

Research on North American River Otters in Kentucky: Recovery, Ecological Impacts and Population Dynamics

by M. J. Lacki and E.E. Barding

Introduction

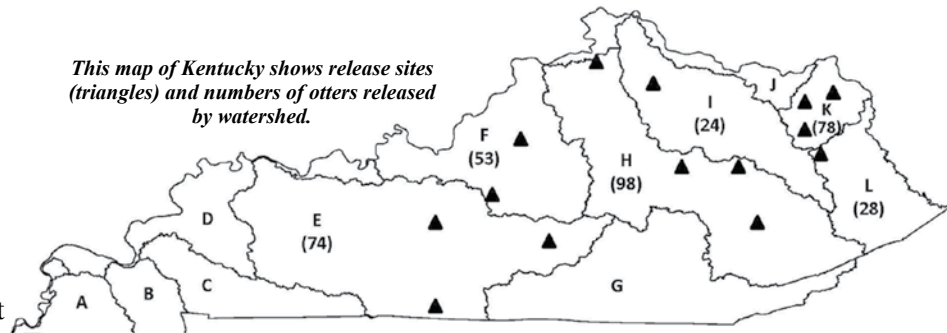
Once reduced to sparse numbers in the western end of the state, river otters (*Lontra canadensis*) are now being seen and enjoyed by Kentuckians once again as part of the wildlife fauna across the Commonwealth. Success of this species recovery is due to reintroduction of river otters by the Kentucky Department of Fish and Wildlife Resources (KDFWR) across multiple locations and years in central and eastern Kentucky (Figure 1). Otters can inhabit any body of water, including lakes, ponds, rivers, and streams. This habitat flexibility has caused the growing river otter population to come into conflict with fish hatcheries, landowners, and sportsmen concerned over the possible negative impacts on the ecology of aquatic systems and sportfish populations. To this end, the KDFWR has been working with Dr. Michael Lacki, a professor in the Department of Forestry, and Dr. Erin Barding, a recently graduated Ph.D. student at the University of Kentucky, in examining the biology and ecological impacts of river otters in Kentucky.

Approach

We used damage reports, sign surveys, and harvest data to evaluate the distribution and status of the river otter in Kentucky. Data were gathered from annual reports submitted to KDFWR by Wildlife Control Operators, biologists, and conservation officers. We conducted bridge-crossing transect surveys from May to October over a three-year period to locate otter sign across all 12 primary watersheds in the state. Harvest data from experimental and statewide trapping seasons were gathered and provided to the project by KDFWR personnel. To assess diet, evaluate reproductive poten-

tial, and model population dynamics of river otters in Kentucky, carcasses of river otters were collected with the help of KDFWR biologists and a subset of Kentucky trappers during statewide harvest seasons. We performed necropsies (the animal equivalent of an autopsy on humans) on carcasses of river otters and removed stomach contents to identify important prey groups. We removed ovaries and reproductive

This map of Kentucky shows release sites (triangles) and numbers of otters released by watershed.



Dr. Mike Lacki

tracts from female otter carcasses and looked for evidence of successful reproduction. We developed models of population growth of river otters using Kentucky-specific pregnancy rates and litter sizes, and adult survival rates of river otters from Tennessee, Missouri, Kentucky (western end only), and West Virginia.

Findings

We found sign of river otters during transect sampling efforts in 9 of the 12 primary watersheds in Kentucky. The three watersheds where we did not observe any sign of river otters were all in the far eastern region of the state. Relative to watershed acreage, a high abundance of otter sign was observed in the Licking, Lower Cumberland, Mississippi, Tennessee, and Tradewater River watersheds. Not surprisingly, these are also the same watersheds where harvest of otters by trappers has been most successful. The majority of nuisance complaints reported to KDFWR were depredation of fish in farm ponds and damage to boats and docks, with complaints received from all watersheds across the state. Complaints decreased dramatically, however, following the initial statewide harvest of otters in winter 2006-2007.

We examined 126 stomachs of river otters collected over three trapping seasons. Diet of



River otters can now be observed across Kentucky because of recovery efforts.

Photo courtesy: John Cox

river otters did not vary between males and females, adults and juveniles, or otters from the western and eastern halves of the state. Fish and crayfish were the main prey, occurring in 86 percent and 27 percent of stomachs containing prey items. The most frequently consumed group of fish by percent occurrence in stomachs was sportfish, including sunfish, crappies, and black bass (36%). This was followed by suckers (11%), minnows (11%), and shads (7%). Of the sportfish, sunfish and crappies occurred at a higher percent occurrence in the diet of otters than did black bass species (only 5%). The low percentage of black bass species in the diet of otters would suggest limited impact of otters on these more important sportfish. Nevertheless, further monitoring of otter predation on black bass species is needed because our samples were limited to only the winter harvest season, and we still do not know what otters eat during the summer months in Kentucky. We observed rare crayfish species in the diet of otters, including a species of concern and a state threatened species, suggesting that predation by river otters has the potential to affect populations of rare species of crayfish. Further, given that crayfish contents in many stomach samples could not be identified to the species level, it is likely that evidence of predation on rare crayfish in our study was underestimated.

We performed necropsies on a total of 170 river otters. The pregnancy rate for adult females (≥ 2 years in age) was 0.72, and the average litter size equal to 3.14. There was no regional difference in reproductive rate of otters in Kentucky. Although some otters were found to be 10 years in age, the population of river otters in Kentucky currently has a very young age distribution, suggesting potential for growth in the statewide population size. The models estimated the size of the female population of Kentucky's river otters in 2010 to equal 14,670 (Tennessee inputs), 3,618 (Missouri inputs), 1,110 (LBL inputs), and 140 (West Virginia inputs), respectively.



River otters are highly adaptable and are comfortable on land and in water. They hunt mostly at night with some of their favorite meals consisting of fish, frogs, turtles, and crayfish. River otters can dive to a depth of 60 feet and stay underwater for several minutes.

Future Implications

Results of research to date confirm that the recovery of river otters to Kentucky is well on its way to success with evidence of otters (sign, damage reports and/or trapper success) found in all 12 major watersheds. Otters continue to be less abundant in the far eastern regions of the Cumberland Plateau and Cumberland Mountains, and it is unclear if present habitat conditions in the east are less suitable to otters. The vegetation and habitats across Kentucky have been highly altered from their original condition due to human settlement, and existing conditions likely affect reintroduced otters differently than those that were present pre-settlement. Surface mining has produced open habitats and alterations in land form that have affected shape and form of drainage basins and water quality in many areas of Kentucky. More studies are needed to determine how river otters in Kentucky select from among the habitats available to them across the landscape.

Dietary studies demonstrate that river otters in Kentucky do prey on sportfish and on some rare and threatened crayfish. Consumption of fish species such as black bass, rock bass, sunfishes, and crappies by river otters remains a management concern. Winter diets of otters suggest these carnivores may not be significantly impacting some sportfish populations, but research on summer diets of otters are needed to confirm or refute this hypothesis.

Population models predict large differences in the future abundance of river otters in Kentucky depending upon which survival rate is used in calculating population projections, and statewide Kentucky-specific survival rates are needed to improve the accuracy of model predictions. Regardless, the continued success of otter harvests indicate a healthy growing population, and the KDFWR is now evaluating modifications to the harvest schedule to increase harvest rates in portions of the state where river otters are more abundant.



The next time you are near a water body look for river otter tracks in the wet sand or mud.

About the Authors:

This research was funded by the Kentucky Department of Fish and Wildlife Resources and was conducted as a Ph.D. research project by Erin Barding, Ph.D., who is currently an assistant professor at North Georgia College and State University. The research was conducted under the direction of Dr. Mike Lacki who is a professor of Wildlife Ecology and Management at the University of Kentucky Department of Forestry.

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