

Monitoring Amphibian Breeding Efforts on the National Elk Refuge

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Preliminary Report, January 2015

Project Summary and Highlights:

Amphibians of the National Elk Refuge (NER) have been the subject of inventory and monitoring since 1998. This grant supported a final year of monitoring and reporting, with a focus on amphibian breeding effort at key sites.

In 2014, we documented successful breeding on the NER by all four native, extant amphibian species in Jackson Hole: boreal toad, Columbia spotted frog, boreal chorus frog, and western tiger salamander. As context, results from the on-going amphibian monitoring program in Grand Teton and Yellowstone indicate that 2014 was an excellent year for amphibian reproduction in northwest Wyoming.

Ponds on Nowlin Creek, as in past years, continued to host robust populations of spotted frogs and boreal toads. Spotted frogs produced a record high number of egg masses in 2014. Boreal toad numbers in the breeding congress at Nowlin Pond 4 were somewhat reduced from some previous years' highest numbers, but nevertheless produced massive numbers of tadpoles. Metamorphs of toads and spotted frogs dispersed in July and August to a variety of sites along Nowlin Creek.

At Romney ponds in July, we found amphibians absent from one previously productive site (Romney Pond 2), but there were abundant toad tadpoles and metamorphs at a nearby pond (Romney Pond 1).

Surveys along Flat Creek upstream from the National Fish Hatchery identified a few, small breeding sites for boreal toads and chorus frogs (2 sites each), one salamander site, and no spotted frog sites or occurrences. Some former breeding sites were dry, and some others were apparently unused.

Monitoring results from the NER in 2014 highlight the importance of the Nowlin Creek ponds for Columbia spotted frogs and boreal toads, and the patchy nature of amphibian distribution and abundance on the NER. The final report will provide a retrospective summary of amphibian inventory and monitoring results since 1998.

Progress to date:

Field work started April 1 and ended September 20, 2014; 36 days and 4 nights in the field. Most of the field work was conducted mid-April to mid-June.

Field data from 2014 have been compiled and are summarized here.

A final report (as per Objective 6 in the grant proposal) is in progress; I expect to complete it by the end of March 2015.

Report on Objectives for the 2014 grant.

Objective 1. *Determine the number of spotted frog egg masses produced at Nowlin Creek ponds (southern Refuge, Flat Creek drainage), and the onset date of egg deposition.*

	Number of spotted frog egg masses in 2014	Previous highest number and year it occurred
Nowlin Pond 1	139	135, in 2013
Nowlin Pond 2	11	not previously found
Nowlin Pond 4	41	58, in 2012
All Nowlin Ponds combined	191	176, in 2013

Starting date of egg deposition in 2014: April 9

Previous earliest start date: April 5 in 2004. Latest start date: April 25 in 2008.



Six spotted frog egg masses, 19 Apr 2014, Nowlin Pond 1

Objective 2. *Determine the number of adult boreal toads present at the peak of breeding at Nowlin Pond.*

Surveys occurred on five nights in May in 2014, between May 2 and 25. Egg deposition began approximately May 15.

Maximum number of boreal toads observed at Nowlin Pond 4 in 2014:

94 adult toads (night survey **May 22, 2014**).

Previous highest number was 158 toads on May 5, 2006; second highest yearly count was 131 on April 25, 2012.



Toad pair, 15 May 2014, Nowlin Pond 4.

Objective 3. *Monitor tadpoles at the Nowlin sites to determine if and when toad and spotted frog tadpoles reach metamorphosis. (Tadpole survival, locations of their favored habitat, relative abundance, and the timing of metamorphosis.)*

Boreal toad tadpoles were in great abundance (>10,000) late May-July at Nowlin Pond 4. Metamorphosis began in mid July, and toadlets dispersed away from the pond by late July. Many toadlets were found in late July and August in small bays and tributaries of Nowlin Creek, downstream of Nowlin Pond 4 and almost as far as the Flat Creek confluence.

Spotted frog tadpoles were observed in Nowlin Ponds 1 and 4, May - July, in much smaller numbers than toad tadpoles (which is typical). Maximum numbers seen on one day were about 200 tadpoles. Metamorphosis occurred early to mid August. At Nowlin Pond 1, most spotted frogs apparently moved upstream by late summer, along Nowlin Creek and spring creek tributaries.



Spotted frog in metamorphosis, 26 Aug 2014, Nowlin Pond 1.

Objective 4. *Monitor amphibians at the Romney ponds (northern Refuge, Gros Ventre River drainage), if possible, to determine if frog and toad reproduction still occurs in this area.*

Swan breeding did not occur and we were able to visit Romney ponds on July 17. We found no tadpoles at the former major breeding site, Romney Pond 2, and conditions looked unfavorable for amphibian breeding due to lack of shallow water. Romney Pond 1 hosted a huge number of toad tadpoles and metamorphs (<10,000) and we also observed few late-stage spotted frog tadpoles.



Mary Greenblatt surveying at Romney Pond 1, 17 July 2014.

Objective 5. *Survey sites in the Flat Creek drainage that previously supported amphibians, to determine if amphibians persist.*

We conducted surveys on 8 days May - August, from the National Fish Hatchery north to Peterson Springs, covering wetlands sites on both sides of Flat Creek that were surveyed in previous years. We found active breeding sites for boreal toads (2 sites, but few tadpoles), boreal chorus frogs (2 sites), and tiger salamanders (1 site). Some formerly occupied sites were dry and unsuitable; some other sites hosted no amphibians. No spotted frogs of any life stage were observed.

Objective 6. *Complete a report that: Assesses the 2014 monitoring results; puts the results in the context of data collected in previous years (1998- 2013) with tables, graphs, and maps; provides a summary of amphibian status on the Refuge with recommendations for future monitoring and habitat management.*

The report is in progress. Reviewing the NER's draft Comprehensive Conservation Plan last October provided some insights on how I should structure the amphibian report, with a focus on easy accessibility to important information for managers and planners in the main report, and more detailed information for biologists presented in appendices.

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