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Lontra provocax.

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Lontra provocax (Thomas, 1908)

Southern River Otter

Lutra huidobria: Gay, 1847:47 (not *Castor huidobrius* Molina, 1782, a composite).

Lutra provocax Thomas, 1908:391. Type locality "south of lake Nahuel Huapi, province of Rio Negro, Patagonia" [Argentina].

CONTEXT AND CONTENT. Order Carnivora, Family Mustelidae, Subfamily Lutrinae. The genus *Lontra* includes four species: *L. canadensis*, *L. felina*, *L. longicaudis*, and *L. provocax* (Wozencraft, 1993). Davis (1978) considered *provocax* under *canadensis*, based on the morphological and behavioral similarities. However, van Zyll de Jong (1972) recognized *provocax* as distinct from *canadensis* based on a review of the phylogeny of *Lontra* species. The species is monotypic.

DIAGNOSIS. *Lontra provocax* (Fig. 1) is larger (>100 cm in length and >5 kg in body mass) than the marine otter *L. felina* (Larivière, 1998) and is distinguished by the biconcave upper edge of its rhinarium, as opposed to the straight edge of *L. felina* (Foster-Turley et al., 1990). The underparts are silvery whitish, contrasting sharply with the dark undersides of *L. felina* (Redford and Eisenberg, 1992). The skull of *L. provocax* may be differentiated from that of *L. felina* by the larger (>10 cm) condylobasal length (Chehébar and Benoit, 1988).

GENERAL CHARACTERS. Fur of the southern river otter is dark brown dorsally. The venter is much paler, and the neck and throat are gray. All feet are webbed (Parera, 1996). Females have four mammae (Sielfeld, 1983). Measurements (in mm) from four southern river otters (sex unknown) from Argentina and Chile (Redford and Eisenberg, 1992) are, on average (with ranges), as follows: total length, 980 (920–1,010), body length 598 (570–610), tail length, 383 (350–400), hind foot, 120 (108–125). Body mass of adults is 5–10 kg (Chehébar and Benoit, 1988; Parera, 1996). Females are approximately 90% the size of males (Osgood, 1943).

The skull (Fig. 2) is noticeably flattened (Harris, 1968). Skull measurements (mm) of adult southern river otters of unknown sex (Harris, 1968) average (*n*, range) as follows: basal length, 105.8 (3, 102.6–108.7); interorbital breadth, 24.4 (4, 22.2–25.9); width across postorbital process, 31.7 (3, 30.4–33.9); intertemporal breadth, 17.7 (3, 16.6–18.8); mastoid breadth, 75.7 (3, 74.0–77.8); zygomatic breadth, 79.3 (3, 78.0–81.5).

DISTRIBUTION. *Lontra provocax* probably occupies the smallest geographical area of all otters (Chehébar, 1986). The species is present in the Argentine and Chilean Patagonian region, between latitudes 36°S and 52°S (Chehébar et al., 1986). In Chile, the southern river otter is found from Mahuidanche river (39°S) in the province of Colchagua to the Strait of Magallanes (Fig. 3). Disjunct populations occur in the rivers Cayutué, Cole Cole, Enco, Futaleufú, Quinque, Lingue, Llico, Mahuidanche, Negro, Petrohué, Puelo, Pullafquén, Yelcho, and lakes Chaiguata, Cucao, Neltume, Panguipulli, Riñihue, and Todos Los Santos (Medina, 1991, 1996*b*). Historically, glacial ice may have prevented *L. provocax* from occupying many freshwater bodies of Chile (Redford and Eisenberg, 1992). Currently, the distribution of *L. provocax* is limited by habitat degradation and human disturbance (Medina, 1996*b*).

In Argentina, the southern river otter is present along the Andes from the southern part of the province of Neuquén down to Tierra del Fuego (Cabrera, 1957; Redford and Eisenberg, 1992). However, only three main populations remain: Nahuel Huapi National Park, the coast of Beagle Canal in the Tierra del Fuego National Park, and on Staten Island (Chehébar, 1985; Porro and Chehébar, 1995). *L. provocax* is rare in Lanin, Puelo, and Los Alerces National Parks (Chehébar et al., 1986).

FOSSIL RECORD. The genus *Lontra* is present in remains from the Lujanian (late Pleistocene), although no fossils of *L. provocax* are known (Savage and Russell, 1983). *Lontra provocax* probably evolved from other large Neotropical species after invasion of the Patagonian subregion (van Zyll de Jong, 1972).

FORM AND FUNCTION. Dental formula is i 3/3, c 1/1, p 4/3, m 1/2, total 36 (Parera, 1996). *Lontra provocax* displays a tendency towards broadening of the dentition, suggesting a dental specialization for crushing (van Zyll de Jong, 1972).

REPRODUCTION. In central Chile, mating occurs in July and August, and young are born in September and October (Housse, 1953). In southern areas, young can be observed all year (Parera, 1996). Litter size averages one or two, but may reach up to four (Sielfeld, 1983). Whether *L. provocax* exhibits delayed implantation is unknown (Chehébar and Benoit, 1988).

ECOLOGY. *Lontra provocax* is predominantly a freshwater species which secondarily occupied the marine litoral of southern Chile (Sielfeld, 1983). The species is found mostly in freshwater lakes and tributaries, but also occurs in marine habitats. In the Patagonian archipelago, it occurs on rocky coasts and canals protected from waves, where coastal strips of vegetation such as *Drimis winteri*, *Notofagus betuloides*, and *Maytenus magellanica* are present, possibly for the establishment of dens and because of reduced human disturbance (Chehébar et al., 1986; Medina 1996*a*, 1996*b*; Sielfeld, 1983).

In Argentina, *L. provocax* is associated with dense mature forest with thick undergrowth extending close to shore. Root systems of mature or fallen trees are important components of the habitat of *L. provocax*. Lack of cover may result in absence of otters, even if abundance of prey is not limiting (Chehébar et al., 1986). In Nahuel Huapi National Park, the presence of southern river otters is not influenced by human settlements, presence of domestic dogs, or frequency of human visitors (Chehébar, 1985, 1990; Chehébar et al., 1986).

The southern river otter consumes mostly fish *(Cheridon australe, Cyprinus carpio, Galaxias, Notothenia, Oncorhynchus mykiss, Percichthys trucha, Percillia gillissi, Salmo trutta)* and crustaceans *(Aegla, Camilonotus, Lithodes antartica, Munida, Paralomis granulosa, Parastacus pugnax,* and *Sammastacus spinifrons)*. Molluscs *(Diplodon chilensis, Fissurela)*, and birds may

FIG. 1. Adult *Lontra provocax* in captivity. Photograph provided by C. Chehébar.

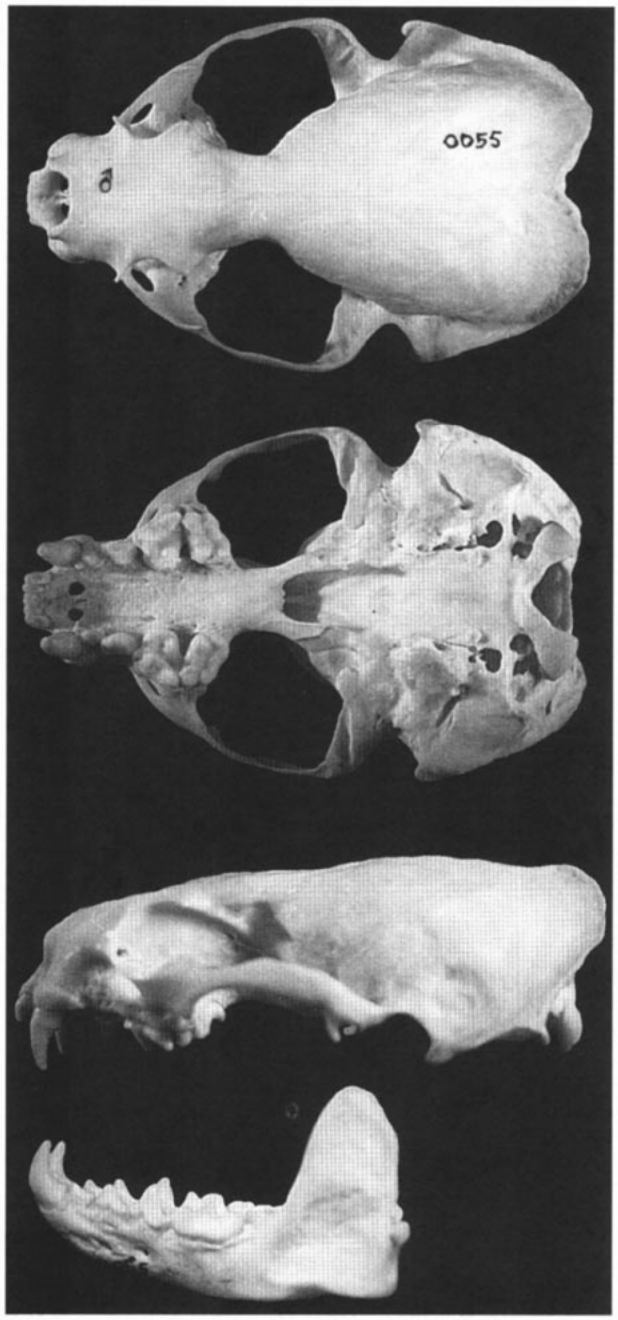

FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of *Lontra provocax*. Greatest length of skull is 111.5 mm.

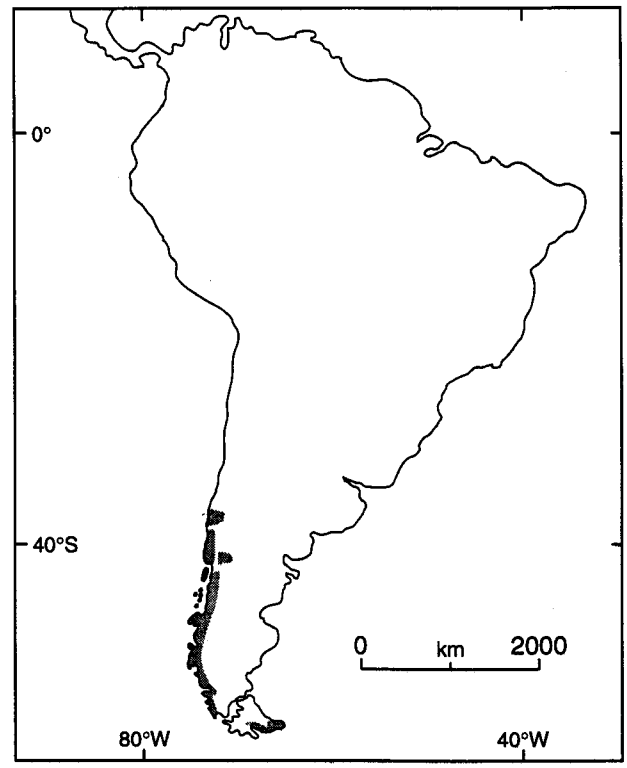

FIG. 3. Distribution of *Lontra provocax* in South America, modified from Garcia-Mata (1978), Medina (1996*b*), Redford and Eisenberg (1992), and Sielfeld (1992).

also be consumed (Chehébar, 1982; Chehébar and Benoit, 1988; Medina, 1996*a*, 1996*b*, 1997; Sielfeld, 1983).

The relative importance of each food type may vary seasonally or geographically (Medina, 1996*a*). In central Chile, the diet of the southern river otter is composed of fish <100 mm in length (75% occurrence) and crustaceans (63% occurrence—Medina, 1996*a*), and the highest occurrence of fish occurs in spring and summer (Medina, 1996*a*). In the southern marine habitats of Chile, *L. provocax* feeds mainly on fish (Sielfeld, 1983). In Argentina, crustaceans largely dominate the diet (99% occurence in >8,000 scats), whereas fish occur rarely (<2%—Chehébar, 1985; Chehébar and Benoit, 1988). Differences in the proportion of fish and crustaceans in the diet reflect differential availability of prey types in different habitats: fish productivity is low in freshwater lakes compared to the ocean, and may explain the high proportion of crustaceans in freshwater lakes (Chehébar et al., 1986; Medina, 1996*a*). Furthermore, introduction of salmonids that may outcompete native fish may have affected the diet of *L. provocax* by being too fast for the otter to catch consistently (Chehébar, 1985; Chehébar and Benoit, 1988; Medina, 1996*a*). Low densities of crustaceans may explain the absence of *L. provocax* from the Manso River basin in Argentina (Chehébar, 1985).

Males may move 5 km in one day (Parera, 1996), and one 9.6 kg male moved 30 km in a few months following its relocation (Parera, 1996). Southern river otters do not defend territories, and home ranges overlap with those of neighbouring individuals (Parera, 1996). Density of southern river otters averages 0.73 individuals (range 0.71–0.75) per km of coastline in southern Chile (Sielfeld, 1992).

Lontra felina and *L. provocax* have sympatric distributions, but they are not found in the same habitats. Both species show high overlap (85% of food items shared) in their diet (90% for fish species and 80% for molluscs), and in their preference of rocky shores (99% similarity—Sielfeld, 1989). However, marine otters occur in exposed, wave-beaten shores whereas southern river otters occupy calm bays and inlets (Chehébar, 1990; Sielfeld, 1990). Spatial segregation of both species may reduce interspecific competition (Ebensperger and Botto-Mahan, 1997; Sielfeld, 1989). As suggested by their narrower diet, southern river otters likely adapted to marine environments later than did *L. felina* (Ebensperber and Botto-Mahan, 1997).

Although the southern river otter appears less abundant where American mink (*Mustela vison*) has been introduced, competitive interference is unlikely (Chehébar, 1985; Chehébar et al., 1986). Low overlap in diet (<26%) and habitats used (5–22%) between the two species suggest that the southern river otter and the American mink may coexist with little competition for food or space (Chehébar and Benoit, 1988; Chehébar et al., 1986; Medina, 1997).

No evidence of predation on southern river otters has been reported, but cougars (*Puma concolor*) may catch individuals on land, whereas sharks and killer whales (*Orcinus orca*) are potential predators of individuals at sea (Parera, 1996). No diseases or parasites have been reported for this species.

BEHAVIOR. Southern river otters are mostly solitary (Parera, 1996), and primarily nocturnal (Housse, 1953; Parera, 1996), although activity may occur during the day (Sielfeld, 1983). During

the day, southern river otters use a series of dens located around their home range. *L. provocax* may use rock cavities, hollow trees or logs, earth banks, or tree roots (Chehébar and Benoit, 1988; Housse, 1953), or may excavate a den on land (Chehébar, 1982). Dens occur from 0.7 to 50 m from the shoreline (Medina, 1996*a*), most within 3–8 m of the water's edge (Chehébar, 1982). Dens often have multiple terrestrial, but no underwater, entrances (Medina, 1996*a*). Density of dens along the coast of southern Chile was 2.8 dens/km of coastline (Sielfeld, 1992). Parturition occurs in the same dens used for daily resting (Chehébar and Benoit, 1988; Sielfeld, 1983).

Presence of southern river otters can be confirmed by tracks (typically 6.0 cm in length and 6.3 cm in width), feces (3.5 cm in diameter, and 11 cm in length), or prey remains (Chehébar, 1982), especially bivalves that are eaten by crushing the smaller end, a behavior typical of *L. provocax* (Chehébar, 1982). Southern river otters use regular feeding stations where a considerable build-up of prey remains may occur (Chehébar, 1982). Latrines are common near den entrances (Chehébar, 1982), or inside dens (Chehébar and Benoit, 1988). Latrines are 50–80 m from one another, and 3–6 m from water (Chehébar, 1982).

GENETICS. *Lontra provocax* has 2n = 38 chromosomes (van Zyll de Jong, 1987).

CONSERVATION STATUS. In much of its Chilean range, *L. provocax* has been exterminated by a combination of habitat destruction, disturbance, and excessive hunting (Chehébar et al., 1986; Housse, 1953; Medina, 1996*a*, 1996*b*; Porro and Chehébar, 1995). In the early 1900s, fur of the southern river otter was highly priced, and excessive hunting resulted in a decrease of its range. North of 36°S, the decline of the southern river otter began after 1880, and proceeded from north to south, and from the center of its range to the east and west. The decline south of 43°S began around 1917, and went from east to west. Southern river otters were extirpated north of 38°S before 1960. Between 39°S and 43°S, the decline has been patchy (Medina, 1996*a*, 1996*b*). Large basins with extensive networks of interconnecting aquatic habitats may be recolonized more rapidly than isolated water bodies; this may explain the absence or rarity of the southern river otter from small water basins in Lanin, Puelo, and Los Alerces National Parks in Argentina (Chehébar et al., 1986; Porro and Chehébar, 1995, 1996).

Nowadays, the pelt of a southern river otter may be worth 2–3 months' wage for an unskilled Chilean worker, and the potential for poachers to be caught and fined is low (Miller et al., 1983). Thus, illegal hunting is still prevalent in Chile, especially south of the Chiloé region (44°S—Medina, 1996*a*). Currently, populations of southern river otter are threatened by power dams, water pollution, vegetation removal, illegal hunting, and drainage for agriculture (Chehébar, 1990; Medina, 1996*a*). Southern river otters are harvested illegally with shellfish-baited hooks, puyero nets, lances, shotguns, foothold traps, and dogs (Medina, 1996*b*).

Conservation of the southern river otter in the future must rely on three approaches: education, recovery, and re-establishment (Medina, 1996*a*, 1996*b*). Reintroduction of southern river otters may be successful in areas where they were exterminated due to excessive hunting (Porro and Chehébar, 1995; Medina, 1996*a*). Control of poaching, restriction of use of water areas for boating and fishing, maintenance of abundant mature plant cover on the shorelines, and periodic monitoring of populations should also be encouraged as conservation measures (Chehébar, 1985; Porro and Chehébar, 1995, 1996). At present, survival of the southern river otter in Argentina depends largely on continued existence of viable populations in Nahuel Huapi National Park and on Staten island (Chehébar et al., 1986).

The southern river otter is classified as threatened by the Consejo Asesor Regional Patagónico de la Fauna Silvestre and Libro Rojo de los Vertebrados Terrestres de Chile (Porro and Chehébar, 1995). *L. provocax* is considered vulnerable by the International Union for the Conservation of Nature, is considered endangered by the United States Department of Interior, and is listed in Appendix I of the Convention for the International Trade of Endangered Species (Nowak, 1991; Parera, 1996).

REMARKS. Studies on the ecological and conservation requirements for this species are needed (Mason and Macdonald, 1990; Medina, 1996*b*). Field surveys of remaining populations, and periodic monitoring are also recommended for evaluation of the present distribution and status of the southern river otter (Chehébar, 1990; Mason and Macdonald, 1990).

The taxonomy of the genus has been debated, but recent treatments support the use of the name *Lontra* rather than *Lutra* for New World river otters (Larivière and Walton, 1998; Wozencraft, 1993). Vernacular names in addition to southern river otter include river wolf (Medina, 1991), large river otter, and *loutre sud-américaine* (French). Spanish names include *lobito (de rio) Patagónico, gato de aqua, huilltín,* and *nutria de río* (Medina, 1996*a*; Osgood, 1943; Parera, 1996; Redford and Eisenberg, 1992).

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