Big cedar trees that were on Feeney's property were lost. Feeney's sued the government and won. The Feeney farm, still known as Stag Leap Park Ranch, was consumed as well. The Feeneys lost everything except for a couple of horses. They lost their cattle, pigs, chickens, machinery, barns and a new house. This was devastating because it happened during the Depression. The South Fork sawmill, owned by Beach Campbell, was saved from the flames. Joe Sutcliffe, with a pump and a forestry crew, kept the fire away from the mill. The steam pump used usually broke down everyday, but during the fire, it was running wide open for several days.

In the tough times of the 1930's, some men would work just for food to survive. They would usually make 25 cents an hour. Some guys would start forest fires just so they could get work. The forest service saw this as a problem so they sent out stake crews to catch them.

After the fires in the 30's, white pine and cedar logs that were singed and killed were salvaged. White pine was salvaged first because its value would greatly decrease if the wood turned blue from rotting. The Feeney family made \$6 a thousand board feet from this wood if delivered as sawlogs to the South Fork mill. The Feeneys were kept busy in the winters making cedar fence posts as well. For each post made, they would get two to six cents. In tougher times, they only got three cents. The fence posts were loaded on the rail cars in Salmo and were shipped to the Prairies.

Fire had a great impact on the lives of many people in the Salmo River Valley. There was a fire in Porcupine Creek when there was active logging going on. The fire moved up on the loggers really fast. They decided to jump in the flume to get away. The fire ended up cremating them. The flume may have been burned further down already, or the fire caught up to them.

A fire burned up Boulder Creek in the 1920's. It burned some of the logging camp there. Every camp raised pigs and or chickens because there was no practical way to preserve food. Some pigs died in the creek. The fire fighters on the fire drank the water and got typhoid. Most of them died. Bill Milburn was one of the lucky few that survived.

During a very hot summer in 1945, there was a large fire in Sheep Creek. For two weeks, 350 men had worked on the fire to try to put it out. Most of the men were working in Wulf Creek. Packers were sent out with horses to bring food and supplies for the crews. Many of the men that were working on the fire were Doukhobors. There was a unanimous vote among them that if they were served meat they would stop working on the fire. This vote created a challenge. Because of the Doukhobors demands, a three-ton truck had to drive to Trail everyday to scrounge up canned tomatoes and other vegetables.

There was absolutely no rain for three weeks during the raging fire. By using just hand tools, they tried to head off the fire, but the wind would just blow it to another area. More area being burned meant a bigger need for men all the time. They used to take a truck to the Cominco gate to hire men to fight fire coming off their 3:00 shift. This was not popular with employers. Retired miners from Salmo also joined the effort. The fire gathered a lot of attention from the District Forester, his assistant, and the Nelson ranger. The crewmembers worked as many hours as they could stand. Some of the crewmembers would work two shifts for a maximum of sixteen hours a day. Finally a huge rainstorm came. Over three nights, the crew numbers dropped from 300 to 100 to 25. A crew of 25 patrolled the fire for a few days to make sure it was out.

During fire season, all forestry staff was expected to get involved. In the early days, no one was specifically assigned to fire suppression except for the high school students hired for the summer. They would be stationed at camps in the bush.

On spot fires, usually caused by lightning, crews were sent out by the Forest Service on foot because there were a lot less access roads. The Forest Service had crews of two men or crews of five young men to call upon to fight fresh fires. Crews of two or more experienced men were called smoke chasers. Today, they are called primary Initial Attack (IA) crews and consist of three men. Lookouts would give a bearing to where they saw smoke or lightning. Crews were driven to the fire on the closest road to it and dropped off. They

would have to hike to the fire from there. Sometimes the fires were hard to find, even with the lookout information. The drafts in some valleys would cause it to collect in the bottoms. They would sniff and listen to find the fire. There was competition to find fires between the smoke chaser crews.

In crews of five, sometimes three crewmembers would stay until the fire was totally out. The others were sent home early because the food had run out. The remaining members would have to depend on the forest for food. Grouse was a common choice. If the fire lasted more than a week, people were hired to work on the fire. The IA crew would be relieved on that fire. They would go back to camp and prepare for the next fire. In a two-man crew, if the fire were too large to contain, one man would go get another crew.

Forest fire fighting equipment was much more labour intensive. There were no luxuries for any person's job. Everything was transported by hand or horse. In the 1930's, the forest fire hand tools were pulaski, six-foot crosscut saws, shovels, mattocks and Indian (back pump) packs.

Mattocks have a thick handle with a blade for grubbing on one side and an axe blade on the other. They can be very efficient at breaking ground and chopping roots for making a fire line. The iron head can be removed from the handle to make it easier to transport. Pulaskis were once manufactured in Nelson at Nelson Iron Works. A pulaski is very similar to a mattock, but it has a skinnier handle and doesn't break down into two parts. Indian packs were 8 or 12-gallon containers with brass pumps mounted on top with a short piece of hose, through which water was pumped.

Horses were involved with fighting fires too. They pulled ploughs to make fireguards. They would expose the mineral soil so the fire had nothing on the ground to burn. Fire lines were one of the only ways to stop a fire from continuing. Sometimes this would not work on large fires. The fire would be so intense that it could jump over.

There was a lot less protective equipment for the men. In crown fires, hot needles would fall down and put holes in their shirts. Because they did not wear hardhats sometimes, their hair would be burnt. They had no portable radios with them at the time. If someone got hurt, medical help was a long distance away.

Crews were given a food package, which was called an iron ration. The food would last only three days. They were also given an axe, fire shovel, mattock, packboard, blanket, and a light ground sheet. This was called a lightning patrol kit. In the two man crews, each man would carry his iron rations, an axe, and a shovel or pulaski.

Communications equipment has been a very valuable tool for forest fire fighting and other forestry uses. Information about a fire or someone in trouble can be relayed to a fixed point when working in the bush. Work is more efficient also with a radio in such isolated conditions. The first technology used for communication in the forest was in the form of telephones. They were used in forestry and lookout camps.

Lookouts had landline telephones until radios were put in the towers around 1938. Telephone lines consisted of a single wire hung on standing trees to an office in town. In a forestry camp, a two-wire telephone system was used. They were all magnetophones. They had to be wound up, generating a bell signal current.

Radios eventually replaced high maintenance telephone lines. Radios operated on low frequency marine bands. Radios were more reliable and were not as restricted to certain locations. They began using them in the field in the 1930's, before the Second World War. Early radios were big, heavy and awkward. The ones taken into the bush weighed about 35 pounds. The mobile radios needed dry cell batteries. During the summer, they would replace the batteries about four times. There was always an extra pair of batteries on hand in the camp.

Radios used out of the office consisted of a 40-foot antenna wire, braided copper, porcelain insulator, and three or four feet of parachute cord tied to the end of the wire. To put up the antenna, they would throw the insulator and cord over a branch of a standing tree and it would drop over the other side. Then they would have to pull the antenna that was on the other side of the branch until the end was close to the branch. After that, they would create a slope from the antennae to the transmitter by walking away from the tree.

At a camp, they used a more permanent method. They would string a wire between two trees and put a drop wire in the center. The top wire had to be perfectly aligned for a certain transmission target.

You couldn't talk to Salmo from Kelly Mountain lookout with a radio because the antenna was only efficient in the way it was pointing. It was not possible to talk directly to Nelson from Kelly Creek because of the terrain. You had to talk to Hooknose, which was a forestry lookout in the States that could pick up the signal. They would relay to the Western Canada air and weather station on Old Glory Mountain in Rossland. They could then pass on the message to Nelson.

For forest fire use, radios were mostly used for the morning report. Every morning there was a roundup call for all of the lookout posts. At 6:30 to 7:00, information about fire reports and the previous day's weather would be exchanged. They would usually use a phone and relay messages during the day. To get peoples' attention about a fire, they would turn on the transmitter and bang a piece of crowbar on another hunk of iron.

Beaver Mountain lookout had to be rebuilt because of a lightning strike. They used to build the lookouts out of logs and lumber that could be scrounged. Packhorses would be needed to bring the supplies up. When they rebuilt it, they used cinder blocks. They were lighter than cement, which allowed helicopters to bring the supplies up. The helicopter brought up cement, cinder blocks, lumber, and plywood. This took ten hours of flying time. It would have taken a string of four packhorses a week to take in the same supplies.

Lookout posts seem to present a perfect opportunity for lightning strikes. They are built on the higher peaks to get a good view of many valleys. Since this is the path of least resistance for a lightning strike, it means trouble. When a bad storm was emerging, the lookout man might get nervous. He could either get in a pre-dug hole in the ground or leave the area all together. Lightning arrestor systems were designed to prevent the lookout and the people inside from being damaged. It seemed to attract more lightning than it repelled.

Aircraft are very effective tools in fighting a forest fire. They can do the work of many men in a matter of seconds. The first use of aircraft in the area was in 1928 in Nelson. Most airplanes had float pontoons until the 1960's. The method of scooping water with a "bucket" suspended from an aircraft and pumping it on a forest fire was developed right here in the West Kootenay.

It was cheaper to hire local aircraft under contract. The Gypsy Moth was piloted by Colonel Ted Dobbin to spot fires after a lightning storm. An observer like Percy Young was brought along.

Aircraft were not used from 1932 to 1945, during the Depression and World War Two. After 1945, young men with experience from the war became involved with the Forest Service. They took on the job of dropping food and supplies to timber cruising and fire fighting crews way out in the forest. Men would push supplies out of the planes through the trap doors. The pilot would say when to push it out. The person pushing the packages out of the plane had to be strong. Some packages weighed 60-110 pounds. Supply packages were put into canvas bags made of old tent material. The parachute was packed into the bag very carefully so that it would open properly.

Helicopters were first used in the late 1950's to battle forest fires. They proved to be more effective than fixed wing aircraft because they could fly to an exact spot and stop. Ropes could be swung from them to drop water on fires or to bring in supplies. Now a plane did not have to drop supplies with a parachute. Supplies dropped from a helicopter were unlikely to be lost in the trees. The first helicopters were G-1's, G-2's, and Hiller 12-E's. They could gain lots of altitude but they had load limitations. It was quite a few years before light-turbine powered helicopters were introduced.

Helipads were built in spots where they thought they were needed. This is because helicopters were ideal for fast response to a fire in remote locations. Experienced men could now reconnaissance a fire for position and intensity, saving a lot of time and timber. Helicopters were also capable of dropping buckets of water on a fire.



A LOOK AT THE
NELSON AND FORT SHEPPARD
RAILWAY

PREPARED BY:

Trevor Rushka

Salmo Watershed Assessment Youth Team



Freight Shed — Salmo. PHOTO COURTESY OF THE SALMO MUSEUM



*The heat became very intense and in his near delirium the young man saw a line cut through the forest.
It stretched as far as the eye could see and zig-zagged this way and that.*

*Hundreds of people, horses and Indians like himself followed this harrowing trail, packing endless
amounts of goods and supplies.*

*From behind them came an unfamiliar yet awesome sound. To the young warrior it sounded like creatures
from the spirit world waging war, and he began to smell it's blackened breath. The entire
landscape appeared to shift and make way for the giant snake-like creature and its piercing call.*





THE STORY OF THE BUILDING OF THE NELSON TO FORT SHEPPARD RAILWAY (N&FS) THROUGH SALMO is a tale of struggle for control of trade and of the tenacity of dreams. Years before the railway was laid through the area, the region was trafficked by only a few local Indians, trappers and prospectors. During the late 1800's, this isolation started to fade because of competition between two rival nations, Canada and the United States, for control over regional trade. This rivalry was partly manifested in the expansion efforts of rail companies, the Canadian Pacific Railway (CPR) and the Spokane Falls and Northern (SF&N).

For the prospectors exploring the numerous valleys and mountains of the West Kootenays, the region contained much potential for economic gain. Numerous mines were developed throughout the area in the 1880's and 1890's, with Nelson and Rossland serving as centres of activity. In order to make ore recovery more profitable, it became necessary to further develop and improve the local transportation infrastructure. At the time, only the communities along the Kootenay and Columbia Rivers had access to railways and steamboats. Since mining communities were springing up in increasingly isolated places, the push for infrastructure expansion became increasingly strong.

The Canadian and American construction of railroads simultaneously peaked between late 1888 and early 1900. At that time, the president of the CPR, William Van Horne, was faced with a number of challenges. He needed to complete his company's mainline to the Pacific while increasing revenue in order to cover the costs of year round operation. To earn more money, the CPR needed to expand into an area that could guarantee increased traffic. Because of its mining boom, the West Kootenay area was targeted. The most direct routes through the area were either by the CPR's main route, which followed the Columbia River to Revelstoke, or by rail and steamboat from Spokane (then Spokane Falls), Washington or Bonners Ferry, Idaho.

Realizing the increasing value of the region, CPR and SF&N both worked to increase their local presence. The CPR did this in part by constructing a line in 1890-1891 that followed the Kootenay River from its confluence with the Columbia River to Kootenay Lake ("from nowhere to nowhere," as William Van Horne described it). This seemingly insignificant track was, however, essential to the CPR in order to increase its share in traffic to and from the Kootenays. Previously, the stretch had been accessed by forty-five kilometers of rough wagon road which bypassed a long series of rapids and falls. Travel had been very time-consuming and costly.

The steamboats which operated on Kootenay Lake provided a second source of competition to the CPR. The boats could operate as far south as Bonner's Ferry, Idaho, and had considerable business in shipping goods and passengers to and from the United States.

Despite the strong expansionist tendencies of the Americans, it wasn't until 1888 that US companies could commence development in Canada. It was in that year that a twenty-year contract between the CPR and the Canadian government which prohibited the government from authorizing charter rights south of CPR's main stem finally expired. This change allowed the Canadian government to permit other rail companies to compete against the CPR. The monopoly that the CPR had maintained under the contract had, however, given the railway a head start in gaining a strong hold on business.

The SF&N Railway was one company that was determined to take advantage of the expired contract and expand north along the Columbia River and into the Kootenays. In order to accomplish its goal, the company contracted a highly skilled and ambitious American by the name of Daniel Chase Corbin.

Corbin accepted the work for two reasons. He knew that the existing combined rail and steamboat route could not handle a large tonnage of freight as well as a railway could. One reason for this was that, unlike steamers, trains could continue operations during the winter months when rivers froze over. Furthermore, Corbin saw the project as an opportunity to start fulfilling his broader ambitions to penetrate southeastern British Columbia and secure access to the trade routes from Victoria and Vancouver. Within a year, Corbin had his surveyors plan a route to the international border, this progress was noted in the Annual Report of the Spokane Falls Board of Trade in 1889.

“Mr. Corbin has already taken steps to make extensions of his system which will ultimately end in giving Spokane Falls direct railroad communication with the Canadian Pacific, and in opening up the immense mining regions which lie to the east, north and west.”

With the possibility of an American company entering into the ore shipping business, the Canadian government had to create a business climate that could prevent the ore from being transported to American smelters. Since most of the miners in the Kootenays were of American descent, support for Corbin’s proposed development was strong. If Corbin constructed a railway to Nelson, the ore that might have been shipped elsewhere by wagon and steamer would be transported to Spokane Falls, and would help to build the town into a smelting centre.

Corbin was considered to be a threat to Canadian trade by the BC government in Victoria. Both British and Canadian investors spent significant time and money in efforts to prevent American competition with Canadian rail companies. Ottawa’s British Columbian representative, John A. Mara, expressed Canadian fears of American expansion.

“The cost of transporting ore from Toad Mountain to Helena, Montana, is, at present, \$33.00 per ton. With a good road to Sproat’s Landing and large steamers on the Columbia River, ore can be transported to Revelstoke for one-half that figure, leaving a good margin in favor of the mine owner. Mr. Corbin, president of the Spokane and Northern R.R. Co., has engineers exploring for a route from the Columbia to Kootenay Lake, via Salmon River and Cottonwood Creek, with every prospect of securing a good line. Their line will be completed to Dalles by next spring and unless an effort is made by the provincial government and the CPR Co., the holders of the present charter, the trade of the district will surely drift to Spokane Falls.”

In December, 1889, Corbin petitioned British Columbia for two railway charters. One was to target Nelson, commencing at the confluence of the Pend d’Oreille and Columbia Rivers; the second was to extend westward from the Kettle River valley to the mouth of the Fraser River. A line running to the coast from the south end of Kootenay Lake would allow mining communities to access the lower mainland’s trade markets.

Corbin’s proposal to open the Kootenay market was rejected by the Canadian government, since it was more interested in the portion of the contract intended was to connect Nelson to the coastline, not the part that sought to develop American markets. The BC government, which had approved the charter, suggested, in an effort to facilitate the development, that Corbin purchase the Crow’s Nest Coal and Kootenay Railway Company’s charter from the Crow’s Nest Coal and Mineral Company.

John A. Mara played a key role in Ottawa’s opposition to Corbin’s charter. With other members of the Canadian Parliament agreeing that Corbin’s line “...would transfer the whole traffic from the rich Kootenay district to the United States, whereas the object of the Parliament should be to build up cities in British Columbia...,” Ottawa’s opposition to the project was strong enough to force its rejection.

On the same day that Ottawa rejected Corbin’s proposal, a telegram was received from William Van Horne, stating his intent to extend development into the Kootenay area via the waterways and Revelstoke. Since Corbin’s original idea of extending into the Kootenay’s and connecting the SF&N railroad to the CPR’s routes via land had been thwarted, Corbin was forced to seek an alternate route. During the winter of 1889, his crews held camp, waiting for the snow to melt and for a decision to be made. Finally, Corbin declared, “We will build this spring to the Little Dalles!,” a town located fifteen miles from the Canadian border.

On May 3rd, 1890, the Spokane Falls Review announced:

“The contractors for the Spokane Falls & Northern extension to the Little Dalles have nearly completed their work. The grading is largely finished, the trestles built, and as the recently invented machine does the track lying, it is thought the trains will be running through to the Little Dalles by June 15.”

Corbin fulfilled his promise of connecting the SF&N Railway to the steamers between Little Dalles and Revelstoke by August 12, so he then negotiated with the Columbia and Kootenay Steam Navigation Company (C&KSN) for the use of their newest sternwheeler, the Lytton. At last, the SF&N line was able to access the CPR’s routes. Despite contracting their services out to Corbin, the C&KSN Company’s main goal was to maintain Canadian control in the Kootenay region.

Once the deal had been struck between C&KSN Company and SF&N Railroad, Corbin had finally fulfilled his contract to establish a direct route between the United States and British Columbia's mines via the CPR. Corbin's accomplishments led him to be held in high esteem in the eyes of Spokane residents.

Corbin, however, was not satisfied, so he continued to try and establish an SF&N rail line into the Kootenays. He spent the next two years dispatching survey crews into the Kootenays to assess possible routes into the area. These explorations led to the development of the Nelson to Fort Sheppard railway, the railway that opened Canada to Corbin. The line ran from Fort Sheppard, which had been established by the Hudson's Bay Company in 1857 and burned down in 1890. In the beginning, the N&FS was supported by five British Columbian businessmen: Mr. Wright, one of the founders of Ainsworth Hot Springs, Charles Thomas Dupont, Peter Curran Dunley, Charles George Major, and Henry Slye Mason, owner of the Provincial Museum in Victoria. These men believed that their personal, and the region's, prosperity could be increased through unification and exploitation of the Kootenay region.

By February 6, 1891, the Nelson to Fort Sheppard was chartered without a subsidy from the British Columbian legislature. Many Kootenay residents, both Canadian and American, supported Corbin and felt that by playing up the threat of American control, the CPR would be forced to extend their tracks into southeastern British Columbia.

In 1891, the CPR announced that it would apply for a charter to build a line from the Crow's Nest Pass to the Coast. Their rationalization was that, the growing trade with China and Japan, and the desire to reach the rich mining region in south British Columbia... necessitated this alternative route."

In 1892, the Nelson to Fort Sheppard line was granted a subsidy of 10,240 acres of public land for each mile of railway completed, a deal that eventually delivered Corbin between 580,000 and 614,000 acres. A guarantee that the area chartered by the railway would be exempt from taxation for a period of ten years was also obtained from the BC government. Victoria clearly felt that it was receiving a good deal, since it was stated that the land granted was close to worthless because only "one acre in a thousand" could be used for agricultural purposes.

Once he had received endorsement from the BC government, Corbin had to seek authorization to proceed from Ottawa. Ironically, John Mara, who had opposed Corbin's first effort to access Canadian markets, strongly supported his second attempt. He argued that giving businesses the opportunity to transport goods by rail, as well as ship, would give Canadian businesses greater economic control in the region. Mara argued that the CPR's route from the Crow's Nest would not access this region for at least two more years, a duration the Kootenays couldn't wait out. There remained, however, the perceived threat that allowing an American railroad into the Kootenays would lead to a loss of Canadian control of Kootenay trade. Mara's response was that the new railroad did not pose "the slightest possibility of losing the trade in Kootenay country." After much debate, Ottawa still felt uncomfortable about authorizing possible American control in a region which had such strong economic potential. Instead, the parliamentary committee voted to postpone the Nelson to Fort Sheppard charter for one year with the hope that the CPR would build their line in that time. This only provided Corbin with the time he needed to send out two surveying parties that assessed alternative routes; as in his mind, the contract was already within his grasp.

The first route surveyed was along the east bank of the Columbia to Robson, then eastward to Nelson on a track parallel to that of CPR's Columbia and Kootenay. The other route left the Columbia north of the international border to follow the course of Beaver Creek easterly through Salmo and Ymir, onto Cottonwood-Smith Creek, and then around Toad Mountain and down into Nelson. Corbin's actual agreement with the Nelson to Fort Sheppard railway was quite similar to his contract with SF&N. Corbin would receive all assets of the line including its land grant, with the construction and equipment costs being his responsibility. He was also paid \$25,000 a mile in securities by the company. Corbin was, however, under considerable time pressures, for he was contractually obliged to have the line completed within one year's time. The track must be laid and ballasted to Nelson before the first snowfall, and in any case, not later than October 1st, excepting only the bridge that would span the Pend d'Oreille River near its junction with the Columbia.

By the time the federal government's one-year waiting period was over and the charter into Canada was his, Corbin had completed all the necessary surveys and planning. Construction commenced in May, 1892. The contractors started by attempting to clear and grade the route into Nelson, but, because of unpredictable weather and unstable land, crews were forced to wait until warmer weather approached. By the middle of June, crews were in full gear, and Roberts, one of Corbin's surveyors, had already laid tracks from Northport to the mouth of the Pend d'Oreille River. Under the supervision of Larson and Welches, the other surveying crews cleared south from Nelson. By June 26th, the railway had hired 800 men full time, and was continuously hiring more. Despite paying the workers at irregular intervals, fighting the growing hunger, and pushing off fatigue, Roberts was optimistic about the railway, and he clearly saw that if construction continued at the pace of two miles a day, tracks would enter Nelson by October 1st, 1892.

As the winter of approached, bids were submitted by seven contractors for the construction of the Pend d'Oreille River Bridge. The bid contract was won by a young representative of the Dominion Bridge Company, Hugh L. Copper, who achieved some local fame for constructing the unique, technologically advanced steel bridge referred to by Roberts as "Copper's Grasshopper." People throughout the region came to gawk at the bridge, which was said to be "apparently good for all time..." by the provincial inspector. Besides being a significant display of technology for the time, the Pend d'Oreille River Bridge also held the sharpest turn, twelve degrees, on the entire Nelson to Fort Sheppard route.

By July, 1893, the bridge was in its last stage of completion. Meanwhile, Roberts, who was in charge of the northern crews, started working northward from the border on July 16, 1893, at a rate of one mile per day. By early September, the track had come within twenty-five miles of Nelson. All idle men were summoned to help with the last stretch, and Nelson was reachable within a few weeks. By October 21, 1893, twelve miles remained and, the first snowfall had fallen. The pressure was on.

The Nelson to Fort Sheppard contract stated that the line had to be operable by the end of the year, but the line, to be considered so, had to be inspected and approved prior to being used by traffic. If this work wasn't completed by the end of December, Corbin would lose his land grant. In order to meet the schedule, Roberts decided to establish a temporary train depot at Five-Mile Point, near Nelson, to technically fulfill the agreement. The last few miles of the railway were laid in order to pass inspection, but nothing more, for they were to be torn up the following spring and relaid properly.

With the track as near to Nelson as the weather and the CPR would allow, the provincial inspection commenced. George A. Keefer was the engineer chosen for the job. Any flaws that were found increased the risk of Corbin's project being completed after the due date, causing him to lose his land grant. The inspector's final statement was positive, though, saying the line had been "admirably constructed." The railway was officially completed on December 14, 1893, only seventeen days before the contract expired.

The inspector then rode the line and was quoted as saying, "I have no hesitation in pronouncing the road as a good, workable, well-built railway, with an exceptionally smooth track." Roberts declared that the temporary depot at Five-Mile Point would be finished on December 19th, and the Nelson to Fort Sheppard would open for freight that day. On the appointed day, the Miner reported:

"The first train over the Nelson & Fort Sheppard arrived in from Spokane on Tuesday evening. It was expected the D.C. Corbin would accompany the first batch of passengers, and arrangements were made... for a rousing reception at the depot. The band was induced to turn, and half a dozen teams were waiting to take those averse to walking up the hillside to the depot. Before the train time, nearly every man in town was at the station."

As freight hauling commenced, the railway promptly published rates. Ore valued at not more than one hundred dollars a ton in carloads of 20,000 pounds or more could be shipped by boat from Kaslo, in the steamer "Slocan" to Nelson and by rail from Nelson to Tacoma at nine dollars a ton. The new line permitted much of the ore to be hauled south, sometimes to places as far away as the Selby smelter in San Francisco, or Montana.

Despite the prolonged battle to get the rail into Canada, the railway wasn't universally considered a



Salmo Train Station — circa 1912. PHOTO COURTESY OF THE SALMO MUSEUM

success. Its construction had been prolonged by several months, and the delays meant that the depot was located some distance outside of Nelson, making it difficult for the public, many of whom were bringing ore for shipment, to go to the station each morning. Consequently, the Nelson to Fort Sheppard experienced a poor first fiscal year. The line's only assets besides the railway itself were two locomotives it had purchased during its initial period of construction, and all of the freight and rail cars were borrowed from SF&N. June of 1894 only left the line with more problems, in the form of a quarter million dollars in repairs from flooding of the tributaries of the Columbia.

While the Nelson to Fort Sheppard did not end up with as much glory as Daniel C. Corbin might have desired, it did make the existence of several small mining communities, such as Erie, Ymir, Salmo, and Sheep Creek, more possible.

In 1896, after citizens and cities petitioned Victoria, the CPR finally consented to allow Corbin to construct a depot closer to Nelson, this time only one and three-tenths of a mile from town.

The Nelson to Fort Sheppard was sold to the Great Northern Railway at the end of 1944, and it merged with the Great Northern system in 1970. The BN Nelson line goes from Spokane, following the Columbia River across the international border upon reaching Kettle Falls. Once across the international line, the track then ascends to Apex by following the route of Beaver Creek and the Salmo River. When the track reaches the city limits of Nelson, it descends to the West Arm of Kootenay Lake at the Troup Junction. In 1900, the BN gained rights to run on CPR's track from Troup Junction to Nelson.

The Nelson to Fort Sheppard is 313.0 km or 194.5 miles long.

Thirty-four bridges and trestles exist between Waneta and Nelson, the oldest of which are between



Nelson – Fort Sheppard Railway at 5 Mile Point Nelson. PHOTO COURTESY OF THE SALMO MUSEUM

Salmo and Troup Junction, dating from 1949. Those between Columbia Gardens and Fruitvale date from 1954.

Thanks to the knowledge of Jim Hope, an avid train enthusiast residing in the Trail area, and Sjeng Derkx of the Nelson Area Trail Society, I have been informed about the railway's recent and current uses.

The Pend d'Oreille Bridge, once dubbed to be "apparently good for all time..." is still standing, though it is now used for automobile traffic, since BN has since built a new bridge for its trains.

BN railways has since sold the track to two different companies. The Sandner brothers, of Christina Lake, purchased the stretch between Salmo and Ross Spur A&K Railway Materials has bought the remaining half located between the Nelson's Troup Junction and Salmo (TJ&S). Both of these companies agreed to a similar contract that is described by Sjeng Derkx as, "a contract to own the railway materials and the right to run trains on that land."

To make good use of this agreement Sandner has bought a rebuilt GP-9 locomotive and still uses the line to transport lumber from Park Siding to Columbia Gardens, where BN acquires the freight.

A&K Railway Materials Company has salvaged their segment of track for resale to countries in South America and Asia.

Under the Canada Transportation Act, when railway land is abandoned, as in the case of the TJ&S section, the owners are obliged to grant the sales option to the government prior to making public offerings. The Nelson Area Trail Society has lobbied to the government for a year to purchase the abandoned reach and turn it into a recreational trail.



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THE DAM PROJECT
COME HELL OR HIGH WATER...

PREPARED BY:

Vernon Cox

Salmo Watershed Assessment Youth Team



Jim Hearn and John Waldbeser, salmon catch from
the Salmon (Salmo) River — circa 1903.

PHOTO COURTESY OF THE SALMO MUSEUM



His vision did not end there, but carried him for some time. The seasons changed and then changed again. The sound of rushing water resounded in his ears. He heard it in the form of raindrops falling near soundlessly on the forest floor. He heard the process of absorption through soil and rock and then its grainy passage through the underground. He heard what it is like for a deer to drink from an ephemeral pool.

He heard the raging Pend d'Oreille echoing through the limestone bluffs and slowly but surely heard it become tame. He had somehow foreseen the building of the great hydro-electric dams along the Kootenay, Pend d'Oreille, and Columbia Rivers.





COMMENT BY THE AUTHOR

The Salmo River watershed consists of a diverse group of waterways, wetlands and lakes, each with their own characteristics, and of course, their own habitats. Although at first it seems the Salmo is a pristine example of a valley river, very few of us realize that our river is heavily impacted by two others: the Pend d'Oreille and the mighty Columbia.

The Columbia River, once a fast flowing natural wonder, has now been slowed to a crawl, a testament to human development and progress. From Bonneville near the mouth, to Mica near the headwaters, a total of fourteen dams can be found crossing the massive Columbia. This is progress, some say, for we have tamed this natural giant and have become its master. Some say that this is not progress, but a detriment to fish habitats and other river life. Others have their own opinions.

Let them debate, I say. The presence of dams on our rivers is a reality, and I am writing this not to debate their presence, but rather to put forth factual information about the dams, their construction, and their sociological and environmental impact on the surrounding areas.



THE DAM REPORT WHY BACK WHEN....

In an effort to understand the motivations behind our frivolous construction of hydroelectric dams in this century, I will attempt to explain how we came to this mindset, with a short history lesson.



THE THREE PROBLEMS

In the first half of the century, a great amount of progress was made in industry. These growing industries were expanding rapidly and consequently, needed more and more power to run. After Rock Island, the first hydroelectric dam, was built on the Columbia in 1928, it was clear that industry had found its new source of energy.

Many dams gave farmers a helping hand as well. Agricultural land was limited by the simple fact that, where there was no water, crops couldn't grow. Back then, there was not a lot of access to irrigation equipment, but even so, water had to be piped great distances. The dams helped to solve this problem by giving the water pipes something to draw water from. A dammed up body of water provided a more consistent water source than a river did.

Dams were solving another major problem as well: unemployment. The construction of a dam was a huge project, taking many thousands of man-hours to complete, thus creating jobs for many men. Even at the low wages offered, any job was better than no job.



BLACK TUESDAY

The Great Depression. The "dirty thirties" is said to have been the worst decade of the century. The nineteen-thirties proved to be disastrous to the populations of North America and the world. During the twenties, after the First World War, the people of Canada and the United States prospered. For eleven years, the poverty level was reduced, the employment rate raised. Even Rock Island, Columbia River's first dam was constructed in 1928. Businessmen made fortunes playing the stock market. The stock prices continued to grow, making people more and more money. By the end of the decade, almost everyone had some shares in

the stock market. However, in a rush to make easy money, people made a horrible mistake.

Nearly everyone bought their stocks on margin, meaning that when they purchased their stocks, they purchased on credit. The intention was to back the credit when they sold their stocks (at a substantial profit!). The stock market had continued to climb throughout the twenties, with people purchasing more and more stocks on margin. This was their error.

The Wall Street stock market crash of 1929 reduced the world's economy to rubble. The worth of shares plummeted because there was no monetary base for the stocks. In a matter of minutes, wealthy businessmen lost their fortunes, and in despair, some threw themselves out of third or fourth story windows. People tried to sell their stocks, but the stock market had closed. Others tried to reclaim their wealth from the banks, but even the banks had played the stock market. The banks didn't have any money to give back to the people because they too had lost all of their money when the stock market crashed. Thus began the Great Depression.



THE GREAT DEPRESSION

The following years saw the entire world lapse into a state of despair. There was no money, no jobs, and no morale among the people. To make matters worse, a series of droughts plagued the land, making farms go out of business, and people starve. Many people lived in Hoovervilles, groups of shabby dwellings that people used for shelter. Those who couldn't find work usually took to wandering, hitching rides on trains and going wherever the engines might take them.



FDR

With the nation in a state of chaos and pain, the president at the time was quickly replaced with another man — Franklin Delano Roosevelt. He immediately closed the banks (he reopened them later after he had fixed their problems), and began creating reforms and work plans to try to combat the Depression. He created what was known as the “New Deal,” putting men to work and giving the homeless somewhere to live. Government projects were initiated in an attempt to put some people to work. One such project was to build a hydroelectric dam, the Grand Coulee, across the Columbia River. The project put hundreds of people to work for several years, each earning a decent wage (for the time). All around the dam site, several towns sprung up nearly overnight. It wasn't long before men flocked to the dam project, looking for work. Unfortunately, many men died working for the dam's completion.



THE DAM

This dam, the Grand Coulee, could not have been completed at a better time. Soon after construction began, the Second World War had erupted in Europe. It is estimated that about 96% of the electricity produced on the Columbia was used to fuel the war efforts in 1943. The electricity was used in several different ways, including the powering of ammunition factories and the secret Hanford base, where atomic experiments were being done. It was said that the Grand Coulee helped the Allies win the war.

After its completion in 1942, the Grand Coulee stood as the largest concrete structure on the face of the earth, a testament to the ingenuity of man. It was capable of producing over 10,000 MW of energy by itself. It held back Lake Roosevelt, its reservoir, a massive lake that measures over 100 miles long. In fact, in Trail, British Columbia, some 180 miles upstream of the Grand Coulee, you can still see how calm and restrained the Columbia is.

The construction of the Grand Coulee Dam helped solve the “three problems” mentioned in the first paragraph of this section. The Grand Coulee certainly provided those much needed jobs during the Depression, as well as helping to raise the morale of the population. The land around the dam, once arid and dry, could now be irrigated with reservoir water. In addition, as mentioned above, the Coulee had no problem meeting the power demands of the war or the growing industries around the area.



THE DOWNSIDE TO PROGRESS

Naturally, as with any project involving any environment, there was much opposition to the Grand Coulee. These opposing views were loudly spoken, but none could hear over the grinding rock and hammering of progress.

One New York newspaper said the Grand Coulee Dam project was a “cesspool of the New Deal,” probably reasoning that it was a way for the government to fund a project while paying for cheap labour. Since during the Depression any paying job was better than no job, employers got away with paying less than fair wages to their workers. One senator of Washington State in the 30’s was accused in newspaper accounts of trying to make money by purchasing land around the dam site.



Waneta Dam — circa 1954. PHOTO COURTESY OF COMINCO LTD., TRAIL OPERATIONS.

Due to the type of energy being produced, there was no way at the time to store any excess energy (and the Grand Coulee Dam was producing more than enough!), and critics argued that the excess energy would be wasted.

The environmental debate over the fate of the Columbia River was over before it ever began. There was no environmental review of the United States Army Corps of Engineers' (USACE, who were responsible for the construction of the majority of the power projects on the American part of the Columbia) plan, and since the Pacific Northwest was deep into the Depression, there was no question whether or not to develop the river.



OUR RIVERS (DAM IT!) WHY WE CARE...

Our location in the Salmo River watershed secures us in a pristine valley, about thirty miles away from the Columbia River. Why talk about the Columbia so much then? Our river, the Salmo, at the lowest part of our valley, flows into the Pend d'Oreille River, that originates in the states. The Pend d'Oreille flows for about twenty-five miles, flowing through both the Seven Mile and Waneta Dams before joining with the Columbia River, just north of the US-Canada border crossing near Waneta. So, just as Erie Creek is part of the Salmo River watershed, the Salmo is part of the Pend d'Oreille River watershed, and both are part of the Columbia River watershed. It is for that reason why we are concerning ourselves with the Columbia.



WHERE WE ARE DAMMED

Even though we are influenced by the Columbia River, we do not need to concern ourselves with dams that are: upstream of Trail, British Columbia (water flows down; what happens upstream of where our river enters the Columbia is of concern, but not as important as other dams); and dams on other tributaries of the Columbia Basin. The dams that affect us as residents of Salmo and Ymir are: Bonneville, The Dalles, John Day, McNary, Priest Rapids, Wanapum, Rock Island, Rocky Reach, Wells, Chief Joseph, Grand Coulee, Waneta, Seven Mile and Boundary. If you care to know the specifics of these dams, check out Appendix A, at the back of this report. There you will find the date of construction, specs, and other pertinent information on the dams.



OUR FRIENDS, THE FISH

Up until the mid-twenties, fish of all kinds could be found, in numerous population, all over the Columbia Basin. Nowadays, we are lucky to have a river without a fish problem. The dams are said to have been a major contributing factor to this problem. There are several reasons for this. Since a dam is a barricading structure across an entire river, it doesn't leave anywhere for migrating fish to go. Fish ladders have been an answer to this problem, but some dams don't even have them. When the Grand Coulee was built, there was no fish ladder, and an entire population of chinook salmon, fish that can weigh up to eighty pounds, were wiped out by the dam's turbines. The steelhead trout, one of the world's most sought after sportfish, has dwindled in numbers to near extinction.

Dams work like giant filters, holding back the natural nutrients behind the dam and eventually settling them to the floor of the river. The downstream water bodies then become so deprived of nutrients that fish populations there, if existent, die out. Fortunately, BC Hydro has been a constant funder of compensation programs. Some projects, like the one on Kootenay Lake, are working to put artificial fertilizers in the lake to help the fish grow strong and healthy, because the fish that have grown there have declined in size and number



Fishing on the Salmon (Salmo) River — circa early 1900's. PHOTO COURTESY OF THE TRAIL CITY ARCHIVES

since the dams were built. There are of course, exceptions, like the white sturgeon. White sturgeon live to be about 150 years old, and were abundant all through the Basin before the dams were built. Even now, the sturgeon can be found in good numbers in some areas. However, the dams have rendered spawning ineffective, so for the most part, only the older and larger fish are left.

Fish also have a very sensitive temperature tolerance when it comes to their water. For example, rainbow trout like a temperature of approximately 14 degrees centigrade, and can tolerate up to about 20 degrees before they start being stressed. In and around 25 degrees, these fish start to die. Unfortunately, the temperature of the water coming out of some dams can be as much as 15 degrees higher it was than when it entered the dam. Reservoirs also cause the water to heat up because the water contained behind a dam is sitting in the sun, getting hotter and hotter. Another contributing factor to the temperature of water is availability of shade. Everyone knows that if you stand out in the sun, it will be hotter than if you stand in the shade. The same is true for water. If there are overhanging branches or treetops, or any other way to block the sun, the water temperature will be cooler.



WHAT IS A DAM BACK TO THE PRESENT (FUTURE?)

WHAT EXACTLY IS A DAM?

A dam is a barricade across a river,; built to serve a number of purposes. Two of the most common purposes are flood control and electricity production. Many dams are built to handle both flood control and to generate power, but some, like the Hugh Keenleyside, west of Castlegar were built only for flood control. The Columbia Power Corporation is presently installing generators, upgrading this dam from flood control to include power production. All dams bring with them benefits and detriments, both of which will be discussed further in this document.



COLUMBIA RIVER DEVELOPMENT TREATY

In September of 1964, at Peace Arch Park along the border of Washington State and British Columbia, a treaty was signed to formalize the “largest international resources agreement” between Canada and the United States of America. It was called the Columbia River Development Treaty.

This treaty called for a cheque from the Americans, worth approximately a quarter of a billion dollars, to be given to the province of British Columbia. This was payment for the benefits reaped from three dams that were to be built in BC: the Hugh Keenleyside Dam, just outside of Castlegar, the Mica Dam, north of Revelstoke, both to be built on the Columbia, and the Duncan Dam, to be built on the Kootenay River. The Americans were purchasing, to be specific, half the power produced by these three potential dams over the next thirty years, and Canada was being paid in advance. No one could foresee the changes this project would make in the Columbia River Basin during the next three decades.



BENEFITS

From between the the years of 1964 and 1974, the three dams were built, the Duncan in 1968, the Hugh Keenleyside in 1969, and the Mica in 1973. (Also of note, although a US located project, the Libby Dam, in Montana, produced a reservoir that extended approximately 60 kilometers into BC. The Canadian area of the Columbia River Basin now provided British Columbia with 50% of all the electric power generated in the province. The new Mica Dam produced about one-fifth of BC’s electric power!

There were massive power benefits from the Mica Dam project, mainly because of its location. As put forth in the Columbia Basin Trust video, one hundred kilometers downstream, the same water that produced energy at the Mica Dam now is going through another set of turbines at the Revelstoke Dam — and this continues all the way down the Columbia River, passing 13 or 14 dams! The same water produces energy at each of these dams, providing an efficient use of resources. Also, the benefits of a headwater dam (such as the Mica) are excellent for use in flood control, for which the Americans were also paying BC.



RESERVOIRS

A “reservoir” is the term given the body of water behind a dam. The water stored behind a dam in this fashion is used to generate electricity. This reservoir backs up for many kilometers, causing major changes in the environmental and social aspects of the region. Reservoirs have flooded forests, farmland and impeded human development.

The problem with reservoirs is that they occupy land in the valley bottoms, which, in BC, with its high,

jagged mountains, is scarce indeed. It is estimated that approximately five hundred square kilometers of valley bottom in the Columbia Basin are covered by reservoirs. While it is true that hydro dams do not emit chemical pollutants, smoke or contaminated water, the dams themselves actually cause the environmental damage.

Silt carried by mountain streams and rivers is very fine in texture, and natural rivers carry this silt and deposit it along the entire river expanse. When dams are involved, this process changes. Behind a dam, the current becomes nearly nonexistent, so all of the water-suspended sediment settles in the reservoir. As a result, when the river is down and the floor of the reservoir is dry, this fine silt can cause annoying dust storms. To try to solve this dust problem, BC Hydro has tried planting vegetation along the affected areas, and this has reduced the airborne dust problem.



THE TREATY'S REPERCUSSIONS

When the Columbia River Development Treaty allowed the dams to be built, many homes and communities had to be moved or destroyed to stay out of the way of the rising floodwaters from the reservoirs. The problem with this plan was obvious: the people were given absolutely no say in what was going on. There was a deadline to complete the dams, and therefore, a deadline for relocating people.

For many people in the valleys of the Kootenays, farming was a way of life. Many families eked out a living working their rich agricultural land in the valley bottoms. When the negotiators came to their doors and asked them to move their families to higher ground, naturally there was resistance. Many families were alarmed to find out that they had to move from the land that several generations had lived upon. One family, the Sharpes, about to get flooded out because of the Libby Dam project, (remember the 60-kilometer stretch of reservoir that is in Canada that belongs to that Montana dam?) put up resistance. They managed to get big city media attention, but it really didn't matter. In the end, even they had to relocate; there were contracts to be upheld and deadlines to meet.

Most people faced with being relocated did not understand the severity of what was happening. The government negotiators told tales of "progress" and many people agreed, but they still did not want to move from their homes. The small town of Waldo, now under the Libby Dam reservoir, was burned to the ground by the government after the people were left. Many former citizens were horrified to see the place where they had grown up go up in smoke. For these people and others, this didn't seem like progress at all.

All told, approximately two thousand people had to move as a result of dam construction. The largest relocation took place before the Hugh Keenleyside Dam was built. Hundreds of people lost their homes and many towns disappeared when the Arrow Lakes were formed.



THE FIRST NATIONS IMPACT

The First Nations peoples have lived in this area for many centuries, especially in the fertile valley bottoms. It was as much of a surprise to them as it was to everyone else when the water level started rising. Due to the rising water levels in potential reservoirs, several projects were started to try to salvage some archaeological records of the First Nations' civilization.

Prior to dam building, sea-run salmon used to spawn in the Upper Columbia river systems. Long before the Treaty was signed, American-based dams, such as the Grand Coulee, made many salmon species extinct. One native man had this to say: "I've seen it down here, at the mouth of the river, where it widens up -- shallow water, you know and that it was so crowded that you could see from somewhere along the bank, their backs coming up, just hundreds of thousands of them, just coming. Since the Grand Coulee Dam, there hasn't been any fish up here. It was a great loss to us. Course you know, progress they said was construction of this dam, and it's detrimental to us Indians. It's a great loss to us."

APPENDIX A COLUMBIA RIVER DAM SPECIFICATIONS

Bonneville Dam: Columbia River. River Mile 146.1

Constructed: 1938 (second powerhouse completed in 1982)

Owner: U.S. Army Corps of Engineers, Portland District

Full Forebay: 77.0 feet Normal Forebay: 71.5 - 76.5 feet

First Powerhouse Capacity:

Nameplate capacity: 2 @ 43 MW, 8 @ 54 MW, 518 MW total

Overload capacity: 2 @ 47 MW, 8 @ 60 MW, 574 MW total

Station service units: 1 @ 4 MW, 4 MW total

Hydraulic capacity: 136 kcfs

Second Powerhouse Capacity:

Nameplate capacity: 8 @ 66.5 MW, 532 MW total

Overload capacity: 8 @ 76.5 MW, 612 MW total

Fishway units capacity: 2 @ 13.1 MW, 26.2 MW total

Hydraulic capacity: 152 kcfs

Spillway 1: 1450 feet, 18 gates

The Dalles Dam. Columbia River. River Mile 191.5

Constructed: 1960 (units 1-14); 1973 additional units 15-22 completed

Owner: U.S. Army Corps of Engineers, Portland District

Full Pool: 160.0 feet

Minimum Pool: 155.0 feet

Powerhouse Capacity:

Nameplate capacity: 14 @ 78 MW, 8 @ 86 MW, 1780 MW total

Overload capacity: 14 @ 89 MW, 8 @ 99 MW, 2038 MW total

Fishwater units: 2 @ 14 MW, 28 MW total

Stations service units: 2 @ 3 MW, 6 MW total

Hydraulic capacity: 375 kcfs

Spillway: 1380 feet, 23 gates

John Day Dam. Columbia River. River Mile 215.6

Constructed: 1971

Owner: U.S. Army Corps of Engineers, Portland District

Full Pool: 268.0 feet

Minimum Pool: 257.0 feet

Powerhouse Capacity:

Nameplate capacity: 16 @ 135 MW, 2160 MW total

Overload capacity: 16 @ 155.3 MW, 2485 MW total

Hydraulic capacity: 322 kcfs

Spillway: 1228 feet, 20 gates

McNary Dam. Columbia River. River Mile 292.0

Constructed: 1957; second powerhouse deauthorized 1991

Owner: U.S. Army Corps of Engineers, Walla Walla District

Normal Operating Pool 1: 335.0-340.0 feet

Maximum Pool 1: 356.5 feet

Powerhouse Capacity:

Nameplate capacity: 14 @ 70 MW, 980 MW total

Overload capacity: 14 @ 80.5 MW, 1127 MW total

Station service units: 2 @ 3 MW, 6 MW total

Hydraulic capacity: 232 kcfs

Spillway: 1310, 22 gates

Priest Rapids Dam. Columbia River. River Mile 397.1

Constructed: 1961

Owner: Grant County PUD No. 2

Normal Full Pool: 486.0 feet

Normal Low Pool: 481.5 feet

Powerhouse Capacity 1:

Nameplate capacity: 907.15 MW total

Overload capacity: 910 MW total

Wanapum Dam. Columbia River. River Mile 415.8

Constructed: 1964

Owner: Grant County PUD No. 2

Normal Full Pool: 570.0 feet

Normal Low Pool: 560.0 feet

Powerhouse Capacity:

Nameplate rating 1: 1038 MW total

Net Peaking capacity 1: 985 MW total

Hydraulic capacity: 178 kcfs

Spillway: 12 gates

Rock Island Dam. Columbia River. River Mile 453.4

Constructed: 1933, 6 additional units completed 1953, 2nd Powerhouse completed 1979

Owner: Chelan County PUD No. 1

Normal Full Pool: 613.0 feet

Normal Minimum Pool: 609.0 feet

Powerhouse Capacity 1:

First Powerhouse: 3 @ 20.7 MW, 1 @ 15 MW, 6 @ 22.5,

Nameplate capacity: 212 MW total

Second Powerhouse Nameplate capacity: 8 @ 51.3 MW, 410.4 MW total

Total Nameplate capacity: 622.5 MW total

Peak capacity: 660 MW total

Hydraulic capacity: 220 kcfs

Spillway 1: 1184 feet, 31 gates

Rocky Reach Dam. Columbia River. River Mile 473.7

Constructed: 1961 (units 1-4); additional units completed 1971

Owner: Chelan County PUD No. 1

Normal Full Pool: 707.0 feet

Normal Low Pool: 703.0 feet

Powerhouse Capacity:

Nameplate capacity 1: 7 @ 117 MW, 4 @ 132 MW, 1347 MW total

Peak capacity 1: 1287 MW total

Hydraulic capacity: 220 kcfs

Spillway: 12 gates

Wells Dam. Columbia River. River Mile 515.8

Constructed: 1967

Owner: Douglas County PUD No. 1

Normal Operating Pool: 771.0-781.0 feet

Powerhouse Capacity:

Nameplate rating: 10 @ 77.43 MW, 774.3 MW total

Maximum capacity 1: 840 MW total

Hydraulic capacity: 220 kcfs

Chief Joseph Dam. Columbia River. River Mile 545.1

Constructed: 1961 (units 1-16), 1979 (units 17-27)

Owner: U.S. Army Corps of Engineers, Seattle District

Full Pool: 956.0 feet

Minimum Pool: 930.0 feet

Powerhouse Capacity:

Nameplate capacity: 16 @ 64 MW, 11 @ 95 MW, 2069 MW total

Overload capacity: 16 @ 88.3 MW, 11 @ 109.3 MW, 2614 MW total

Station service units: 2 @ 3 MW, 6 MW total

Hydraulic capacity: 219 kcfs

Spillway: 980 feet, 19 gates

Grand Coulee Dam. Columbia River. River Mile 596.6

Constructed: 1942; modified in 1974, 1982, and 1984

Owner: U.S. Bureau of Reclamation

Normal Full Pool: 1290.0 feet

Normal Minimum Pool: 1208.0 feet

Powerhouse Capacity:

Nameplate capacity: 18 @ 125 MW, 3 @ 600 MW, 3 @ 700 MW, 6494 MW total

Overload capacity: 18 @ 143.75 MW, 3 @ 690 MW, 3 @ 805 MW, 7416 MW total

Station service units: 3 @ 10 MW, 30 MW total

Pump/Generator units: 6 @ 52.4 MW, 314.4 MW total

Hydraulic capacity: 280 kcfs

Spillway: 11 Drum Gates, 40 Outlet Tubes (2 gates each outlet)

Waneta Dam. Pend d'Oreille River Mile 0.2
Constructed: 1954 (2 generating units, 3rd added in 1963)
Owner: Cominco Inc.
Powerhouse Capacity: (circa 1962) 180 MW from 2 generating units
Spillway: 9 gates

Seven Mile Dam. Pend d'Oreille River Mile 7.0
Constructed: 1980 (two other powerhouses added on later)
Owner: BC Hydro
Normal Reservoir Level: 60 m
Combined Powerhouse Capacity: 810 MW
Dam is 65.5 m high, 490,000 cubic meters of concrete.



APPENDIX B GLOSSARY OF TERMS:

coarse woody debris - also called large woody debris and a particulate organic matter; name given to dead wood alongside streams and rivers. Makes good shade and homes for various habitats.

fish barrier - an obstruction crossing a stream or river that makes it nearly impossible for fish to jump, climb or swim around it.

Franklin D. Roosevelt - President of the USA from 1933 until his death in 1945. He led the people of the United States through to nearly the end of the Second World War. His "New Deal" and calm demeanor made him one of the most respected presidents of that nation.

full pool - term given to a reservoir that is at maximum capacity.

generator - In power-producing dams, falling water is used to turn and produce energy, which is then processed into usable energy.

Great Depression - May 29, 1929: The Wall Street stock market crash sent the majority of the world into a depression, a time during which inflation ran rampant, jobs were scarce, the morale of the population was low and there was no money.

Lake Roosevelt - Grand Coulee Dam's reservoir. Stretches out on the Columbia River for many miles behind the monstrous dam.

MW - a measure of energy in millions of watts.

reservoir - the area of water behind a dam that has been slowed down or stopped due to the obstruction of the river. Lake Roosevelt is an example of a reservoir. The reservoir can be lowered or raised to accommodate energy production needs, recreational needs, or flood control.

spillway - a gate that is opened up to let water pass through the dam. Used as a control for the amount of water passing through the dam.

USACE - abbreviation for United States Army Corps of Engineers. Responsible for the construction and maintenance of many dams along the Columbia River.

watershed - based around a particular river. The mainstem river, and all its tributaries, subtributaries and drainages up to a maximum elevation.



APPENDIX C

RESOURCES CONSULTED

“Waneta,” *Cominco Magazine*, 1962.

Hydroelectric Power Projects: <http://shazam.cqs.washington.edu/crisp/hydro>.

The Northwest Passage: The Great Columbia River. William Dietrich, Simon & Schuster, 1995.

“Columbia Treaty History.” Columbia Basin Trust. Videocassette, 1998.



A LOOK AT WILDLIFE

PREPARED BY:

Christine Gilliland

Salmo Watershed Assessment Youth Team



Tuesday the dog, rides shotgun after a successful hunt.

The buck has an atypical 32 point rack — pre WWI.

PHOTO COURTESY OF BERNARINE STEDILE



From my Grandfather:

It has been a lean winter. The snows had piled high and it was particularly cold. The families worked harder than ever to stay warm and to keep their bellies full.

It was a full moon and the men having returned from the hunt, the women were preparing an honourary feast. Their checks shone rosy in eager anticipation of fresh meat after weeks of dried fare.

They praised their husbands, sons and brothers and also thanked the animal spirits for their selflessness. In their warm earthen dwellings they calmly awaited their men to pray and purify in a sweatlodge ceremony before their modest solstice celebration began.





THE PEND D'OREILLE VALLEY IS THE STARTING POINT OF THE SALMO WATERSHED, so I figure it is a good place to start looking at some of the wildlife that is there.

I'll start with some of the birds sighted along the Pend d'Oreille. Great blue herons were sighted on both reservoirs occasionally. Ospreys and bald eagles both nest on the shorelines of the Pend d'Oreille and were sighted often. Red-tailed hawks were most frequently seen on the slopes to the north of the Waneta reservoir.

The great blue heron is a long-legged wading bird that feeds on a wide variety of prey, including fish, insects, small mammals, amphibians, and crustaceans. Prey is captured with a quick stab of the beak. The great blue heron usually hunts by wading in shallow water at margins of lakes, slow-moving rivers, and tidal flats. During breeding season, adult males and some females are territorial and will aggressively defend foraging sites from other herons. Although herons normally forage alone and occasionally in loose flocks, they usually nest in colonies. These colonies are usually in high trees and close to water which has a rich food supply for them. Studies done on the coast of BC found that great blue herons hunt within five km of their colonies. There was a heron nesting colony of about sixteen nests present near the site of the current Waneta Dam, but that nesting colony was abandoned when the dam was built. At this time, there is no nesting site within five km of Pend d'Oreille. The closest breeding colony is near Creston. So, in my opinion, construction of the Waneta Dam has greatly affected the populations of the great blue heron in the Pend d'Oreille area.

Observations made indicate that blue herons use the Pend d'Oreille occasionally, as sightings and tracks of single birds have been recorded at the mouth of Cedar Creek, at the Remac Bridge, and along the mud flats just south of Red Bird Creek. There was one sighting of three birds at the Seven-Mile Dam; the birds were foraging for small fish stranded by retreating waters, similar to birds in coastal habitats that gather to feed at low tide.

The next bird I have information on is one of the largest and most beautiful birds in B.C. and it is the bald eagle.

Bald eagles are large raptors found throughout BC. Inland, eagles are usually found near water, in large trees such as cottonwoods. From these trees, the eagles can see the slow-moving (sick or dying) fish that are captured at the surface of the water. Eagles are versatile hunters and will pursue other raptors, such as ospreys, until the harassed bird drops its prey, after which the eagle will retrieve it for itself. Eagles breed regularly along the Pend d'Oreille River, where they make bulky stick nests in large trees near the water. In 1995, three eagles fledged from two nests found along the reservoir.

Increased water level fluctuation in the Waneta reservoir may destabilize the roots of large trees near the reservoir margins, used by eagles for nesting and perching. Conversely, a decrease in fluctuations in the Seven-Mile reservoir will be beneficial for long-term security of such trees. Shoreline trees with nests should be monitored so that stabilizing measures may be taken if a tree is likely to fall while there are young still in the nest.



HARLEQUIN DUCK

Harlequin ducks are occasionally seen at the confluence of the Salmo and Pend d'Oreille rivers. Harlequin ducks are primarily a coastal species, but



Harlequin ducks. PHOTO COURTESY OF RICHARD CANNINGS

also frequent freshwater habitats in the interior of the province, where they prefer fast flowing creeks and rivers. These ducks winter along the coast.

The Salmo Watershed Assessment Project (SWAP) had the opportunity to help with the inventory counting of the harlequin ducks this spring with Marlene Machmer of Pandion Ecological Research, and currently these beautiful ducks have been seen on the Salmo River, along Sheep Creek and at Hall Creek. They have also been seen in other fast flowing rivers and tributaries in our watershed. These ducks come here from the coast to breed and they always return to the same stream or river to breed in following years. The streams and rivers they use for breeding are the streams they were born in. Harlequin ducks are very private and have a very high abandonment rate. For example, if you were lucky enough to come across a harlequin nest, the harlequins would likely abandon that nest site, leaving the eggs behind. Only three nests have been found in all of BC.

COUGAR

Cougars are also known as pumas, mountain lions and even panthers. The total length of a male cougar is between 5.5 and 9 feet, and they weigh anywhere from 145 to 225 lbs. A female cougar is between 5 and 7.5 feet in length and weighs between 80 and 135 lbs.

Cougars range in color from tan to light brown. The mouth, ears, belly and front of the neck are white. The nose is pink with a black border, and the tail, between 20 and 36 inches long, is tan to light brown with a black tip.

The breeding season of cougars varies throughout the year. Cougars usually have 3 to 4 cubs, but can have as few as 1 and as many as 6. This does not necessarily mean they all will live. The gestation period is between 90 and 96 days, and the cubs stay with their mother for the first two years. Even though they stay with the mother for this long, they are very active and are eating solid food within weeks of birth as the mother weans them at 4 to 5 weeks old. A mother cougar has a very big job. After she has her cubs, she not only has to find food for them, but also has to watch over them very carefully because many other animals will try to kill them, such as male cougars, large carnivores, eagles, and large hawks.

Cougars can usually live in the wild for 8 years or more, and they have lived as many as 17 years in captivity. A cougar can adapt to any type of habitat and therefore can be located in most areas. Even though they can adapt well, they prefer to live in thick coniferous forests in the high mountains where they can hide in tall trees and wait patiently for their prey to walk under them. When this finally happens, the cougar drops out of the tree and lands on the prey's back. After landing on the back of the animal, the cougar reaches around to the front and bites down on the throat until the animal perishes.

Cougars prey on deer most of the time, but they also eat porcupines, beavers, rabbits, raccoons or domestic animals (cats & dogs). Man is the cougar's major predator.

BLACK BEAR

The standing height of a male black bear is 4.5 to 5.9 feet, and it weighs from 250 to 600 lbs. The standing height of a female black bear is 3.9 to 4.9 feet and weighs between 200 and 450 lbs.

A black bear has coarse black fur on its whole body, with the exception of a brown nose and a small white marking on its chest. There are many phases of black bears, some being all brown (cinnamon bear). Other phases of black bears include white and blue; these two are restricted to locations on the Pacific coast. Black bears are equipped with short, curved claws that permit them to climb.

Black bears live in many different areas. They can adapt to any living conditions, from flat forests to mountain peaks. They will also eat almost anything, such as worms, berries, and small mammals. They are also known to eat garbage and fruit from dumps and peoples' backyards. Thus, this bear is one of the best omnivores around.

Black bears breed in the spring and have their cubs in their winter den. They usually have 2 cubs, although they can have as few as one or as many as five, not all will necessarily live. The gestation period is from 210 to 220 days, and these bears only have one litter every 3rd or 4th year. The cubs stay with their



Bayman Feeney with black bear, and classmates at school in Salmo. PHOTO COURTESY OF BERNARINE STEDILE

mother until their second summer; then they part and go their separate ways.

The predators of black bears are man, grizzly bears, and grey wolf packs. Along with being killed by their predators, many bears die from being hit by vehicles or shot by conservation officers (COs). There are many reasons that bears are killed by COs, one being that the bears are becoming accustomed to eating garbage either at the dump or in peoples' backyards. Where you have people, you have garbage, and pretty soon black bears start to associate people with food, making them dangerous to have around. Bears also like to hang around some campsites, so you should never keep food in or around your tent as the bears can smell it from miles away and will come searching for the food. This is another reason why COs kill bears. Some black bears can also be very territorial and aggressive to anyone or anything that comes into their territory. COs kill aggressive black bears. It used to infuriate me to no end when I heard of all the bears that had been taken from dumps and destroyed. I would say to myself, why don't they just trap them and take them far back into the bush for release. I understand now that this is not possible because any place that they were to bring these bears would probably be another bear's territory; therefore, the weaker of the two bears would most likely be killed anyway. It's just easier if the COs get rid of the bears that are causing the problems.

It is known that bears will go to places where it's not hard to find food, and once they find a place like this, they keep coming back, even if it is in your backyard. There are some things that we can do to prevent this such as keeping your garbage in a shed or in the house, and picking fruit off the trees and the ground as soon as possible. Another thing that we can do for bears is respect them. When you're out in the wilderness, make noise. Remember that you're in the bears territory, and never try too get to close by sneaking up on them.

Bears and humans can live together if we respect each other and stay out of each other's way. It would also help a little if more people became more aware of bears.

RED-TAILED HAWK

The red-tailed hawk has a wingspread of 4 to 4.5 feet. It has broad wings and a rounded tail. The back of a red-tailed hawk is dark brown with the exception of the reddish brown tail feathers. The underside of the hawk is lightly colored and has streaks of brown throughout. The tail on the underside is also light and has a pink tinge to it. There are two patches of white on this bird's face; one is above the hook-shaped bill, and one is under the bill.

The red-tailed hawk lives in the vicinity of trees in woodlands and open country. The red-tailed hawk makes a bulky nest out of sticks high up in both coniferous and deciduous trees. When there are no trees available, the red-tailed hawk will make its nest on a cliff ledge. This hawk will lay between 2 and 4 white eggs that are blotched with brown. The incubation period is about 28 days.

The red-tailed hawk eats rodents, small mammals, fish and smaller birds.

GOLDEN EAGLE

The male golden eagle has a length of 30 to 35 inches, and the female is about 35 to 41 inches. The wingspan of a male is from 75 to 84 inches and of a female is from 82 to 92 inches.

The golden eagle is a dark brown bird that has paler brown on the legs and tail. The tail also has ashy color that goes around it like bands. The nape of the neck also looks brown, but when the light hits it a certain way, you can see that it is actually a golden color. Although an immature bald eagle looks more like a golden eagle than a bald eagle, you can always tell them apart because a golden eagle has feathers that go all the way down to the toes where as a bald eagle does not.

The golden eagle likes mountainous terrain, foothills and grassy areas where ground squirrels, a major food source, live. They also eat other small mammals, fish and smaller birds. A golden eagle prefers to build its nest on a cliff; when there are no cliffs around they will build their nests in trees. The nest is made out of sticks and other coarse materials. The nest is then lined with leaves and moss. The golden eagle lays 2 eggs; sometimes they are spotted and sometimes they are blotched. The incubation period is about 42 days.

The golden eagle lives throughout British Columbia. They are also found in other provinces in Canada, as well as in the United States.

OSPREY

The length of an osprey is 21 to 24 inches, and it has a wingspan of 54 to 72 inches. The head and the underside of an osprey are white and streaked with brown. The back is almost all brown with the exception of the white on the shoulders and down the nape of the neck. The legs have a few white feathers down the front of them and the rest of the legs are bare. The talons are long and sharp, and the outer toe is reversible. The soles of the feet are covered with spiny projections, that enable them to hold slippery fish, their primary food source.

The osprey lives in the vicinity of water, in places such as lakes, rivers, marshes and bays. Ospreys build huge nests in trees (both dead and living), on the tops of telephone poles, and sometimes on the ground. Nests are made with sticks in no particular pattern. They look like they are just thrown together. Ospreys lay between 2 and 4 white eggs that are blotched with brown; the incubation period is from 35 to 38 days, and most of this is done by the female. Ospreys live and breed throughout all of Canada.

GOSHAWK

The Goshawk has a wingspan of 3.5 to 4 feet. It has a grey back, head and tail. The head also has a white stripe that begins at the base of the bill, goes above the eye, and stops almost at the back of the head. The tail is light grey and has dark grey stripes that go from the top to the bottom of the tail, the very tips of the tail are white. The underside of the goshawk is white with a lot of fine grey stripes. The goshawk has a long tail and rounded wings.

The goshawk likes forests and woodlands, but it prefers mixed wood types. It builds its nest high up in a large tree, and the nest is made of sticks and lined with bark. Goshawks are also known to bring fresh

evergreens back to the nest every so often, presumably for decoration. This bird uses the same nest year after year. The goshawk lays between 2 and 4 pale bluish white eggs, and the incubation period is between 36 and 38 days.

Goshawks eat rodents and small mammals, and unlike other birds of prey, it hunts at low elevations. Goshawks are found in every province in Canada.

OWLS

Out of the 15 owl species in Canada, we have 9 in our area. These are the screech owl, flammulated owl, the great horned owl, pygmy owl, burrowing owl, the great gray owl, the long and short-eared owls and the saw-whet owl. The smallest owls we have here are the pygmy owl and the saw-whet owl. The largest owl is the great-gray owl, which is between 25 and 33 inches in length. Almost all owls have the same structure; by this I mean, they all have the same body frame, but some are smaller and some are bigger. They also have the same shaped face and eyes. They differ in their pattern colors and sizes; some have ear tufts and some don't.

Most owls are nocturnal, although the short-eared owl prefers to hunt at dusk and sometimes during the day. Owls eat rodents, small mammals, and even reptiles; they have also been known to try and steal domestic cats and dogs that are small enough to carry away.

Owls nest in and on the ground, in hollow trees, in old hawks' and ravens' nests, and on cliffs. Most owls have between 2 and 7 eggs that are usually white; the incubation period is between 24 and 33 days, performed mostly by the female. The short-eared and the great horned owls are the most popular in Canada.



ELK (WAPITI)

Early English settlers applied the name elk to this species, although in Europe this name was already applied to the Alces, the animal we know as the moose. Early English explorers to Western Canada called this species 'red deer' and some refer to it as 'Wapiti,' which comes from the Shawnee Indians and means "white rump." So, as you can see, there is some confusion over the common name of this species. This majestic animal is second in size only to the moose in the deer family. An elk's head and neck are long; its muzzle is bare and wet, its body strong and sturdy, its legs moderately long, and its hooves broadly rounded in the back and bluntly pointed in the front. Its tail is short and wedge-shaped.

An elk's antlers start growing in April and have velvet on them until it is rubbed completely off, which is usually done by the end of August. In the spring (February - March) and sometimes not until April, they shed these antlers so that they can produce a bigger set for the next year. Hinds (females) and their calves forage together during the summer, while stags (males) form bachelor bands. In the fall, these groups divide into harems consisting of the hinds with their calves and a supervising stag.

After rutting season (mid September - end of October), all bands join to make a herd of 100 or more animals. These herds are made up of all ages and sex groups combined. They stay together for the winter months. When spring arrives, the hinds separated from the herd to go bear their calves, while the stags again find bachelor bands. Calves are born in late May to early June, after a gestation of 249 to 262 days.

Elk are primarily a grazing species, and they graze on a wide variety of plants during the summer months. An elk's favorite foods include blue grass, brome, wheat grass, June grass and sedge. They also eat licorice root, violets, and clover during the summer. In the winter, they eat a great deal of browse, as well as the twigs of willows, aspen, balsam, and poplar. They also eat wild rose and gooseberry bushes in the winter.

There are an estimated 100 Rocky Mountain elk present in the Pend d'Oreille valley. Elk signs were detected on mud flats just north of the old Remac Bridge. Elk are capable of travelling through great amounts of snow and are usually found at higher elevations both in summer and winter. Elk are found in the Pend d'Oreille valley, are moving into the Salmo Valley, and are also found at higher elevations.

RED AND BLUE LISTED SPECIES AND THEIR RATINGS

Arrow Forest District as of November 1st, 1998.

The ratings are included at the end of this report (pg 105) were provided by the Conservation Data Center (CDC).

BIRDS

WHITE-THROATED SWIFT G5 S3S4B — Blue listed

A white-throated swift has a length of 6" to 7"(15 to 18cm) and has a white throat and breast. The middle of the abdomen is also white with darker sides, and it has conspicuous white patches on either side of the rump. No other Canadian swift has these extensive patches. White-throated swifts nest in crevices on mountain cliffs and canyon walls, making their nests out of feathers, grass and other plant material. The nest is glued together and to the rocks by the bird's saliva. They usually lay 4 or 5 white eggs.

In Canada, their breeding range is in the Okanagan Valley through to Vernon, in places such as Summerland, Osoyoos Lake, White lake, and Rutland.

DIPPER

The length of a dipper is 7 to 8.5 inches. The whole body is slate grey, with the head being the darkest spot on the bird. There is a very thin white line on both the upper and lower eyelids.

Dippers are found throughout our watershed at any fast flowing stream. When standing, this bird has a habit of bending and straightening its legs very fast, which makes it look like its dipping. Which of course is where the name Dipper came from.

Dippers like mountain streams and will build their nests in and on anything that will hold them. They have also been known to build their nests behind waterfalls. Dippers lay 4 to 5 white eggs; and the incubation period is about 16 days and is done solely by the females. Dippers live and breed in all areas of British Columbia.

GREAT BLUE HERON G5 S3B, S2N — Blue listed

The length of a great blue heron is 43" to 52"(109 to 132cm) in size. Their bills are about 5"(13cm) and yellowish in colour, turning almost orange during the breeding season. Their bills are rather stout at the base, tapering to a sharp tip. The upper part of this bird is grayish blue, the neck grayish brown. It has black stripes on the head and down the neck.

Great blue herons feed in open shallow water, either fresh or salt, such as marshes, lakes, rivers and streams and the edges of bays.

Great blue herons nest in deciduous and coniferous trees, in mixed woodlands, and sometimes on the ground. These nests can sometimes be a considerable distance from the water. The nest is a flat structure made of sticks, repaired in successive years. They commonly lay 3 to 5 pale, greenish blue eggs. Incubation is done by both sexes and lasts about 28 days. They have one brood annually. Great blue herons are distributed throughout Canada, and there is a nesting area near Creston.

SHORT-EARED OWL G5 S2N, S3B Blue listed

A short-eared owl has a length of 13" to 17"(33 to 43cm). It has a rounded head and very short ear tufts. The upper part of the body is broad and softly streaked, while the abdomen is narrower and sharply streaked with brown. The short-eared owl has yellow eyes framed by a small poorly defined blackish area on the facial disk.

These owls like open grasslands and grassy or bushy meadows. They also like fresh and saltwater marshes, bogs, and low arctic tundra. The short-eared owl nests on the ground in open places. The nest is lined with grasses and similar materials, and sometimes it is sheltered by a clump of grass or weeds. This owl can have as

few as 4 eggs with the most being 9, but they usually lay 5 to 7 eggs with an incubation period of 24–28 days.

The short-eared owl is often seen perched on fence posts, where it can better observe its rodent prey. This bird is found in most provinces in Canada.

CANYON WREN

G5 S3 — Blue listed

The canyon wren has a length of 5.2" to 5.7"(13 to 14.5cm). It has a relatively long and slender bill. The top of the head is rusty, and the upper back is grayish brown changing to chestnut brown on the lower back and rump. Upper parts are dotted with black and white. It has a rusty colored tail that is narrowly barred with black and flecked with white.

Canyon wrens live in canyon walls, along water on cliff faces and rockslides. They nest in the crevices of rocks and caves, and usually lay 5 or 6 white eggs with sparse dots of reddish brown. Canyon wrens are a very local permanent resident in the southern interior of BC.

PRAIRIE FALCON

G5 S2B, S2N — Red listed

A male prairie falcon has a length of 16" to 18" (40 to 46cm), while the female's length is 18" to 20" (47 to 51cm). They are almost always light brown with darker brown on the top of the head, wings and back. The underside is mostly white with brown spots and streaks. When observed from the air, you can see the black patches on the tips of the wings as well as around the flanks.

The prairie falcon feeds on fish and small birds, which it sometimes grabs right in midair. It has the ability to do this because of its strong dives and extended talons.

Prairie falcons are not good nest builders and have been known to lay their eggs on the bare rocks in cliffs with overhangs. They will also use nests abandoned by birds such as ravens to lay their eggs. They lay 3 to 6 eggs that are creamy ground colors with rich reddish brown markings. The incubation period is 33 to 35 days, done by both sexes. This species breeds in BC, Alberta, Saskatchewan, and on occasion in Manitoba.

BALD EAGLE

G4 S4 — Yellow Listed

A male bald eagle has a length of 30" to 34" (76 to 86cm) with a wingspan of 72" to 85" (183 to 215cm), while a female's length is from 35" to 37" (89 to 94cm) with a wingspan of 79" to 90" (200 to 229cm). Bald eagles have white heads, necks and tail feathers. Their bodies and wings are brown, and the bill and feet are yellow. An immature bald eagle looks much like a golden eagle, and it takes approximately 4 years for their heads and necks to turn fully white.

Eagles like to build big stick nests in large trees like cottonwoods along rivers and around other bodies of water. They lay between 1 and 3 eggs, usually only 2. The eggs are dull white and small, compared to the size of the parents. Incubation is about 35 days and is done by both sexes. Eagles mate for life and fix and use the same nests year after year, so the nests can become very large. Bald eagles live, breed, and spend the winter in most parts of Canada.

BOBOLINK

G5 S3B, S2N Blue listed

A bobolink has a length of 6.5" to 8" (16 to 20cm). The beak is black and sparrow-like. An adult male in its breeding plumage is mostly black with a yellowish patch on the back of the head. It has streaks of white on the upper part of the back, while the lower back has white patches. The wings are mostly black and have white and yellow streaks along the edges. The tail has the same streaks as the wings and is sharply pointed. The adult female is mostly brown, with streaks of yellow and black. It has a patch of white on the neck right under the beak, which is brown, edged with black.

Bobolinks like open fields and meadows with tall grass, grain, and alfalfa. Their nests are flimsy and are made with grass and weeds. They lay as few as 4 and as many as 7 eggs, that are pale gray to brownish with irregular spots ranging in color from brown to purplish. Incubation period is 10 to 13 days, done by the female. Bobolinks can be found in most provinces in Canada, but it is a summer resident and breeds in BC.

LEWIS'S WOODPECKER G5 S3B, S2N — Blue listed

A Lewis's woodpecker has a length of 10.5" to 11.5" (27 to 29cm). The upper parts of a Lewis's woodpecker are glossy greenish black, except for a narrow gray collar and a dull red face. The breast is gray, tapering off into a shaded rose, which appears on the abdomen, sides, and flanks.

This bird likes open areas with scattered trees in places such as burnt lands with standing dead wood, wooded roadsides, and open woodlands. They excavate tree cavities where they make their nests. They have 6 to 7 dull white eggs, and both parents do incubation. Lewis's woodpeckers breed from southern B.C. to southwestern Alberta, although their range is from BC to Ontario.

WILLIAMSON'S SAPSUCKER G5T4 S3B,S2N — Blue listed

A Williamson's sapsucker has a length of 9" to 9.7" (23 to 25cm). The male and female birds look very different from each other. The males are almost all black with white speckles on their wings. The upper breast has a black patch, while the lower patch is yellow. The sides and undersides of the tail have black and white "V" shaped markings. The head and bill are also black with two white lines, one that runs across the top of the bill from cheek to cheek and the other that extends from the corner of the eye to the back of the head. The female, on the other hand, has a yellowish brown head with brownish stripes that run down the sides of the neck. The upper chest has a grayish blue patch with a yellow patch on the lower body. The rest of the female's body is striped and speckled with brown and white.

This bird nests in excavated tree cavities in yellow pine, Douglas fir, and larch trees, both dead and living. Williamson's sapsuckers lay 5 to 6 white eggs that are incubated by both sexes. They breed and live in only two places in BC, the Okanagan and the East Kootenays.



FRESHWATER FISH

WHITE STURGEON (Columbia River population) G4T ?Q S1 — Red Listed

White sturgeons are very large fish, reaching lengths of 20 feet and weighting up to 1800 pounds. Their heads are flattened, short and blunt. They have very small mouths and have no teeth. They have 4 barbels that are far forward in front of the mouth. The head and back are covered with bony plates and the body has several rows of shields, the dorsal shield, the lateral shield, the ventrolateral shield and the dorsal fin rays, which are 44" to 48". White sturgeon can be found in large lakes and rivers such as the Columbia, the Fraser and the Kootenay Rivers, as well as in Kootenay Lake. The white sturgeon is the largest fish that is found in freshwater here in BC.

MOTTLED SCULPIN G5 S3 Blue listed

The total length of a mottled sculpin is 4-3/4"; it is light to dark brown with dark markings. A mottled sculpin has strong teeth on palatine bones. The distinguishing characteristics of a mottled sculpin are banded pectorals, an incomplete lateral line that extends past the second dorsal, two pores located under the mouth, and a fully formed fourth ventral ray. Mottled sculpins can be found in the upper Columbia River.

SHORTHEAD SCULPIN G5 S3 — Blue listed

The shorthead sculpin is much the same as the mottled sculpin, except the shorthead sculpin, has a shorter head and a fully formed pelvic ray, rather than a ventral ray. The shorthead sculpin is also a sculpin of swift water.

UMATILLA DACE G4 S2 Red listed

The Umatilla dace has a short barbel that does not protrude beyond the corner of the mouth. It has a robust body with 56 to 72 lateral scales, and 29 to 40 scales around the caudal peduncle. The Umatilla dace is

found in the Columbia River drainage in British Columbia, Idaho, Washington and Oregon. It likes rubble riffles and runs of large rivers.

BULL TROUT

G3 S3 — Blue listed

Even though this fish is named bull trout and has a trout-like body, it is not a trout at all. It is a char, with a long slender body and large head. Bull trout can reach a length of 36" and weigh as much as 30 lbs. It has an olive-green color with many round light spots. Spawning males develop brilliant colors with orange bellies and red lower fins. The characteristics of a bull trout are the lack of wavy marks on the back and an unmarked dorsal. The bull trout is also commonly known as Dolly Varden, even though these are two totally different fish.



MAMMALS

TOWNSEND'S BIG-EARED BAT

4 S2S3 — Blue Listed

The length of a male Townsend's big-eared bat is 3.8" to 4.1", the female is 3.9" to 4.4". These bats are grayish brown on the topside and tan on the underside. They have very long ears that are joined across the forehead. They have dark and naked wing membranes, and a prominent calcar that is a toe. Townsend's big-eared bats like to inhabit deciduous and pine forests. They nest in caves and trees that stay dark during the day because these bats are nocturnal. Their litter size is 1, and the gestation period is between 56 and 100 days.

These bats feed on moths that they find by listening for their soft, low frequency echoes, which the bats can hear from long distances. The Townsend's big-eared bat has a life span of 5 years, and its predators include cats (big and small), weasels, snakes, hawks, and owls, to name a few. Because it has so many predators, the Townsend's big-eared bat that lives 5 years is probably very lucky.

WOLVERINE, LUSCUS SUBSPECIES

G4T4 S3 — Blue Listed

A male wolverine has a length of 3.1 to 3.5 feet, the female, 2.5 to 3.1 feet. The weight of the male is 25 to 36 pounds, and the female weighs between 14.5 to 33 pounds. Wolverines range in color from a dark yellow-brown to almost black. Its cheeks, forehead, and ears are lighter in color. The underside of a wolverine is also dark brown, and it has irregular creamy-white spots on the chest and throat.

Wolverines can be found in the mountains near tree lines, rocky outcrops, steep canyon sides and open tundra. A wolverine can have between 2 and 5 kits (young) but they usually have only 2 or 3. The gestation period is between 215 and 273 days, including the delayed implantation. The babies are born in the spring and a wolverine has a litter every second to third year.

Wolverines eat a wide range of plants and animals such as deer, caribou, and other small game. They also eat roots and berries. Even though a wolverine has enough power to take down a caribou, it is generally a scavenger and can sniff out food from very long distances. The major predators of the wolverines are man, wolf packs, and large bears. They probably live for several years in the wild. They can live up to 17 years in captivity.

FISHER

G5 S3 Blue Listed

The total length of a male fisher is 2.5 to 3.5 feet, a female, is 2.5 to 3.1 feet. The male weighs 5.5 to 12 lbs., the female, weighs 3 to 7 pounds.

Fishers range in color from an orangish-brown to grayish-black. Their coats are thick, glossy, and grizzled. The fisher has lighter fur around the face, ears, and shoulders. The underside is also lighter, and it has white to creamy patches on the chest and around the underarms.

Fishers like to live in continuous forests in the vicinity of water. They also like forests with extensive canopy cover and try to avoid open areas. This well forested area is also the place where they have their young.

They can have anywhere from 1 to 6 babies in a litter, although the average is only 2 or 3. The gestation period is 338 to 358 days.

Fishers are carnivores, and they will eat anything that they can overpower. They will eat some plant materials and are one of the few animals that feed on porcupines. Fishers are very agile, and they have a life span of about 7 years in the wild. The predators of fishers are man and possibly wolves.

According to Salmo resident Dave Bush, there used to be a lot more fishers in the Salmo watershed. He used to see them and their tracks while he was walking along the river and through the woods, which he has done for many years. Dave also informed us that he knows there has been a decline in this species, and he has not even seen their tracks for about 20 years.

WOODLAND CARIBOU (SOUTHERN POPULATION) G5T2T3Q S2S3 — Blue Listed

The height of a woodland caribou is 3.5 to 4 feet. The weight of the male caribou ranges between 250 and 600 pounds, and the females weigh between 150 and 350 pounds. Woodland caribou are generally all brown, with the exception of white around the neck, rump and at the bottom of the legs, just above the rounded hooves. The shade of brown on the body changes depending on the season. In the winter months, they are a lighter brown; the rest of the year they are a darker brown. The antlers, which can be found on both the male and female, can reach up to 60", with the females' being slightly smaller. The skull of a woodland caribou has between 32 and 34 teeth.

Woodland caribou like coniferous, muskeg, and old growth forests. They live together in these places in herds from 20 to 450 animals. They mate (rut) in late September, and the fawns are born in late May, after a gestation period of about 8 months. A female caribou usually has only a single fawn, but sometimes twins are born. The fawns are able to follow their mothers after they are completely dry, which is very shortly after birth. The fawns are greyish-brown in color.

Woodland caribou eat a wide variety of broad-leafed greens from spring through to winter. Early in the winter season, the caribou dig in the snow, looking for some vegetation that may still be green. When they can no longer find this green vegetation, they start to eat arboreal lichens. Their winter diet is not the best, but it keeps them going until spring.

The predators of the woodland caribou are cougars, bears, and wolverines, although their biggest predator is man. Woodland caribou like to live at high elevations during the winter in order to avoid their predators. This leaves them isolated in the high country because, when other animals such as deer migrate to lower elevations, so do their predators, which are the same as the caribou's. The high country suits the caribou because they can stand on the deep snow to reach the lichen from high up in the trees. The woodland caribou can also move through the deeper snow very well.

BADGER G5 S2 — Red Listed

A badger is 22" to 28" from the head to the tail, it weighs between 13 and 25 lbs. The main body of a badger is yellowish-white, with a couple different shades of brown and also some black. The nose is mainly black and has a white stripe that runs up the center and over the crown of the head. The cheeks and ears are white, bordered with black. The feet are black, and the claws on the front paws are very long and sharp, making it easier for them either to dig a den for themselves or to dig up rodents, their major food source. Badgers also eat other small mammals, as well as birds and their eggs.

Badgers like deserts and open grasslands where they make their dens in clay and sandy soils. A badger can have between 2 and 5 babies, with an average of 4 in a litter. The gestation period is between 6 and 9 months, this including the delayed implantation. Although badgers are nocturnal animals, they can be seen during the day, especially in the early morning.

The predators of the badger are man, coyote, golden eagles, and grizzly bears. The average life span of a badger is 4 to 5 years in the wild, with the maximum being 14 years. In captivity, one was noted as living 23 years and 8 months.



Bernard Feeney with grizzly bear. — circa 1930's.. PHOTO COURTESY OF BERNARINE STEDILE

GRIZZLY BEAR

G4 S3 — Blue Listed

The standing height of a grizzly bear is 8.5 feet, and they weigh between 325 and 845 lbs. The grizzly bear is all brown, with the exception of the light colors on the nose, ears and sometimes the rump. The grizzly has a prominent hump on the top of its shoulders, caused by the massive muscles on the forelegs. When you see this bear, the hump makes it easier to tell exactly what species you are seeing. The tips of fur on the hump are white. This gives the bear the grizzled affect, hence the name.

Grizzly bears like the high country, such as alpine tundra, open areas, and alpine meadows. They can also be seen sometimes in valley bottoms, along streams and rivers as well as roadsides. Grizzly bears mate in the spring. They have an average litter size of 2 cubs, although they can have as few as 1 or as many as 4 every third year. The gestation period is between 180 and 266 days. The cubs are born in the winter den between January and February. They are born naked, and their eyes are closed. After about 10 days, they have started to get some fur and their eyes are starting to open. Grizzly bears live an average of 25 years in the wild and possibly up to 50 years in captivity.

Grizzly bears are omnivores and eat a lot of plants. They also eat fruits, insects, salmon, fungi, moss, and ground squirrels. These bears have also been known to eat newborn elk, moose, deer, and caribou. The only known predator of the grizzly bear is MAN!



REPTILES

RUBBER BOA

G5 S3S4 Blue Listed

The rubber boa is an olive green to chocolate brown snake that grows to a length of 84 cm. It is a constrictor that feeds on small mammals, birds and lizards. Rubber boas are mainly nocturnal and prefer moist streamside areas with lots of cover, such as boulders and rotting logs (Behler and King, 1979). Like most reptiles, rubber boas hibernate during the winter months. A rubber boa was observed in 1994 on Limpid Creek about 50 m upstream from the Seven-Mile Reservoir.

WESTERN PAINTED TURTLE G5 S3S4 — Blue Listed

Painted turtles prefer slow-moving, shallow streams and ponds with soft bottoms and lush emergent vegetation. The young turtles are carnivorous and eat small fish and aquatic invertebrates. Older turtles, on the other hand, are mostly herbivorous. Turtles spend a large part of the day basking on sun-warmed rocks or floating logs. When the cold weather comes, turtles become torpid and hibernate during the winter. Western painted turtles can be found at Rosebud Lake. They can also be found around Erie Lake in some places, and there is a spot from which you can see them right beside the highway, just east of the Erie Lake rest stop. I have personally noticed that if you want to see turtles, you have to be very quiet and kind of sneak up on them. It has been brought to my attention that, the turtles in Erie Lake cross the highway to make their nests and lay their eggs; consequently some are run over. These turtles lay their eggs in the spring and early summer. As of next spring, some turtle crossing signs will be put up at Erie Lake by the Columbia Basin Fish and Wildlife Compensation Program.

WESTERN RATTLESNAKE G5 S3 — Blue Listed

The maximum-recorded length of a western rattlesnake is 145 cm. This is very large for this reptile. The western rattlesnake has brown or black blotches on a cream to grey ground color. The tail of a rattlesnake is made up of bony interlocking segments. Baby rattlesnakes start off with one segment that looks like a button. Every time the western rattlesnake sheds its skin (several times a year), it gets a new button or segment. These segments eventually look like a rattle, and when these segments are vibrating, they also sound like a rattle. This, of course, is how this snake got its name. If you ever get close enough to a rattlesnake and hear the rattling sound of the tail, this is a warning sign to stay away.

The western rattlesnake is extremely venomous. It uses this venom to kill its prey and to protect itself from predators. The western rattlesnake feeds on rodents and other small mammals. It does this by quickly striking and releasing enough venom to paralyze the animal; then it unlocks its jaw and swallows the animal or rodent whole.

The western rattlesnake lives in arid valleys and on slopes in some places in BC. It dens in very large numbers in dark caves and crevices; where it has its babies and stays for the winter.



RANKING LIST

G = The global rank.

S = The provincial rank.

1 = Critically imperiled because of extreme rarity (5 or fewer extant occurrences or very few remaining individuals) or because of some factor(s) making it especially vulnerable to extirpation or extinction.

2 = Imperiled because of rarity (typically 6 to 20 extant occurrences or few remaining individuals) or because of some factor(s) making it vulnerable to extirpation or extinction.

3 = Rare or uncommon (typically 21 to 100 occurrences); may be susceptible to large-scale disturbances; e.g. may have lost extensive peripheral populations.

4 = Frequent to common (greater than 100 occurrences); apparently secure but may have a restricted distribution; or there may be perceived future threats.

5 = Common to very common; demonstrably secure and essentially ineradicable under present conditions.

U = Status uncertain, often because of low search effort or cryptic nature of the element; uncertainty spans a range of 4 or 5 ranks.

? = Limited information is available or the number of extant occurrences is estimated.

Z = Occurs in the province but as a diffuse, usually moving population; difficult to impossible to map static occurrences.

T = Designates a rank associated with a subspecies.

B = Breeding; the associated rank refers to breeding occurrences of mobile animals.

N = Non-breeding; the associated rank refers to non-breeding occurrences of mobile animals.

Q = Taxonomic validity of the element is not clear or in question. (Ranking List provided by CDC)



RED AND BLUE LIST OVERVIEW

Almost all the species that are on the Red and Blue Lists are at risk because of to habitat destruction of all kinds. I personally wonder if there is anything that can or will be done to prevent this from continuing into the future. Can we as capable human beings do something to rectify some of these situations NOW? Will these wonderful animals be here for future generations to enjoy? Its up to us to decide! All I know is that there has to be something we can do to diminish this list to some extent.



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APPENDIX



**Bernarine Stedile (Feeney) with Bucky the deer
and Beannie, the dog — circa 1940's.**

PHOTO COURTESY OF BERNARINE STEDILE



On September 26th, 1999, the Salmo Watershed Assessment Youth hosted a BC Rivers Day celebration in Salmo, British Columbia to honour the beautiful Salmo River. During this celebration they presented information they had gathered during individual assignments as part of their five month long assessment of the Salmo River Watershed.

This group came to feel strongly about wanting to extend the knowledge they had gathered to our community. On our suggestion, they centred their presentations and a potluck dinner around BC Rivers Day. As with many of their activities, they quickly assumed responsibility for the event in which they were to play the major role. In fact, the Project Coordinator, Doug Ellis and the Project Manager, Gerry Nellestijn literally moved out of the way to avoid their flurry of organization.

First a little worried, then a little confused we quickly became delighted with the sincerity and efficiency with which our team tackled the formidable task of what was to become a grand pot luck lunch and series of quality presentations culminating, where it should, on the shore of the Salmo River at Shingle Mill Flats.

In total some 65 people enjoyed this day. It was a celebration of the Salmo River, and certainly for Doug and I and the rest of the audience, a celebration of our youth. Two days later Doug received the following letter from Bernita Lynde. Although addressed to Doug, this letter was addressed to all who read it, especially our Youth Team, 'The SWAP Squad.' To you Vernita, we extend our thanks for your kind words but especially for sharing your moment of nostalgia and passion for stewardship. We'll not forget your guidance.



BC RIVERS DAY RECOGNITION LETTER

September 27, 1999

Dear Doug,

I so much enjoyed the Rivers Day potluck and program. The reports of the activities of your youth team – revealing so much in-depth research and some high quality speeches.

It made my heart glad to feel the sincerity, commitment to the land, nature in all its forms and people and the struggle to bring other peoples' thinking back to stewardship, not rape, of nature.

Great waves of nostalgia washed over me as I listened to the reports. My sense of history, and a very long memory wakes me, and eighty-five year old “keeper of stories.” This story spans well over a hundred years!! John and I both lived in London, England, but loved the country and nature and were raised to respect, observe and not despoil it.

John was introduced to fly fishing and fly tying as a college student in Devonshire and was instantly hooked by the witchery of streams and what lived in and along them. He also met Tom Scott who lived in his heritage home by the River Dart (Devon). Tom was then about 60, a fine fly fisher and tyer and devoted naturalist and was a wonderful mentor for John. John also met and talked with several noted fly fishermen of that older generation. John started his casting and flytying school and became a riparian consultant in his 20s. The war curtailed his activities and we immigrated to Canada in 1948. We settled first on Vancouver Island and John soon met up with Roderick Haus Brown: they were kindred spirits and became fast friends.

From then on we both became more and more conversant with, and concerned about rivers and the environment and John became a major influence on fish and river protection. He was well respected by wild life authorities in the East and West Kootenays and I was also tagging along.

An important way he spread his wisdom and love of the natural environment to others was the flycasting course he gave each Spring until he could no longer hold a rod.

So you see, I am deeply delight that your young people (and your members) are now carrying the torch.

I would say to them – well begun!! Hang onto your feeling for the unspoiled and despoiled outdoors – be passionate about raising and spreading environmental awareness. I hope your summer brought you a great deal of satisfaction and inspiration.

I am part Welsh descent (Celtic) and have a great respect for the First Nation's “Great Spirit” and links with nature.

On a more practical note I would urge anyone who has be make a point or present a message, consider taking some instruction in public speaking. If your ideas are worth anything – be equipped to present it in the best possible way. This will also do wonders for your self esteem and self confidence. I might add a lot of people in high places could do with this training too!

I cannot close without congratulating the Salmo Watershed Assessment Program members on such a well set up event, which I hope will become an annual affair and I have no doubt the evening's activities were a wonderful wind-up to the day.

Best wishes,

Vernita Lynde

