

Accomplishment Report – 2002
Capshell Research at Lost Lake, Glacier National Park

Investigators

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The Rocky Mountain capshell (*Acroloxus coloradensis*) was discovered in Lost Lake in Glacier National Park (GNP) during the mid-1960's. The capshell is a tiny freshwater snail, a Pleistocene relic whose modern distribution is highly disjunct. The Lost Lake population is one of about a dozen that survived in North America. It is the only known population in the United States where the species is relatively abundant. Almost nothing is known about the biology, life history, and habitat requirements of this rare mollusk.

Purpose: This work was undertaken to assess the condition and status of the capshell population in Lost Lake. The project is co-funded by the NPS Fee Demo Program (\$25,000) and the Rocky Mountain CESU (\$20,000). The study commenced in June 2001; fieldwork will be carried out through October 2003.

Monthly water samples were collected for chemical analysis from June through October at the mid-lake site at two depths. The samples were analyzed for total phosphorus, total nitrogen, soluble reactive phosphorus, nitrate plus nitrite nitrogen, ammonium nitrogen, chlorophyll *a*, dissolved organic carbon and total organic carbon. A Hydrolab Surveyor was used to obtain water column profiles of pH, dissolved oxygen, temperature, conductivity and redox potential. One sample was obtained in September for analysis of metals. Secchi disk depths were determined on each sampling trip. Periphyton samples were obtained for chlorophyll *a* analysis at three shoreline locations (10 rocks per site) in July, August and September. Thermographs deployed at two shoreline locations indicated water temperatures ranged from about 21 degC to near 0 degC at 0.5 m depth.

Zooplankton samples were obtained with Wisconsin net hauls (5 m to surface) from the mid-lake site in June, August and October. Benthos was collected in August with a kick net from littoral areas where the limpets predominately occurred. Deep water benthic samples were collected with an Ekman dredge. All biological samples will be analyzed this winter.

The light/dark bottle technique was used at the mid-lake site in August and September to obtain an estimate of primary production. Two light bottles and 1 dark bottle were filled with lake water from each depth (1 m depth intervals from the surface to near bottom)

and then deployed via a buoy for incubation at the depth of collection. Changes in dissolved oxygen were measured by Winkler titration in August and by YSI dissolved oxygen meter in September. Profiles of photosynthetically active radiation with depth were obtained using a Licor photometer.

We surveyed the distribution of limpets by snorkeling in August and with SCUBA in September. The limpets were found mainly along the western and southern shores to a depth of about 1.5 m. Most were fastened to the underside of rocks and small boulders. Thirty limpets were collected and preserved in 70% ethanol for genetic analysis. Efforts are underway to obtain *Acroloxus* from other sites in the Rocky Mountains for genetic comparisons.

Approximately 45 brook trout (*Salvelinus fontinalis*) were gill netted from Lost Lake in August. The lake was historically fishless and it is believed the brook trout were introduced during the 1960's. The extent of brook trout predation on the capshell population is unknown. Stomach contents from captured fish will be examined this winter.

Capshell surveys will be continued in 2003 to refine estimates of their abundance and distribution in Lost Lake. Efforts are ongoing to obtain capshells from other Rocky Mountain locations for genetics studies. A completion report will be prepared and submitted by April 15, 2004.