



An Otterly Successful Restoration

THE RETURN OF NORTH AMERICAN RIVER OTTERS

By John Erb, Nathan M. Roberts and Chris Dwyer

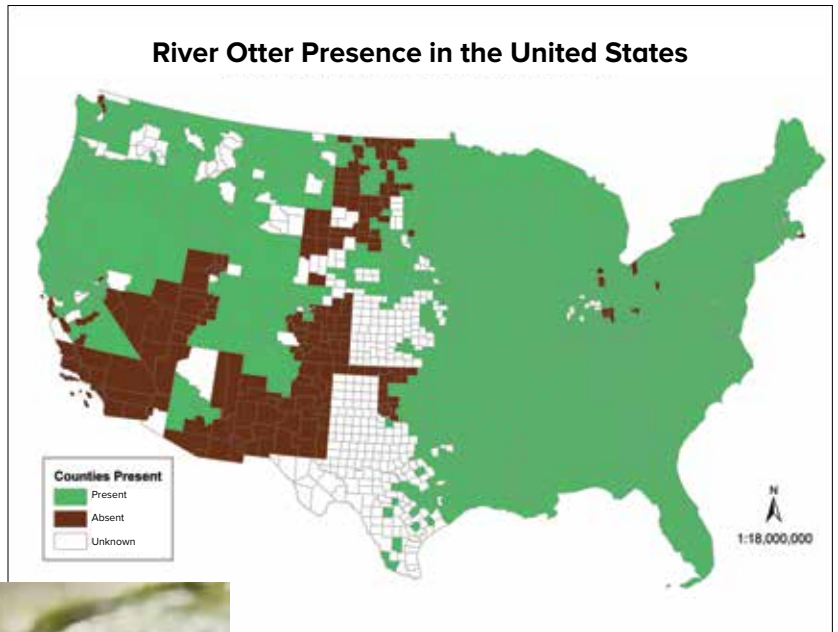
Severely impacted by changes in land use, destruction of wetland and riparian ecosystems, water quality issues, and unregulated trapping during the late 1800s, the North American river otter (*Lontra canadensis*) was reduced to less than 75 percent of its range by the early 1900s. But as a result of societal efforts to improve water quality in the 1970s — along with actions by natural resource agencies to improve habitat and implement modern, science-based harvest regulations — today the wildlife profession can claim one of its most successful wildlife recovery efforts.

A recent survey of all state wildlife agencies conducted by the Association of Fish and Wildlife Agencies indicates that these semiaquatic mammals endemic to North America have been restored throughout much of their historic range (2017). Of the 22 states that reintroduced river otters, populations in all but two continue to expand, while two other states report a constrained, but stable, reintroduced population. To get to this point, biologists captured a total of over 4,100 otters — starting in Colorado in 1976 and ending in New Mexico in 2010 — in areas where they were abundant and released them at various locations

where they were absent or no longer abundant to encourage recovery and restore the otter's range.

The road to recovery

One of the most important steps of the restoration efforts was eliminating factors causing the loss of healthy and abundant populations. State wildlife agencies conducted feasibility studies and developed recovery plans that included trapping, handling and post-release monitoring data for documenting reproduction, population in-



Source: Association of Fish and Wildlife Agencies



Credit: Tim Daniel/Ohio Division of Wildlife

◀ River otters are a charismatic species that has benefitted from improvements in habitat quality, establishment of regulations that are strictly enforced by State wildlife agencies and restoration efforts.

▲ The map shows the current distribution of river otters in the U.S. following reintroduction efforts and effective management programs.

crease, expansion and stability (Melquist et al. 2003) — many of which are still in use today to monitor post-release populations.

As reintroduced river otter populations started showing signs of success, agencies began to turn their focus from reintroduction and recovery to broader conservation efforts, including habitat and population monitoring and management. The success of these efforts is clear today: river otters are now found in all of the contiguous United States and



Alaska, with no state showing evidence of declining populations in the last decade (AFWA, 2017). In fact, populations are robust enough to provide limited and highly regulated harvest opportunities in 40 states and all of the Canadian provinces.

Next steps

Protecting, restoring and creating aquatic ecosystems on which river otters depend has been — and will continue to be — a key focus in the U.S. and Canada. As with any wildlife species, long-term persistence requires a sufficient quantity of suitable habitat. Achieving and maintaining this goal requires collaborative funding and effort on multiple levels, including from government agencies, conservation organizations and private individuals.

The revenues generated by sportsmen and women — either through direct hunting and trapping license sales or from Pittman-Robertson dollars generated by excise taxes collected on the purchase of hunting and sporting equipment — also provide a significant source of funding for aquatic habitat management that benefits river otters as well as other species such as aquatic and semi-aquatic mammals, numerous water birds, reptiles, amphibians, and fish. Another benefit that should not be overlooked is the recreational opportunities that come from restored waterways. These activities attract additional supporters for aquatic habitat restoration efforts.

However, we cannot lose sight of the challenges that remain. Preventing otter habitat loss or degradation and addressing emerging concerns related to invasive aquatic species and climate change will be key aspects of ecosystem management in the future. On the upside, we are now better able to map and monitor aquatic ecosystems cost-effectively — often in real-time — using various remote-sensing methods. Plus we have an extensive network of monitoring sites used to track water flows and various metrics of water quality.

During the long recovery effort, we've also learned one surprising thing. The success of populations on some landscapes has shown us that river otters can not only persist, but sometimes thrive in areas historically considered not pristine enough to support them.

Research needs

Targeted research is still needed to inform management and conservation decisions in the future. A cursory examination of a recent bibliography compiled by the International Union for Conservation of Nature's Otter Specialist Group suggests there are now over 1,000 publications related to some aspect of the ecology or management of the North American river otter. Although these publications give wildlife managers a significant amount of information for making scientifically based decisions, there will always be more to learn. Research by state

▶ Starting with Colorado in 1976 and ending with New Mexico in 2010, biologists captured over 4,100 river otters in areas where they were abundant and released them at locations across 22 states to help the species recover.



Source: Association of Fish and Wildlife Agencies



wildlife agencies, universities and others serves to improve our understanding of river otter ecology and is essential to informing future management decisions and prioritizing population and habitat management activities.

Population monitoring

Now that populations are doing well, a key focus of state wildlife agencies is monitoring them. River otters, like many carnivores, can be difficult to observe, individually identify, and capture and recapture — the common requisites of many population estimation methods. However, mark-recapture approaches using artificial biomarkers that require only one physical capture event or DNA obtained from remote, noninvasive sampling such as hair or scat collection, may be useful for estimating abundance. We will know more about these newer methods in the future as several jurisdictions are currently considering both approaches.

Some jurisdictions also employ population modeling to track or estimate otter abundance and to assist with decision-making related to harvest season parameters or research priorities. Models can vary in complexity, but so-called accounting models are often used. These models rely on estimates of age-specific birth and death rates obtained from research projects or from analyses of data on harvested animals.

In states with regulated harvests, a promising new approach to population estimation is statistical population reconstruction. Many states have ongoing work using this method because it produces estimates of abundance, survival and recruitment at substantially lower costs. The analysis relies on age-at-harvest data derived from teeth and effort data obtained from trapper surveys. Both data sources are easily collected and many state wildlife agencies already do so.

Empirical estimates of abundance, while valuable, are not often necessary or logistically feasible. Various indices of abundance already commonly used by wildlife managers also provide sufficient and reliable monitoring data if the indices come from carefully designed surveys. All states that allow the regulated harvest of river otters use at least one monitoring technique, but most rely on multiple techniques. Both harvest-dependent data — such as measures of catch and effort — and



Credit: Colleen Olfenbuttel/NCWRC

harvest-independent data— such as bridge and camera surveys — can provide data on the status and trends of river otter populations. Common harvest-independent methods include track/sign surveys from a network of bridge crossings on the landscape, transect or other targeted snow-track surveys by air or ground, and otter latrine surveys in wetland complexes or along riverine systems.

Practical, biological and statistical pros and cons exist for each monitoring approach. The most appropriate method depends on the landscape and project goals, the spatial scale-of-interest and funding. Increasingly, state agencies are considering approaches that allow for multiple within-season surveys to obtain detection-corrected estimates of otter occupancy.

So far, remote trail cameras have received little attention for otter surveys; but, they do have one thing in their favor: cost. Camera traps may work as a low-cost, multi-occasion survey tool when deployed at accessible stations, including bridges, high-use stations such as latrines or lured stations along waterways.

Harvest data

In states with regulated take, harvest levels across time sometimes serve as useful indicators of population change. But, the data are generally more reliable when combined with trapper-effort data

▲ North Carolina Wildlife Resources Commission Black Bear and Furbearer Biologist Colleen Olfenbuttel examines an anesthetized river otter captured in a foothold trap for a research project examining reproductive rates.



► Fish are the primary food item of river otters, but they are also known to feed on crustaceans, molluscs, frogs, insects, waterfowl and occasionally mammals such as muskrats and beaver.



Credit: Tim Daniel/Ohio Division of Wildlife

expressed as catch-per-unit-effort. This type of data offers both a low-cost and reliable population index, and, with time-specific effort and harvest data, it can be used to estimate abundance.

Biological data commonly collected by state agencies from harvested animals also provide demographic indices useful for monitoring populations or managing harvest. Many states collect information from carcasses that are useful for detecting changes in distribution or abundance, including reproductive metrics, sex/age ratios, genetic data, samples for diet or contaminant analysis and harvest location. As long as the limitations of each data category are understood, these data can provide a diverse picture of the status, health and distribution of otter populations through time, all for a relatively low cost.

Sound harvest management is another critical aspect of river otter conservation and usually involves ongoing communication between researchers and biologists conducting population and harvest monitoring surveys. Harvest data provide critical information for understanding how season parameters like timing, length and methods affect the nature of the harvest, allowing agencies to properly manage harvests and help sustain healthy populations and harvests levels.

Like other permitted harvests, wildlife management agencies need to be cognizant of social

concerns associated with river otter harvests, including animal welfare and trap selectivity. Over the past 20 years, a collaboration among trappers; state, provincial and federal wildlife agencies; and veterinarians has spent some \$40 million evaluating animal welfare, and trap efficiency, selectivity, safety and practicality. Recent surveys show that nearly all river otters harvested in the U.S. are taken in traps that meet the five criteria outlined by AFWA's trapping best management practices (2014). Continued collaboration with trappers regarding education and testing of new trap innovations will help address any societal concerns related to harvest.

Pelt exportation

Today, the Convention on International Trade in Endangered Species of Flora and Fauna, to which the U.S. is a signatory, lists the river otter in Appendix II. This list includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with the species' survival. It also includes species like river otters whose inclusion on the CITES Appendix II stems not from conservation concerns or threats to this species, but rather from their "look-alike" status with threatened otter species in other parts of the world.

As part of the U.S. Fish and Wildlife Services' CITES implementation policy, pelts from otters harvested in the U.S. and destined for export must be tagged, confirming both the species identity and legal acquisition when the pelt enters international markets. In addition, the CITES requires each exporting country to conduct an assessment to ensure that the harvest of river otters will not be detrimental to the overall survival of the species. To conduct this assessment in the U.S., the USFWS compiles and reviews population, harvest, and other management data or plans from states that allow harvest. The data have consistently confirmed that modern regulated harvests have not been detrimental to the survival of the species.

Reflecting on success

By any measure, otter conservation efforts over the last four decades have been a tremendous success. By the late 1990's, river otters were present in approximately 90 percent of their historic range, a number that has undoubtedly grown since then. And, thanks to research, surveys and collection of



biological data from harvested animals, a wealth of information is now available on otter ecology.

Today, the International Union for Conservation of Nature considers the North American river otter a species of least concern and stable, while finding the remaining 12 species of otters occurring elsewhere in the world near threatened and declining at best.

Now recovered throughout much of its range, the river otter is a true conservation success story and one of the greatest in the history of wildlife management. Its successful recovery is a testament to the commitment and efforts of many conservation enthusiasts, including trappers, biologists, citizens and stakeholder organizations. Because of their focus on shared goals, populations are doing well in vast areas of North America where not long ago populations had dwindled and otters had even disappeared.

No doubt new challenges will emerge in the future. But with continued monitoring of current populations and harvests, and continuing research, we need not let the past dictate the future. ■

Disclaimer: The findings and conclusions are those of the authors and do not necessarily represent the views of the USFWS.



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