



Natureline

SPRING 2004

PEACE/WILLISTON FISH AND WILDLIFE COMPENSATION PROGRAM



A research partnership between the Peace/Williston Fish and Wildlife Compensation Program and industry and agency partners will help determine the best practices for the integrated management of the land base to ensure the future viability of mineral licks and trail systems used by generations of mountain goats.

Science, industry work together

PWFWCP collaborates with industry to improve integrated management strategies

Researchers hope a joint initiative of the Peace/Williston Fish and Wildlife Compensation Program (PWFWCP), Slocan Group, Mackenzie Operations, Abitibi Consolidated, the Ministry of Water, Land and Air Protection, and the Ministry of Forests will pave the way to improving integrated management of forests and mountain goat habitat in the Mackenzie Timber Supply Area, and elsewhere too.

"The current forest development plans in the Ospika River valley present a unique opportunity for the creation of a collaborative study that we hope will lead to the development of effective operational management guidelines for mountain goats," said Mari Wood, senior wildlife biologist with the PWFWCP.

Although the mountain goat has been designated "regionally important" under the BC Identified Wildlife Management Strategy, a lack of technical information on goats has limited the available management options.

The mountain goat is found primarily in rugged terrain at high elevations. To meet their nutritional requirements in the spring to fall period, they rely heavily on mineral licks (exposed fine-textured mineral soils). In many areas like the Ospika drainage, these mineral licks are found at lower elevations, forcing goats to move through commercial forests to access the licks.

Traditional use of licks by successive generations of goats has resulted in well-used trail systems through forested habitats, creating ideal conditions for researching the impacts of industrial forest development on mountain goat habitat.

The Ospika Goat Project was initiated in 2001 by the PWFWCP with the support of industry and government agencies. "Its primary goal is to provide information that will lead to the development of effective operational management policies around mineral licks and along forested access trails," said Wood. Industrial forest development has

the potential to reduce or eliminate goat access to mineral licks, she explained. It can also cause disturbance to goats, and create easier access for hunters and predators.

While Slocan will be conducting resource inventory, goat population assessments and habitat supply modelling across the greater Mackenzie Timber Supply Area, the PWFWCP's Ospika Goat Project is focused on goat use of mineral licks in the lower Ospika River drainage and its surrounding mountain ranges. Together these components make up the Mackenzie Mountain Goat Initiative.

Biologists identified four clay-bank mineral licks, three on the east side and one on the west side of the Ospika river. Logging will occur near two of the sites, with maintenance of a forested buffer along the trail and around the lick at one site, and no buffer left at the other. Remote monitoring of the licks and their access trails began in spring 2002 with the installation of seven radio-telemetry stations and 15 trail-monitoring camera

systems. In the winter of 2002/03, the area adjacent to the buffered trail and lick scenario was harvested. The non-buffered site is scheduled to be logged in winter 2004/05. Biologists will monitor the activities of goats in the Ospika River drainage until 2006.

"We'll be monitoring all goats using the licks, including 18 radio-collared goats, to see what, if any, impacts the two different forest harvesting scenarios will have on the behaviour of the goats," said Wood.

Specifically, biologists will determine the timing and frequency of trail and lick use by radio-collared goats, the duration of visits to the licks, and the use of alternative trails before and after harvesting. They will also determine the timing, frequency and season of use of forested access trails by unmarked goats, and identify radio-collared goats that don't use the licks. Other factors that may influence lick use, such as weather, presence of predators, and availability of other licks, will also be examined.



Natureline is a publication of the Peace/Williston Fish and Wildlife Compensation Program





Ospreys use nesting sites, such as these snags on the Williston Reservoir, but change locations over time.

Osprey population stays stable

Wildlife biologists with the Peace/Williston Fish and Wildlife Compensation Program (PFWWCP) are engaged in a project to see if osprey populations around the Williston Reservoir might need help sustaining nesting sites in the future.

Biologists working for the PFWWCP have monitored the status of osprey nests around the reservoir since 1995. Snags (standing dead trees) left behind after the creation of the reservoir some thirty years ago are the primary sites used by nesting ospreys. Over time, however, these snags will eventually fall down, which may impact the osprey population.

"The object of the project is to monitor the population status and nesting habitats of the ospreys, and to design and implement enhancement strategies to maintain their population, should they be needed," explained program biologist Fraser Corbould.

Surveys were conducted in 1995, 1997 and again in 2002 to assess the abundance and distribution of osprey nests around the reservoir. They also examined osprey clutch sizes

(numbers of eggs per nest). The number of nests appear to have remained stable over the survey period. There were 112 nests in 1995, with 75 occupied. The 2002 survey showed 134 nests, with 79 occupied. (Ospreys typically create more nests than they use.) Clutch sizes also appear to have stayed the same, with an average of 2.5 eggs per nest.

Although the number of nest sites remained the same, most sites located in the 1997 survey had been replaced by new sites by 2002. Also, there appeared to be a trend in nest sites being situated away from the Manson area and towards the Finlay area, and from the lower to the upper portion of the inundation zone. The latter positional change is most likely a factor of where potential nest sites were available in these two areas. The reason for the geographic shift is not yet known.

The 2002 survey showed that, although ospreys appear to change the location of their nesting sites over time, the overall osprey nesting population appears to have remained stable, Corbould said.

Similar surveys are scheduled to be conducted again in five years. Should the ongoing loss of snags show negative impacts on the osprey populations, the re-establishment of nesting structures in key locations will be considered, he said.

Natureline

A summary of our activities in 2002/2003

Fish updates

Williston watershed stream temperature monitoring

Water temperature determines the health and abundance of many fish. To properly manage the fishery resources in the future, knowing the historical water temperatures of major streams of the Williston watershed is important. Biologists with the Peace/Williston Fish and Wildlife Compensation Program (PFWWCP) have undertaken the recording of water temperatures in the main inlet streams flowing into Williston Reservoir to monitor the effects of global warming and resource extraction so future biologists can manage fish and their habitat more effectively.

Program biologists are working in conjunction with the Water Survey of Canada, the Ministry of Sustainable Resource Management (Aquatic Information Branch), and BC Hydro. The project involves monitoring 10 already-established hydrometric stations, each collecting data on



Streams and rivers in the Williston Reservoir watershed will be monitored for temperature changes that might affect the fishery resource.

precipitation, air temperature and water level. Although these stations have been in operation for years, this project marks the first time they will be used to monitor water temperature.

They will record the water temperature every hour and, once the year's temperatures are downloaded to a computer, the daily mean, minimum, and maximum temperatures will be determined. The data will then be archived and kept on file to help in future management decisions about fish and fish habitat within the Williston drainage.

In addition to providing valuable data for the future, this first-ever stream temperature monitoring project is raising interesting questions about how such research can be conducted so as to produce the most effective results possible, including: At what location of the river should sensors be placed to record the temperature? What does the profile of the river look like and are there differences from top to bottom and from stream bank to stream bank? What are these changes seasonally? How do we know if the sensors are recording accurately? What is a quick and easy way to check the sensors while out in the field? No collection standards have been developed for collecting water temperature in the province.

As two specific rivers have been used as control sites biologists seek to answer these questions: the Parsnip River and the Pack River. In order to verify the accuracy of the equipment, a second water temperature recording device has been installed next to the existing sensors in these control rivers. Data from the temporary sensors will be compared with the existing sensors' data, and regular checks in the field will verify the accuracy of the existing sensors on all rivers. Profiles of each control site will also be conducted during winter and summer months in order to compare differences at different points in

the rivers. Data from this comparison will help determine the proper placement of the sensors in the rivers, and eventually contribute to the collection of long-term water temperature collection standards for the province.

Aerial boat counts

Aerial boat counts are carried out in B.C. as part of the Small Lakes Index Management (SLIM) program. The aerial boat count program is designed to develop and monitor a standard index of angler activity by capturing "instantaneous boat counts" at a single time (midday on weekends) throughout the summer angling season. Flight patterns, dates, and times are standardized to allow for consistent comparisons across regions and years.

The Peace/Williston Fish and Wildlife Compensation Program (PFWWCP) conducted aerial boat counts on seventeen lakes during the summer of 2002. The purpose of the count was

to gain a better idea of the use by recreational anglers of stocked lakes in the Williston watershed. The boat count data can provide an estimate of relative summer angler effort on each lake. This method of determining angler effort is only one of the tools identified that contribute to the management and evaluation of small lake fisheries.

Many different factors can contribute to the level of usage of a lake, including: whether the lake has vehicle access, the number of campsites present, the size of the lake, and what species is stocked in a particular lake. Approximately half of the survey lakes have vehicle access with an area to launch a car-top boat. Ten of the lakes also have campsites available. Most of them would hold only a truck and camper or a small travel trailer. The size of

these survey lakes ranged from 3.7 to 186 hectares. Only two species of fish are currently being stocked within these survey lakes: eastern brook trout and rainbow trout.

During 19 flights, a total of 262 boats and shore anglers were counted. The four highest-use lakes all have vehicle access, while four lakes that appear to have no angler sightings are all hike-in lakes.

Shore boats were the most commonly counted during the survey. The count may be skewed by the fact that some boats remained for a few months on the shore of a lake and may have been counted more than once.

Angler use can also be dependent on a number of different lake characteristics. Many of these factors cannot be addressed in an aerial survey. Future creel (on the ground) surveys would aid in determining angler use. The important finding of this aerial boat survey is that certain lakes are being used more heavily than others and some lakes in the stocking program appear to be angled to a lesser degree.

Kokanee spawner surveys

Biologists with the PFWWCP surveyed over 100 rivers, streams, and creeks tributary to Williston Reservoir in order to estimate the number of kokanee returning to spawn in September 2002. Kokanee are native to the Williston watershed, and were also stocked by the PFWWCP from 1990 to 1998. A total of 81,000 kokanee were observed in the 2002 survey, with the majority of the fish observed in the Germansen and Osilinka Rivers. Surveys were conducted again in 2003. The findings of the latest surveys are not yet available. Results from these surveys have helped ensure the goals of the PFWWCP fish stocking program are being met.

updates

Wildlife updates

Mackenzie migratory songbird banding

The PFWWCP again provided funding to the Mackenzie Nature Observatory (MNO) to assist with the banding of migratory songbirds during their fall migration. The station was operational between mid-July and mid-September. A master bander was hired for the season and assisted by volunteers from the MNO, other organizations and the general public.

Weather monitoring stations

In the spring of 2002 snow and temperature data from the previous winter were collected from six remote-monitoring snow stations within the Williston Reservoir watershed:

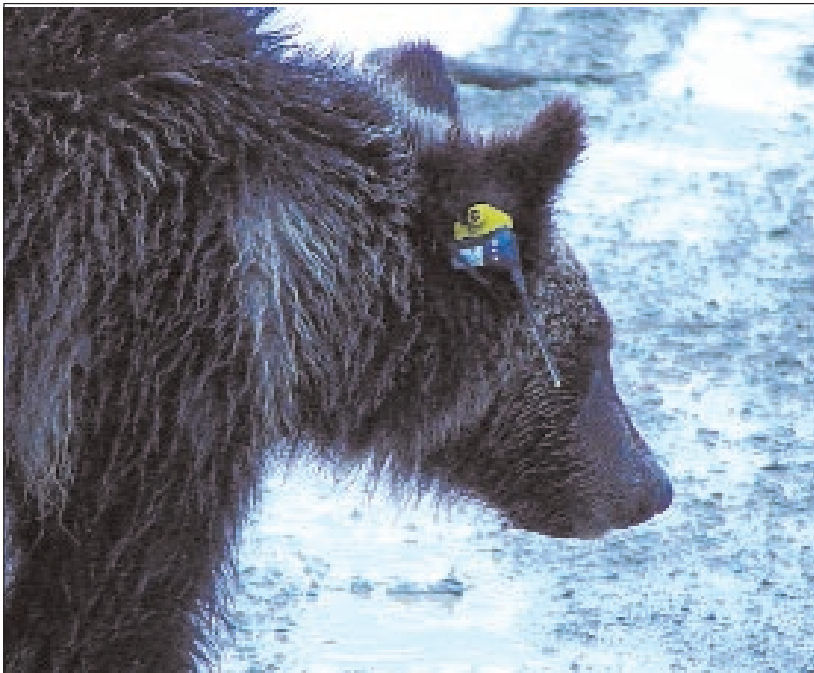
Squawfish Lake, Manson River, Ingenika River, Ospika River (high- and low-elevation sites) and Aylard Creek. In the summer and fall the Squawfish, Manson and Ingenika stations were permanently dismantled, and the upper and lower Ospika stations were upgraded to full weather stations. Four new stations were also established: two regular snow stations at Pelly Lake and Horetzky Point, and two full weather stations at 20 Mile Point and the Ospika River. Data will supplement current wildlife projects and assist in assessing a site's potential for future project opportunities.



Biologists began capturing and radio-collaring Stone's sheep in the Peace Arm of the Williston Reservoir in 1999. This ram was collared in 2003 and continues to be monitored.

20 Mile Point Stone's sheep

Along the north side of the Peace Arm (Williston Reservoir), an investigation into the extent and effects of a winter tick infestation on Stone's sheep continued with aerial monitoring of 21 radio-collared sheep. Lamb production was assessed in June, and lamb survival surveys were conducted in August, December and March. Seven adult ewes died between April and June 2002; mortality sites were investigated and carcasses were sent to the University of Saskatchewan for analysis. Five sheep died of starvation, likely related to the late spring snowfalls and cold weather, one fell from a cliff, and one cause of death was unknown.



Grizzly bears using the McLeod Lake landfill were radio-tagged in 2000, one year before it was closed. Their movements were monitored until 2003.

Seven of 14 surviving sheep were recaptured and examined in March and April 2003. Tick loads and associated hair loss were found to be minimal.

McLeod Lake grizzly bear behaviour

The second year of data collection after closure of the McLeod Lake landfill was completed in 2002/03. Up to five radio-tagged bears captured prior to the landfill closure were monitored weekly by aircraft between den emergence (April) and den entry (November/December).

Visits to the old landfill site by radio-tagged bears were also monitored by a remote radio-telemetry datalogger at the landfill. Although no bears died this year, contact was lost with three bears because radio collars dropped off or malfunctioned.

Cottonwood tree enhancement trial

This enhancement trial, begun in fall 2002, was designed to determine if creating holes through the outer bark and sapwood of mature cottonwood trees would hasten the establishment of heartrot, and thus create access routes and internal chambers that can be used by secondary cavity-using wildlife such as fishers, small owls, and some songbirds and ducks. The Redrocky Creek area was chosen as the test site. Trees were selected and holes were drilled into 82 large-diameter cottonwood trees in

logged and forested settings. Another 93 trees were marked to help assess tree retention rates.

Parsnip weir feasibility

Biologists investigated whether establishing a weir (water control structure) at the southern end of the Parsnip Reach would be structurally and economically feasible. A field inspection of the site and an engineering evaluation performed by Ducks Unlimited revealed that a substantial and very costly structure would be required, whereas the benefits to wildlife and fish would be modest. Consequently, further project activities were cancelled.

Williston fish count shows positive results

A two-year, two-pronged study of Williston Reservoir, the largest body of fresh water in British Columbia, has taken research biologists a long way to better understanding the reservoir, its resident fish species and their habitat.

Peace/Williston Fish and Wildlife Compensation Program (PFWWCP) biologists Arne Langston and Randy Zemplak in 1999 and 2000 conducted biological and limnological (the scientific study of fresh water) assessments of the reservoir along with biologists from the University of B.C. and Environment Canada. The studies were designed to provide baseline conditions against which to measure future monitoring and to evaluate the effectiveness of large lake monitoring techniques developed for southern B.C. on this northern reservoir.

The results of the limnology were reported in the last issue of Natureline. They found that the reservoir provides a habitat that is nutrient poor. "The good news is that productivity levels appear to have stabilized," said Langston.

The biological component of the study focused on assessing fish populations in the pelagic (deep water) zone. Following up on other fishery investigations conducted in 1974/75 and 1988, it discovered that fish populations in the lake appear to have declined slightly, but, like their habitat, appear to be stabilizing.

Biologists conducted hydroacoustic and trawl surveys and concurrent gillnet sampling of the lake. Hydroacoustic surveys are similar to a submarine search, explained Langston. Sonar is used to measure populations in the pelagic zones of the reservoir, estimated at 80,160 hectares, or 57 per cent of reservoir surface area during August 2000.

Hydroacoustic estimates pegged the deep-water fish population at an estimated 5.92 million. Another two million fish may have occupied the near-surface (0 to 2.5 metre depth) habitat of Finlay Reach, bringing the total estimated population for the reservoir to eight million fish. Taken together with a similar acoustic survey in 1988, there is evidence that total populations in Williston Reservoir may have declined slightly over the past 12 years, said Langston.

Estimates put the current kokanee population at approximately one million fish, with a spawning population of between 40,000 and 90,000.

The whitefish population was estimated at about six million in deep water, and may be in the order of 10 to 11 million throughout the reservoir if they are as evenly distributed as indicated by 1975 and 1988 investigations.

Numbers of all other species, including rainbow trout and peamouth, were more difficult to assess, but likely account for less than 10 per cent of the total population of the pelagic zone, or less than one million fish.

Like the results of the limnology assessment, the biological study suggests a stabilization of populations, and provides good data for continued monitoring of fish populations, said Langston. "Long-term plans, management strategies and enhancement activities can now be based on a better understanding of the capabilities of Williston Reservoir."



Studies of the Williston Reservoir's fresh water habitat help biologists better understand fish populations.



Dave Conway, PFWWCP Communications, presents Mr. Mickey Finnigan of Prince George with the PFWWCP jacket he won for returning the entry form from the Winter 2003 edition of Natureline. Fill out the entry form at the bottom of the page for your chance to win this year.

Small lake stocking program increases angling options

One of the goals of the Peace/Williston Fish and Wildlife Compensation Program (PFWWCP) is to help maintain a healthy recreational fishery in the Williston Reservoir watershed. To this end, the program is involved with stocking and assessing a number of lakes within the watershed. Biologists are now busy re-evaluating the last stocking recommendations.

Bruce Lake, located about 23 kilometres southeast of Mackenzie, was originally stocked with 17,000 rainbow trout in 1989. A follow-up review in 1994 found very few fish, as they had already reached their maximum life span.

It was recommended that, because of the lack of trout spawning habitat, the lake be stocked with a sterile strain of fish. In addition, with the lake being a closed lake system (no outlet stream), the lake was suitable for other fish introductions.

Anecdotal information suggests Bruce Lake is heavily used in the winter, and brook trout provide a good winter fishing experience. Some 10,000 brookies were then initially introduced to Bruce Lake in 1995. Every three years after that, Bruce Lake was to receive another 5,000 sterile brook trout.

The next scheduled assessment in August 2002 found a healthy population of stocked brook trout, although the number of fish caught appeared to be low for the number of fish stocked. As a result, the stocking schedule for Bruce Lake has now been changed to 4,000 fish every second year, in order to reduce the number of low-catch angling seasons.

Dina Lake #2, about 25 kilometres northwest of Mackenzie, was stocked with 10,000 brook trout in 1984. A 1991 assessment showed good growth rates in the fish, and the lake is currently stocked with 10,000 brook trout per year.

A survey in the summer of 2002 continued to show good growth rates in the fish. A healthy population of fish still appear to be present, although net surveys resulted in lower than expected numbers of fish. Accurate angling pressure on the lake is not known. An aerial summer survey conducted on this and other Williston lakes in 2002 resulted in low angler use, while no assessment of winter fishing has been done.

Another possible reason for the low catch rate may be due to low oxygen levels in the lake. Dina Lake #2 is a fairly shallow lake and may be having a winter kill problem (in some years) due to low oxygen levels in the later part



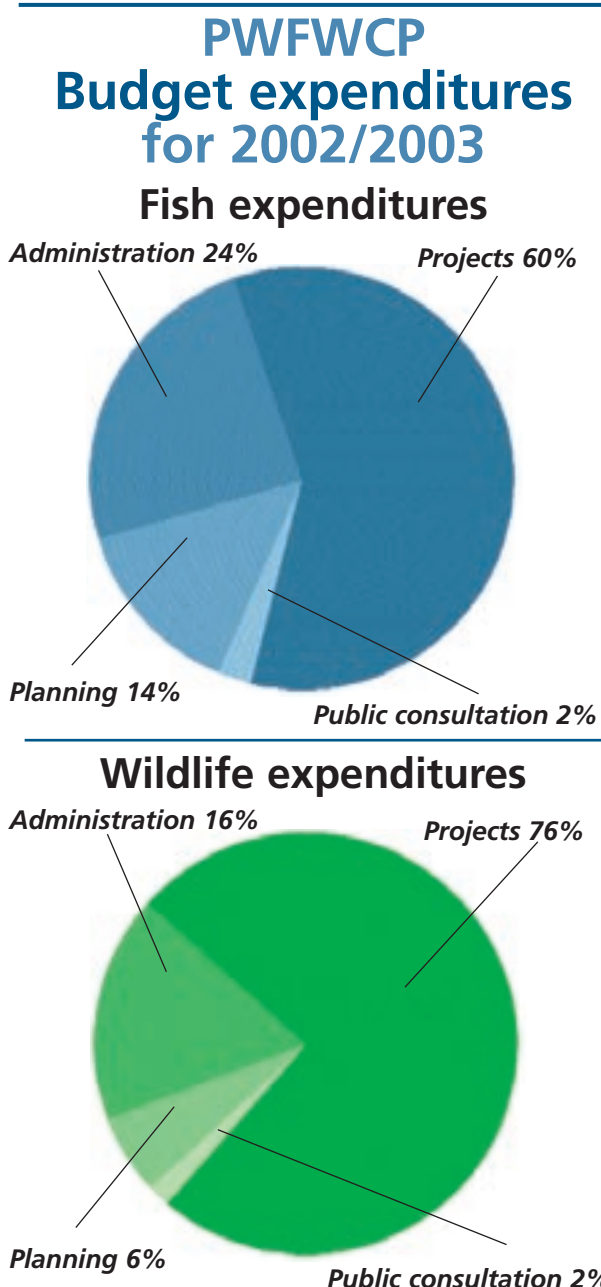
Stocking programs in a number of small lakes within the Williston Reservoir watershed have shown good growth and have contributed to a stronger recreational fishery.

What the PFWWCP program is about

The Peace/Williston Fish and Wildlife Compensation Program (PFWWCP) is designed to conserve and enhance fish and wildlife in the Williston and Dinosaur reservoir watersheds in north-central B.C. Launched in 1988, the program is a joint initiative of BC Hydro and the Ministry of Water, Land and Air Protection. It is intended to compensate for the impacts of the W.A.C. Bennett Dam, which was built on the Peace River in 1967, and the Peace Canyon Dam, which was built in 1980 about 23 kilometres downstream of Bennett Dam. The two reservoirs created by the dams control water from a catchment area of approximately 70,000 square kilometres, an area more than twice as large as Vancouver Island and slightly smaller than Scotland.

Since the program's inception, more than 200 projects have been undertaken, often with the help of volunteers. These efforts include the stocking of fish in barren lakes, improvements to wetlands, and studies of species as diverse as grayling, fishers and caribou.

In 1988 an original \$11 million fund was established to finance the program. By 2001 the fund had grown to \$23 million. It generates an operating budget of just over \$1 million annually and is managed to maintain the program in perpetuity.



of the winter. A study of winter oxygen levels is recommended for next year and may provide further answers.

Just 2.5 kilometres southeast of Mackenzie, Lost Lake was surveyed in 1993 and was found to be barren of fish. The PFWWCP, along with local volunteers, helped stock the lake with 2,500 eastern brook trout in 1995 as part of an attempt to develop a recreational fishery. It is currently stocked with 2,500 brook trout every second year and now supports a healthy population of what appear to be good-sized fish, according to an assessment conducted by PFWWCP biologists in 2002. It was recommended that the biennial stocking be increased to 3,000 sterile fish in order to increase the angling catch.

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