

**Food Habits of the North American River Otter (*Lontra canadensis*)**

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## **Introduction**

The North American river otter (*Lontra canadensis*) is a predator adapted to hunting in water, feeding on aquatic and semi-aquatic animals. The vulnerability and seasonal availability of prey animals primarily determines the food habits and prey preference of the river otter (Erlinge 1968; Melquist and Hornocker 1983). There are many studies that document the food habits of the river otter for most of their present range in North America. Among many, a few areas of study include southeastern Alaska (Larsen 1984); Arkansas (Tumlison and Karnes 1987); northeastern Alberta, Canada (Reid et al. 1994); Colorado (Berg 1999); Idaho (Melquist and Hornocker 1983); Minnesota (Route and Peterson 1988); Oregon (Toweill 1974); and Pennsylvania (Serfass et al. 1990). The diet of the river otter has been determined by analyzing either scat collected in the field (Berg 1999; Larsen 1984; Reid et al. 1994; Serfass et al. 1990; Tumlison and Karnes 1987) or gut contents obtained from trapper-caught otters (Toweill 1974). The contents were identified to family (fish, crustacean, etc.) and species if possible in order to determine the prey selection and the frequency of occurrence in the diet of the river otter.

Fish are the most important prey items for river otters, occurring in the diet throughout the year (Larsen 1984; Reid et al. 1994; Route and Peterson 1988; Serfass et al. 1990, Toweill 1974, Tumlison and Karnes 1987). This has been documented by every study done on river otter food habits. For example, Reid et al. (1994) collected and analyzed 1191 river otter scats in each season in Alberta and found fish present in 91.9% of the scats. Likewise, in Oregon, Toweill (1974) found that fish occurred in 80% of 103 digestive tracts examined. Crustaceans (crayfish), where regionally available, are the second most important prey for otters and may even be consumed more than fish. For example, Grenfell (1974) found that at certain times of the year in a central California marshland, crayfish constituted nearly 100% of the diet. However, river otters are opportunistic foragers and will take advantage of other prey when available (Melquist and Hornocker 1983; Serfass et al. 1990). Other prey consumed by river otters includes reptiles and amphibians, birds, aquatic insects, small mammals and mollusks (Berg 1999, Erlinge 1968; Route and Peterson 1988). River otters avoid consuming carrion (Melquist and Dronkert 1987). The following subcategories are detailed accounts of the otter's food habit in order of documented prey preference:

### **Fishes**

River otters consume a wide variety of fish species ranging in size from 0.8 to 19.5in (2 to 50cm) that provide adequate calorie intake from a small amount of energy expenditure (Melquist and Dronkert 1987). Ryder (1955) stated that river otters feed predominantly on prey in proportion to their abundance but in inverse proportion to their swimming ability. Therefore, slow swimming fishes are preyed upon more often than game fishes when both are equally abundant (Serfass et al. 1990; Toweill and Tabor 1982). Slow-moving fishes include suckers (Catostomidae); sunfishes and bass (Centrarchids); and daces, carp and shiners (Cyprinidae) (Route and Peterson 1988). For

example, Berg (1999) found Catostomidae to dominate the diet in the Upper Colorado River Basin in Colorado. Likewise, in other regions of Colorado, Beck (pers. comm.) found common carp (*Cyprinus carpio*) to be a preferred fish species for the otter.

Some specific examples of fish species that have been found frequently in the otters' diet include: Catostomidae - suckers (*Catostomus* spp) and redhorses (*Moxostoma* spp); Cyprinidae - carp (*Cyprinus* spp), chubs (*Semotilus* spp), daces (*Rhinichthys* spp), shiners (*Notropis* spp and *Richardsonius* spp) and squawfishes (*Ptychocheilus* spp); Ictaluridae - bullheads and catfishes (*Ictalurus* spp). Other fishes that are important in the otters' diet include: fishes that are often abundant and found in large schools such as sunfishes (*Lepomis* spp), darters (*Etheostoma* spp) and perch (*Perca* spp); and bottom dwelling species that are susceptible because of their habit of remaining immobile until a potential predator is close such as mudminnows (*Umbra limi*) and sculpins (*Cottus* spp.) (Melquist and Hornocker 1983; Toweill 1974; Toweill and Tabor 1982).

Game fishes, such as trout (*Salmonidae*) and pike (*Esocidae*), are not an important part of the river otters' diet (Melquist and Dronkert 1987; Toweill and Tabor 1982). Game fishes are fast-swimming and can find good escape cover, making them less available as prey for the otters (Melquist and Dronkert 1987). However, river otters will eat trout (*Salmo* spp), pike (*Esox* spp), walleye (*Stizostedion vitreum*), salmon (*Oncorhynchus* spp), and other game fishes during spawning (Melquist and Hornocker 1983; Reid et al. 1994; Toweill 1974).

Adult river otters can consume 1 – 1.5 kg (2 – 3 lb) of fish per day (Serfass et al. 1990). Erlinge (1968) studied the feeding behavior of captive otters and documented that larger fishes ranging from 6 to 7in (15-17cm) were preferred more than smaller fishes ranging from 3 to 4in (8-10cm) and that otters had difficulty catching fish less than 4in (10cm) or larger than 7in (17cm). Otters take larger fish on land to eat whereas smaller fish are eaten in the water (Serfass et al. 1990).

## **Crustaceans**

Across North America where crustaceans, especially crayfish (*Cambarus* spp, *Pacifasticus* spp, and others), are locally and seasonally abundant, otters may prefer to feed on them more than fish (Route and Peterson 1988). In Georgia, crayfish constituted 2/3 of the prey items in the summer diet and were present in 98% of the summer spraint. In the winter, crayfish constituted 1/3 of the otters' diet (Noordhuis 2002). Tumilson and Karnes (1987) documented a shift in the river otters' diet from fish to crayfish with a shift in water levels in a swamp in Arkansas. During the winter and spring when the water levels were higher, otters preferred to feed on crayfish (73% of scats had crayfish remains) more than fish (Tumilson and Karnes 1987). However, during low water events, crayfish will seek out shelter while fish become more concentrated and highly vulnerable. Therefore, fish are more susceptible to being preyed upon by otters because the easier-to-catch crayfish are more difficult to obtain (Route and Peterson 1988).

## Other

### **Reptiles and Amphibians**

Amphibians, where available regionally, have been identified in the otters' diet during the spring and summer months in many of the food habit studies (Melquist and Dronkert 1987; Reid et al. 1994; Serfass et al. 1990; Toweill and Tabor 1982). The most common amphibians identified were frogs (*Rana* spp and *Hyla* spp) (Toweill 1974). Some specific species eaten by otters include: boreal chorus frogs (*Pseudacris triseriata*), Canadian toads (*Bufo hemiophrys*), wood frogs (*Rana sylvatica*) (Reid et al. 1994), bullfrogs (*Rana catesbeiana*), green frogs (*Rana clamitans*) (Serfass et al. 1990), northwestern salamander (*Ambyostoma gracile*), Pacific giant salamander (*Dicamptodon ensatus*), rough skinned newt (*Tarica granulose*) (Toweill 1974), and garter snakes (*Thamnophis* spp) (Melquist and Hornocker 1983; Toweill 1974). Amphibians and reptiles may be more available for the river otter during the spring and summer due to breeding activity, suitable temperatures, or water availability for the prey (Tumlison and Karnes 1987).

### **Birds**

Waterfowl, some colonial nesting birds, and rails are preyed upon by otters in some areas (Berg 1999, Toweill and Tabor 1982). Frequency of occurrence of these species is greatest during summer (when waterfowl broods are vulnerable) and autumn (Toweill and Tabor 1982). Reid et al. (1994) observed otters catching and consuming moulting American widgeon (*Mareca americana*) and green-winged teal (*Anas crecca*). Other species of birds identified in the otters' diet include: northern pintail (*Anas acuta*), mallard (*Anas platyrhynchos*), canvasback duck (*Aythya valisineria*), ruddy duck (*Oxyura jamaicensis*), and American coot (*Fulica americana*) (Roberts unpub. data; Toweill 1974). Erlinge (1968) found that otters did not feed on bird eggs.

### **Insects**

Aquatic invertebrates have been found to comprise a significant portion of the river otters' diet (Berg 1999, Melquist and Hornocker 1983, Reid et al. 1994, Serfass et al. 1990). Reid et al. (1994) found that otters ate more aquatic invertebrates in the summer as the insect populations increased and certain life stages became vulnerable. Most aquatic invertebrates consumed are from the families Odonata (dragonfly nymphs), Plecoptera (stonefly nymphs) and Coleoptera (adult beetles) (Berg 1999, Reid et al. 1994). Toweill (1974) found one leech (*Hirudinidae*) present in the 103 digestive tracts examined. However, invertebrates found in scats or digestive tracts could most likely be a secondary food item, first being eaten by the fish that are later eaten by otters (Larsen 1984, Toweill 1974).

## **Mammals**

Mammals have been reported infrequently in the otters' diet and are not a major food source (Larsen 1984; Melquist and Dronkert 1987). Mammals that are eaten by the otters include small mammals or riparian species (Berg 1999). The few accounts of mammals identified in the otters' diet include: muskrats (*Ondatra zibethicus*), meadow voles (*Microtus pennsylvanicus*), eastern cottontails (*Sylvilagus floridanus*), and snowshoe hares (*Lepus americanus*) (Field 1970; Reid 1994; Serfass et al. 1990). There are varying accounts of otters preying upon beavers (*Castor canadensis*). Green (1932) reported evidence of otter predation on beavers in the southern boreal forest of Manitoba and it is commonly contended by trappers in Alberta that otters are significant predators of beavers (Reid et al. 1994). Reid et al. (1994) found some beaver remains in 27 out of 1191 scats analyzed. However, many other studies have not found any beaver remains in the scat sampled (Gilbert and Nancekivell 1982; Tumilson and Karnes 1987).

## **Conclusion**

River otters' food habits are determined by prey availability (Ryder 1955). This availability may be determined by the following factors: (1) detectability and mobility of the prey; (2) habitat availability for various prey species; (3) environmental factors such as water depth and temperature; and (4) seasonal changes in prey abundance and distribution in relation to otter foraging habitat (Melquist and Dronkert 1987; Route and Peterson 1988). Otters do not seriously reduce prey populations. When an abundant food source diminishes or other prey become available, otters either move to a new location or shift their diet to the most available prey (Melquist and Hornocker 1983). Although other prey species are important to the river otter temporally, the potential limiting factor to the river otter being established as a permanent resident is the availability of fish year-round (Melquist and Hornocker 1983).

Although prey may be either under- or over-estimated in scat analyses due to the composition of the prey (prey with harder remains (e.g., crayfish) tend to be overestimated while prey with soft body parts are not identified) (Erlinge 1968; Larsen 1984), the studies to date on river otter food habits give an accurate record of the prey that otters are selecting for during seasonal variation. Much of the river otters' diet has been documented in much of their current range in varying habitats. There is data lacking for otters in some regions across North America; however, the food habit of the river otter tends to follow the same general pattern as described above.

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