

Status of the Northern Leopard Frog in the Creston Valley Wildlife Management Area, British Columbia

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Key words: Creston Valley, northern leopard frog, *Rana pipiens*.

EXPANDED ABSTRACT

The northern leopard frog (*Rana pipiens*) occurs extensively throughout eastern North America, but has been more limited historically in the west. From the mid-1960s to mid-1980s there was a general decline of leopard frogs over much of their range. Sharp declines were noted in the late 1970s in the western provinces and states, with complete loss of the species at some sites. This species used to be found throughout the southern half of Alberta, but now there are apparently only 27 breeding locations. They are now limited to a small area of central Washington, and are gone from much of their range in Idaho. However, they seem to have made a minor comeback over the last few years in Alberta, Saskatchewan, and Idaho.

The records in British Columbia have been few and far between, with only about 12 historic locations in the Okanagan, Kootenay, and Columbia river valleys, and 1 introduced population on Vancouver Island. This species declined in British Columbia in the late 1970s, and by the mid-1990s was only known to occur near the town of Creston, south of Kootenay Lake. The northern leopard frog has been placed on the provincial Red List, and the British Columbia population is now considered to be endangered by COSEWIC (the Committee on the Status of Endangered Wildlife in Canada).

The Columbia Basin Fish and Wildlife Compensation Program (CBFWCP) funded a pilot project in 1996 to determine the status of the northern leopard frog in the Creston Valley Wildlife Management Area. This study found 3 males calling at 1 breeding site, and 4 frogs throughout the summer. In 1997, the CBFWCP began funding a 3-year project with the following objectives:

1. determine the distribution and abundance of leopard frogs in the management area;
2. establish whether this population is breeding successfully, and what habitat they require to do so;
3. identify and describe overwintering sites; and
4. provide management suggestions based on the information collected.

We are now at the start of the third year of this study.

We split the field days between the spring, summer, and fall active seasons. In spring, we did calling surveys to find out what habitat the frogs preferred for breeding, and to count the number of mature males. We did visual encounter surveys in all the sessions, to look for egg masses and tadpoles in the spring, metamorphic juveniles in the summer, and adults all year. When we caught frogs, we weighed and measured them, tried to determine their sex, and drew their spots for future identification. We also recorded information about the surrounding habitat, such as plant species, plant heights, temperature, and distance to water. In 1997 we also used minnow traps, and pitfall and drift-fence arrays, but they were not very successful for the effort required. It turned out that the design of the pitfalls allowed the frogs to escape, and the amount of time it took to install and check them was better spent walking around and looking for frogs. In the fall of 1998 we used radiotelemetry to track some of the frogs.

We caught 37 frogs in 1997—more than we expected, based on the number seen in 1996—and we caught another 116 frogs in 1998. We did not sample in the summer of 1998 so we could spend more time looking for frogs and tracking radio-tagged frogs in the fall. There did appear to be more frogs around in 1998, but we had also become better at finding frogs and were spending more time in the field looking for them. However, we did catch more frogs per unit effort (0.07 new frogs/person-hour in 1997, 0.17 in 1998). The recapture rate of marked frogs was 3% from 1997 to 1998 (only 1 frog marked in 1997 was recaptured in 1998). Low recapture rates are not unusual in herpetological studies, and we only marked 37 frogs in the first year, so this low recapture rate is not entirely unexpected. We tended to see the same frogs from 1 day to the next, and we would see individuals

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again a few weeks later, so we feel that the act of catching the frogs did not affect their survival.

We found calling males at 2 locations in the marsh in both years, and in 1997 we found an egg mass in the spring, metamorphic juveniles in the summer, and young of the year in the fall. In 1998 we found a pair of adults in amplexus, 3 egg masses, tadpoles in the spring, and young of the year in the fall. The egg masses and tadpoles were found at 1 of the breeding sites only, so we do not have evidence of successful breeding at the other calling site. There were definitely more males at the breeding sites in 1998 (6 captured in 1997, 29 in 1998), although we were at the site at slightly different times each spring and so might have missed the bulk of the calling males in 1997.

Most of the males at the calling sites in 1998 were much smaller than the males in 1997. They were probably born in 1996 and were breeding for the first time, and many of the larger males from 1997 likely did not survive through the year to breed again in 1998. It is possible that the generations in the population are barely overlapping, and we are seeing a turnover in the population from mostly older to mostly younger frogs. The young of the year in the fall of 1998 were much larger than those in 1997. This is probably because the breeding was earlier in 1998 and the summer temperatures were hotter, giving the juveniles more time to grow before the fall. However, we found proportionately fewer frogs that were obviously young of the year in 1998.

We attached radios to 14 frogs in the fall of 1998 (no more than 6 frogs at one time). We recorded a total of 189 frog-days (i.e., number of days a frog carried a radio added up for all frogs) and 110 locations, which gave us some interesting information on the habitats the frogs use in the fall. For example, 1 frog moved through a stand of cattails (*Typhus latifolia*) and mud that we did not think frogs would use at all, while another was hiding under the roots of a bunch of cattails. A frog would often stay in 1 location for days, move 5–50 m away for a few days, then move back.

Over all, the frogs ended up at the edges of bodies of deeper water (water that deepened to over 1 metre), and were still there at the end of the study at the end of October. On cold mornings we would find some of the frogs completely

submerged in the water. Leopard frogs are known to hibernate underwater on top of the mud, and the frogs in Creston appeared to prefer water with vegetation along the bottom, with little or no current. The bodies of water appeared to be of sufficient volume to provide enough oxygenated water to the frogs over the winter. Three of the frogs eventually went down small mammal holes dug into the banks along the edge of the water, and were at least 10 cm below the surface. On warm days, we could find the frogs on the surface, but later in the fall, as the morning temperatures reached freezing, the frogs appeared to stay underground all day.

The only known population of northern leopard frogs in British Columbia is in an area managed for many species, some of which are also Red-listed. A balancing act is required to maintain the area to benefit all, and requires good knowledge of the requirements of those species. We know that the breeding habitats of leopard frogs are rare in the Creston Valley. They appear to need beds of spikerush (*Eleocharis palustris*) in shallow, open water, and the 2 sites where we have observed breeding activity are the only locations in the valley where we have found this habitat. Therefore, we need to know how to protect, enhance, and possibly create this type of habitat. Overwintering sites are also critical, and although the leopard frogs seem to be able to find the conditions they require in a variety of habitats, these sites must be considered in management practices. There are possibly 2 subpopulations in this marsh, 1 concentrated around each of the calling sites, and this must be determined, as it will affect how the population is managed. We need more information about the population size, as only 2 years of captures does not tell us whether the population is increasing or decreasing. We need to determine summer habitat use and spring daytime habitats, so we plan to continue with the radiotelemetry this year. There are ongoing searches in the Columbia Valley for other populations of leopard frogs and, while these have not been successful, there are many locations that have not yet been searched. We hope to continue public education about this species and encourage members of the public to report any likely-looking frogs to the British Columbia Ministry of Environment, Lands and Parks or the Conservation Data Centre.