

# **The Case for River Otter Restoration**

## **in New Mexico**

A Report to the River Otter Working Group

Melissa Savage and Jon Klingel  
The Four Corners Institute  
Santa Fe, New Mexico

### **Bring back the otter**

The river otter dives in a deep clear pool in the stream, a long line of bubbles rising to the surface as she expertly chases a shimmering catfish. On the bank, two otter cubs roll and tumble in the willow thickets. In this otter family, only the cubs were born in this place. The mother was part of a river otter restoration project to return these mammals to places that they inhabited before trapping and other pressures caused their extirpation. In many states where otters survived or where restoration programs have been initiated, this scene is common along streams and rivers, swamps and wetlands.

For thousands of years, river otters were a part of the natural environment of what is now New Mexico. As a top predator, the animal at the top of the food chain, otters play an important role in the balance of prey populations in aquatic ecosystems of rivers and streams. They thrive where there is clean water, abundant food, and protected places to den and rest.

But river otters probably no longer live in New Mexico. There has been no confirmed evidence of otters in the state since 1953. Since the animal is large and active, and there is extensive human use of New Mexico's rivers, it is likely that if there were any otter remaining in the state, they would have been noticed during the past fifty years. River otters have now been restored to every state from which they were extirpated except New Mexico (Raesley 2001). The time has come to bring the river otter back to the rivers and streams of New Mexico.

### **Otters in New Mexico**

The historical distribution and abundance of river otters in the Southwest is largely unknown. Otters were abundant enough in the rivers and streams of New Mexico to have been documented many times in the diaries and journals of early travelers in the region. Reliable reports in historical documents of river otter in New Mexico exist for the upper and middle Rio Grande, and the Mora, Gila, and Canadian River drainages (Polechla 2000). Other documents indicate that otters possibly occupied the San Juan River drainage in northwestern New Mexico (Polechla 2000).

The value of beaver pelts throughout the 19<sup>th</sup> century and the popularity of trapping beaver led to trapping of river otter as well. So heavily were these animals trapped in New Mexico that even the Mexican authorities took notice. In 1838 the departmental junta of Chihuahua acted to protect both beaver and river otter along the Rio Grande by declaring a six year moratorium on trapping of the two species (deBuys 1985). deBuys called this act “one of the first conservation measures in the North American West” (1985).

Despite this early attempt to protect furbearers, trapping pressure on them continued throughout the 1800s. By 1890, beaver were regarded as “practically extinct” in New Mexico (Huey 1956). The season on beaver trapping was closed in 1897. The less abundant river otter populations were even more depleted than those of beaver. By the 1950s, declining beaver pelt prices combined with efforts to recover the population, including transplants and closed trapping seasons, made a beaver comeback possible (Polechla 2000). But the damage to the river otter populations was done. River otters apparently had declined to a point of no return.

Over-trapping of otters for their pelts had the earliest and biggest impacts on river otter populations, but other changes in the environment continued to take a toll. Water quality in the state declined throughout the 20<sup>th</sup> century, with soil erosion and pollution resulting from overgrazing, timber cutting and mining in some areas. Water quantity in rivers also dropped in many areas because of agriculture and water development.

The last definite documented evidence of a river otter in New Mexico came in 1953 in the Gila River. ‘Shorty’ Lyon, a government trapper, found a dead otter in a beaver trap he had set on the Gila River southeast of the town of Cliff. This animal provided the first and last preserved physical evidence of the species in New Mexico. Since then, there have been unverified sightings, but no concrete evidence of otter occupation (Polechla 2000). Bailey’s 1931 report of river otters in the upper Rio Grande is considered the last reliable evidence for the entire river.

No river otter presence has been confirmed in New Mexico since 1953. While the possibility exists that there may be a few remaining animals, it is remote. Considering the extroverted antics of otters and the number of people near streams for fishing and rafting in the state, it is doubtful that there are otter populations that have escaped detection. Polechla (2000) states, “Either the river otter has a remnant population so small that it can not be detected by the methods used or the population is now

extirpated.” Systematic surveys will be needed to document the presence or absence of any relict populations and to confirm the status of river otters in the state.

### **The Southwestern river otter**

The species that inhabits the U.S. and Canada is the North American river otter, *Lontra canadensis*. The original populations of the river otter in the Southwest may have been a subspecies, *Lontra canadensis sonora*. A subspecies is equivalent to a “race”, which is a population that has unique characteristics that are specifically attuned to the local environment. Southwestern otter populations were never very abundant, since water is sparse, and only a few specimens from the region have been available for comparison with specimens from elsewhere across the continent.

Based on three otter specimens, all from Arizona, a designation of the subspecies *sonora*, the Southwestern river otter, was made in 1898 (MacDonald 2002). The extent of the original distribution of the proposed subspecies in the region is unclear. The validity of a southwestern subspecies, however, has been questioned based on the small number of specimens from the area. In the late 1980s, when *L. c. sonora* was considered for endangered status, Bates (1988) determined that there was insufficient evidence to support the existence of a separate subspecies. The taxonomic validity of the subspecies designation is currently being tested using DNA analyses on the specimen collected from the Gila River. The case has not yet been convincingly made that the New Mexican otter is a valid subspecies.

River otters are considered extirpated by the New Mexico Department of Game and Fish. If surveys in the state were to locate any remaining native animals, the status of river otters would likely change to endangered, and the goals and implementation of a restoration plan would likewise change. Until actual evidence of otter occurrence is produced, however, the existence of otters in the state remains speculative (Polechla 2000)

### **River Otter Ecology**

The river otter is a swift and strong semi-aquatic predator that thrives wherever there is enough clean water and an adequate food base. Otters use water for hunting for food, cavorting, traveling, and as a refuge from danger. Riparian ecosystems, where willows and other wetland and streamside plants grow, make good homes for otters, whether along desert streams or mountain freshets. Their lithe, streamlined shape, powerful tails, and webbed feet make them expert swimmers and divers. Dense, glossy brown fur, with longer guard hairs, keep them warm and dry in icy winter waters. They are primarily active in the day, and can sometimes be seen playing and hunting in the morning and late afternoon.

Otters thrive in habitat with slow-moving water and deep pools, good riparian vegetation, and abundant fish or crayfish. They can tolerate relatively low water flow, perhaps as little as 10 cubic feet per second, if other important habitat conditions are

good, such as the presence of pools, good water depth, ice-free stretches in winter, and access to shoreline (Fitzgerald et al. 1994).

Otters have broad tastes, and eat a wide variety of fare. Fish are usually the primary food item in the otter diet, but they love crayfish, which can comprise the majority of the otter diet where abundant. They also may occasionally eat frogs, insects, and aquatic birds (Fitzgerald et al. 1994). Slow-swimming fish, such as carp, chub, and catfish, are more commonly eaten than faster fish such as trout (Chapman and Feldhamer 1982, Fitzgerald et al. 1994). Otters are successful hunters even in seasonally turbid waters, such as the Dolores River in Colorado (Fitzgerald et al. 1994).

On the banks of their home streams, river otters depend on plant communities to provide protection. Riparian vegetation, such as willow thickets, cottonwood trees, tree root tangles, downed logs and other debris, rushes and cattails, even non-native plants such as Russian olive and Siberian elm trees, provide places for hiding and denning. Dense brush near streams is used in spring to protect the young from predators. Branches and other plants that hang over streams shade the water, and produce cooler water temperatures that may be favored by fish on hot summer days (Herreman and Ben-David 2002). A healthy riparian vegetation community is essential for cover when otters are on the bank. In return, the otter inadvertently fertilizes streamside plant communities by depositing nitrogen from fish in their scat (Ben-David, cited in Crait 2002).

Otters are often found in beaver country. The river otter shares its river habitat with raccoon and muskrat as well (Polechla 2000), but it is the presence of beavers that is uniquely helpful for otters' lifestyle. By damming streams, beaver create the deep, fish-rich pools that otters prefer for fishing. Pools also provide sanctuary for otter when other waters dry up seasonally. Otters also use abandoned beaver dens, especially abandoned lodges and dens carved into river banks. Beavers increase the potential for otter success by increasing feeding and denning sites. As beaver populations have rebounded in the state, they have restored high-quality otter habitat.

There are few predators on river otter in the water, but they are more vulnerable away from the water, where they move in a less fluid, bobbing way. On dry land, bobcat, coyotes, cougars, foxes, and dogs have been known to kill otters (Chapman and Feldhamer 1982). Still, otters are remarkably strong and agile for their weight, and can muster a potent defense. In areas of high human density, otters are primarily killed by dogs and highway traffic (Beck, pers. comm.).

Otters are social animals, and often remain in family groups that play and hunt together. They breed in early spring, with litters averaging 2 to 4 pups. Cubs begin to try the water at around 6 weeks, but must be coaxed into the water and helped to learn to swim by their mothers (Chapman and Feldhamer 1982). Cubs and mothers often stay together for over a year (Melquist and Hornocker 1983).

Playfulness is a well-known and appreciated characteristic of river otters. Otter groups can often be seen frolicking and cartwheeling underwater, apparently for the sheer pleasure of it. Tobogganing down slippery banks and on snow slopes on their

bellies is a famous otter pastime. Perhaps no other mammal seems to us to play as intently and as joyfully as the river otter.

### **Restoration in other states**

By 1980, North American river otters had disappeared from 11 states, and were in severe decline in 9 other states (Raesley 2001). During that decade, however, a shift occurred in management philosophy, and managing for sustainable river otter populations became the goal in many states. Twenty-one states implemented otter restoration programs between 1974 and 1998 (Raesley 2001). In some of these states, there were no remaining river otters when the restoration programs were initiated, but in most, there were small populations of otters still present when releases were made (Raesley 2001). Otters have also been reintroduced on Santee Sioux tribal land in South Dakota (Raesley 2001).

River otters are highly mobile and when reintroduced into suitable habitat, are often highly successful in repopulating adjacent stretches of river. They are effective pioneers, and readily move into parts of rivers where habitat is good. They are even capable of traveling overland for some distance, to disperse into other watersheds.

Perhaps the most successful river otter restoration program so far in the United States has been in Missouri, where rivers and streams are abundant. A restoration program in the 1980s and early 1990s resulted in an otter population of over 11,000 animals by 1999 (Chambers 2001). Crayfish have dominated the diet of Missouri otters in summer, and fish in winter, and otter predation may have decreased warm-water game fish populations in smaller streams in the Ozarks (Kruse, pers. comm.). Fortunately, warm-water fish in New Mexico are found primarily in reservoirs, which otters avoid because of the lack of vegetation cover.

In the Southwest, Colorado, Arizona, and Utah have had otter restoration programs. In Colorado, between 1976 and 1992, otters were reintroduced into the headwaters of the Colorado River in Rocky Mountain National Park, and into the Dolores, Gunnison and Piedra Rivers, where they survived and reproduced (Fitzgerald et al. 1994). Studies conducted in the mid-1990s in Rocky Mountain National Park suggest that otter populations there are now at carrying capacity—the highest possible number of otters given the amount of food and habitat available. More intensive surveys, conducted in 2001, estimated that there were 18 otters along the Colorado River within the boundaries of the Rocky Mountain National Park (Herreman and Ben-David 2002).

Otters were successfully introduced into the Verde River drainage in Arizona by the Arizona Game and Fish Department, through a reintroduction from 1981 to 1983. A self-sustaining population now exists in the Verde River watershed (Van Pelt, pers. comm.). Otters were also released into the Green River in Utah between 1989 and 1990 (MacDonald 2002), and there is now a viable population in the Green River above and below Flaming Gorge Dam (Haschlke and Ben-David 2002).

Otters for these southwestern restorations were obtained from widely disparate

places. Colorado used otters from a number of states, primarily from Oregon, Minnesota, and Wisconsin, but also from Alaska, Washington, California and Newfoundland. Arizona released otters originating in Louisiana. The otters released into southwestern states, thus, have not been the proposed subspecies *L. c. sonora*.

### **Issues of Concern**

The river otter shares a love of fish with anglers. Sport fishermen may be concerned that the otter would compete with them for fish, and the otter has sometimes been erroneously blamed for the depletion of game fish, especially trout. Scientific studies have demonstrated that the bulk of otter diet is nongame fish species (Tesky 1993). Otters take the most leisurely hunting approach, eating the most easily captured fish. The main stay of otter diet is slow-moving nongame fish such as suckers and carp with occasional faster fish (Melquist and Dronkert 1987). When available, otter will eat a diet almost entirely composed of crayfish (Chambers 2001). Where they have been reintroduced into the Dolores River in Colorado, for example, otters have made extensive use of crayfish (Fitzgerald et al. 1994). In fact, river otters are considered beneficial to game fish in many circumstances, since they eat crayfish and nongame fish that compete with game fish (Chapman and Feldhamer 1982, Tesky 1993).

The protection of endangered fish populations that inhabit portions of the state's rivers is a priority. However, two species of concern, the Rio Grande cutthroat and the Gila trout, are fish that typically inhabit the headwaters of streams and rivers (Peroz, pers. comm., Propst, pers. comm.). The best otter habitat, on the other hand, is downstream from the headwaters, where both water quantity and prey base are more abundant. Potential conflict between otters and spikedace and loach minnow is also unlikely because otters prefer to hunt in deep pools, and these fish inhabit shallow riffles (Propst, pers. comm.). Any potential issues with other fish species of concern need to be considered and addressed.

Another possible issue is that reintroduced otters might incidentally get caught in traps set for other mammals, particularly beaver. Trappers need to be assured that the incidental trapping of an otter will not create problems for them, and that there will be a management policy in place to deal with this possibility. However river segments proposed for otter restoration in New Mexico tend to be remote, such as the upper Gila River and Rio Grande gorge, where the potential for trapping conflict is low. Accidental trapping of otter can also be reduced by the use of a new trap trigger that allows otters to swim through traps unharmed (Beck, pers. comm.). Fencing of fish hatcheries, now planned for facilities in the state as protection from other threats, would also prevent conflict with river otters.

Will riparian plant communities need rehabilitation before river otter restoration? The answer to this question is that while otters need streamside cover, they have a wide tolerance for vegetation community type and condition. Although they spend a lot of time out of the water, using river bank communities for denning and resting, almost any kind of continuous vegetation--willows, tall sedge, rose thickets, cattail sloughs, even exotic non-native plant species communities—provide adequate cover.

## **Benefits of river otter restoration**

The return of the river otter to New Mexico rivers means we will once again share our incomparable natural home again with this rare and delightful animal. Locals and visitors taking a quiet evening stroll by the banks of the Rio Grande might be surprised and enlivened by the splashing of a family of otters.

The presence of river otter in our southwestern streams will help restore the biological balance of our rivers. Crayfish are not native to any of our waterways from the Pecos River west. Crayfish populations, for example, have become established in the Rio Grande, the San Juan, Gila and San Francisco Rivers to the detriment of native fish and insect populations. Crayfish harm the natural balance of river faunas by preying on both young fish and fish eggs, and other wildlife, such as Chiricahua leopard frogs and newborn garter snakes (Fernandez and Rosen 1996, Childs 1999). Where crayfish have been introduced to waterways of Arizona, flora and fauna have been devastated, and water turbidity and siltation have increased (Fernandez and Rosen 1996).

Otters also tend to eat the slower, more abundant fish species, which in the proposed restoration sites, are primarily non-native fish. The white sucker, for example, a non-native fish in the upper Rio Grande, is the single most abundant fish in that stretch of river. This undesirable non-native hybridizes with the native Rio Grande sucker, a Forest Service "sensitive" species. The most abundant fish species in the proposed restoration site in the upper and lower Gila River and San Francisco River, are non-native as well (Propst, pers. comm.). In Missouri, restored otters were found to prey heavily on fish in winter and crayfish in summer (Hamilton, pers. comm.). Otter predation on non-native fish and crayfish populations will help create and maintain more natural conditions in aquatic populations..

The return of the river otter will mean different things to different people. The fisherman may see a predator that can help restore a balance in the aquatic fauna by reducing the number of non-native fish and crayfish that prey on young native fish species. River tour guides may see the addition of an elegant, playful animal that will delight and captivate their clients. The otter is a furbearer, and if restoration efforts are very successful, the otter may in time offer a season to trappers. The conservationist may see the return of a key ecological component of a healthy river. The visitor may take away a cherished memory of an afternoon watching the antics of an otter family.

## **Why river otter restoration now?**

This is an excellent time to initiate a river otter restoration program in New Mexico. The decline of river otter populations in New Mexico was largely due to the effects of human activities in the past, mostly in the distant past. Uncontrolled trapping no longer occurs here. The boon compatriot of the otter, the beaver, is again busy in the waterways of the state damming pools and building dens. Rivers are cleaner as pollution management improves, and overgrazing of grasslands and forests has declined. Along

the Rio Grande, and other streams and rivers of the state, riparian communities are being restored to healthier conditions and provide protection for other wildlife species.

A river otter restoration program need not be a complicated task. Animals for a restoration program are expected to be readily available from abundant populations in other states. Otters would not need intensive management efforts where potential for conflict with humans is low. Releases in other nearby states have usually consisted of one-time releases of a number of otters at one or more suitable sites, with relative low program costs.

Potential otter habitat in the state includes rivers where there is enough water to provide adequate otter habitat, such as the upper Rio Grande, the San Juan River, and the Gila and San Francisco River drainages. In addition, extensive stretches of those waters are protected by wilderness status, or land management by Forest Service and Bureau of Land Management or tribal governments. Long continuous stretches of river otter habitat with an adequate water and food supply, exist in New Mexico.

In those places where restoration is being considered, surveys need to be undertaken to identify the best possible otter habitat. A survey of the upper Rio Grande has already been completed (Polechla 2000), which found that otter populations could indeed live in a long stretch of river from the state border to Espanola. In Idaho, river otter densities were observed to be one otter per 1.7 to 3.7 river miles (Melquist and Hornocker 1983). Using these density values, the approximately 265 river miles of suitable habitat within the proposed restoration sites in New Mexico might support an estimated 70 to 160 river otters.

Much of the upper Rio Grande is a good river otter restoration location because it is protected from human disturbance by its remoteness and its deep canyon. A 48-mile stretch of the Rio Grande was designated as a Wild and Scenic River in 1968, lending an additional level of protection to the area. Thirty miles of the Chama River, whose confluence with the Rio Grande occurs at Espanola, also provide excellent otter habitat. The Gila and the San Francisco Rivers, in Southwestern New Mexico also appears to have good otter habitat. Grazing pressure in this watershed has declined in recent years, and riparian areas and water quality are recovering. The upper stem of the river is protected by wilderness status, while most of the middle and lower Gila River boxes are managed by Forest Service or Bureau of Land Management. Since nonnative fish and crayfish dominate these systems (Propst, pers. comm.), otter presence may potentially contribute to the integrity of the aquatic ecosystem. The San Juan River offers a high volume of water, a high density of non-native catfish and carp, which are detrimental to endangered fish recovery, and good riparian cover. In addition, otters have been restored to the upper reaches of the San Juan River drainage in Colorado. Most of the proposed restoration segment is remote and runs through Navajo tribal land. Potential conflict with fish species of concern in the San Juan River is currently being assessed (Propst, pers. comm.).

The decision to restore river otters to New Mexico rests with the State Game Commission, except on tribal lands. The New Mexico Department of Game and Fish is

the agency that would plan, implement, and manage a restoration program in the state. Although the responsibility for management of otters ultimately rests in the hands of the Department, the public may also be able to contribute to this program by volunteering to help with surveys and offer other kinds of support for a restoration program.

A successful restoration of river otters to the state will depend not only on the biological factors, but also on a consensus among the people of the state that the return of river otters will benefit all. A program such as this will need a broad consensus from many stakeholders, Native Americans, environmentalists and conservationists, fishermen, trappers, river runners, government agencies, river front landowners, scientists, tourists, and local community folks.

River otters are making a remarkable comeback in many parts of their original range in the U.S. They have proven to be highly adaptable and resilient survivors. The establishment of this lively native animal into the wilder parts of the state can be a measure of our abilities to sustain the health and integrity of our aquatic and wetland communities. With luck, the charismatic and playful river otter could soon be back in New Mexico, and back to stay.

#### **Literature cited**

- Bailey, V. 1931. Mammals of the Southwestern United States. Dover Publication Inc.: NY, NY.
- Bates, B. 1988. Reintroduction of river otter in Utah. Utah Division of Wildlife Resources. Unpublished Report.
- deBuys, W. 1985. Enchantment and Exploitation: The Life and Hard Times of a New Mexico Mountain Range. University of New Mexico Press: Albuquerque, NM.
- Chambers, G. D. 2001. The river otter in Missouri. *The River Otter Journal* 10(2): 1, 3-4.
- Chapman, J.A. and G.A. Feldhamer. 1982. Wild Mammals of North America: Biology, Management and Economics. Johns Hopkins University Press.
- Childs, M. 1999. Literature review and field and laboratory studies of northern crayfish, *Orconectes virilis*, in Arizona. Report to the Heritage Program, Arizona Game and Fish Department.
- Crait, J. 2002. River otters, cutthroat trout, and their future in Yellowstone National Park. *The River Otter Journal* 11(2): 1-3.
- Fernandez, P.J. and P.C. Rosen. 1996. Effects of the introduced crayfish *Orconectes virilis* on native aquatic herptofauna in Arizona. Final report IIPAM No. I94054, Arizona Game and Fish Department.
- Findley, J.S., A.H. Harris, D.E. Wilson, and C. Jones. 1975. Mammals of New Mexico. University of New Mexico Press.
- Fitzgerald, J. P., C. A. Meaney, and D. M. Armstrong. 1994. Mammals of Colorado. Denver Museum of Natural History and University Press of Colorado.
- Haschke, J. and M. Ben-David. 2002. Row..row..row your boat, gently down 'the Green.' *The River Otter Journal* 11 (2): 10-11.

- Herreman, J. and M. Ben-David. 2002. Population Survey for River Otters in Rocky Mountain National Park.. *The River Otter Journal* 11 (1): 10-11.
- Hoffmeister, D.F. 1986. *Mammals of Arizona*. The University of Arizona Press.
- Huey, W.S. 1956. *New Mexico Beaver Management*. New Mexico Department of Game and Fish. Bulletin 4: 1-49.
- MacDonald, S. O. 2002. Oughtabe Otters. *Carapace*: 6 (2): 7.
- Melquist, W.E. and M.G. Hornocker. 1983. Ecology of river otters in west central Idaho. *Wildlife Monographs* 83: 1-60.
- Polechla, P. 2000. Final Report: Ecology of the river otter and other wetland furbearers in the Upper Rio Grande. Bureau of Land Management, Taos, NM.
- Ralls, K. 1990. Reintroduction. Pages 20-21 in *Otters: An action plan for their conservation*. P. Foster Turley, S. Macdonald, and C. Mason, eds. Kelvyn Press: IL.
- Raesley, E.J. 2001. Progress and status of river otter reintroduction projects in the United States. *Wildlife Society Bulletin* 29(3): 856-862.
- Tesky, J.L. 1993. *Lutra canadensis*. In W.C. Fischer, compiler. *The Fire Effects Information System*. Missoula, MT. USDA Forest Service Intermountain Research Station. <http://www.fs.fed.us/database/feis/>