

STATUS OF BEAVERS (*CASTOR CANADENSIS FRONDATOR*) IN RÍO BAVISPE,
SONORA, MÉXICO

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There are few published records of beavers (*Castor canadensis*) from the northeastern watershed of the Sierra Madre Occidental of Mexico. Baird (1859) found beavers in Cañón de Guadalupe (at 5,000 ft, affluent of Río Bavispe), Mearns (1907) reported them at Cajón Creek (tributary of Río Bavispe), and Caire (1978) observed beaver activity north of Tasaviri (near San Miguelito) on Río Bavispe. The presence of beaver on Río Bavispe was not mentioned by Villa (1954), Leopold (1959), Anderson (1972), or Cortés-Calva (1999). Recent records of beavers from the State of Sonora include 20 records from the lower Río Colorado in Valle de Mexicali (Mellink and Luévano, 1998). Historical records of *C. c. frondator* include Río San Pedro and Río Sonora (Mearns, 1897; Burt, 1938) and 45 km NNE from Cananea (Villa, 1954). Surveys for fish, birds, and mammals have been conducted in several parts of the Río Bavispe but no sign of beavers has been reported (Hendrickson et al., 1981; Campoy-Favela et al., 1989; Rodríguez-Estrella, 1990; Gallo, 1996).

Even though beavers are protected by law (SEMARNAP, 1994), their current status in the

northeastern areas of Sonora, particularly in the drainage of Río Bavispe, is unknown, although Caire (1997) supposed that they were still present. The purpose of our survey was to determine the status of beavers in this area.

The first survey for beaver presence or sign was conducted from 25 to 29 October 1999. The survey method involved walking 1-km along stretches of the Río Bavispe northward from Cóbora to La Morita (Fig. 1). We surveyed only those stretches that were easy to access, but stretches of river bounded by towns were not surveyed. A total of 17.3 km was surveyed with each 1-km stretch separated by an average of 6.4 km (a total of 68 km of river covered). Small creeks leading into the river and secluded pools were searched by walking the riverbanks, looking for tracks, gnawed trunks or branches, felled trees, stumps, branches in the water, dens, dikes, foraging sites, and other indirect evidence of past or current beaver activity. Upon finding any evidence of beaver activity the coordinates were taken with a Magellan GPS. The temperature of the water was measured with a bucket thermometer.

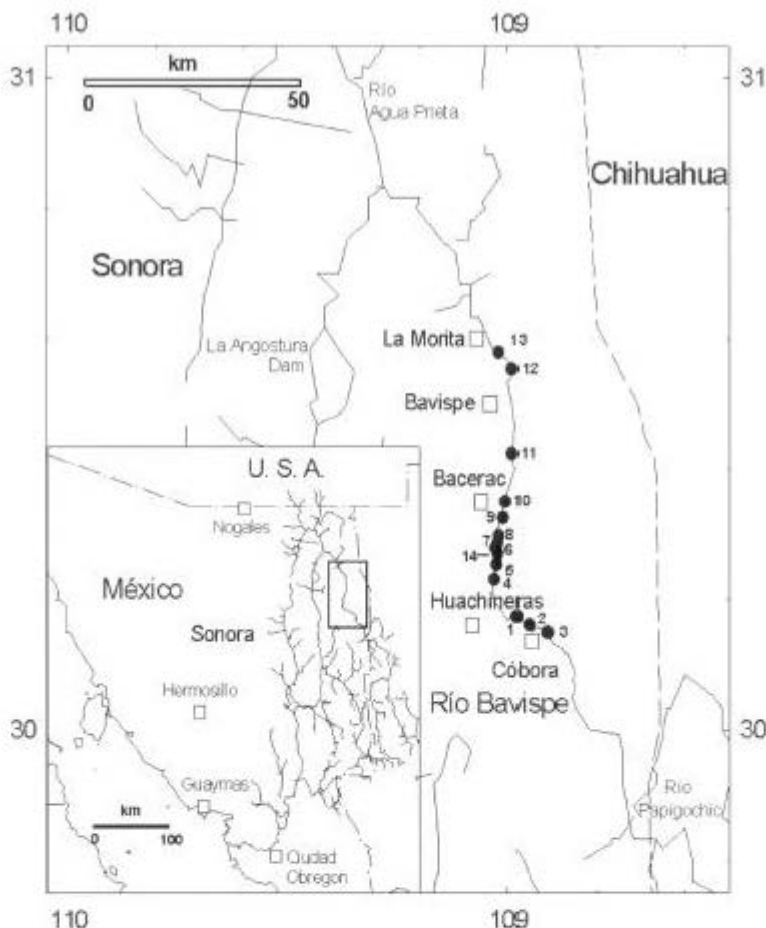


FIG. 1.—Records of beaver (*Castor canadensis frontator*) from a survey (solid circles correspond to observations in Appendix 1) on the Río Bavispe Basin in the State of Sonora, northern Mexico. The small box indicates the area surveyed from 26 to 29 October 1999.

Interviews with ranchers and fishermen were conducted to determine if local inhabitants were aware of beaver along the river. This also provided information about whether or not beaver were hunted locally for their fur. Visits to local tanneries produced no additional information about other distributional records or specimens (skulls, skeletons, and furs).

To characterize the diet and the preferential foraging of beavers, plant specimens in foraging sites were collected and analyzed to determine which plants were eaten by beavers. The habitats where beaver signs were noted were described according to riparian vegetation, geologic features, and hydrologic characteristics.

The Río Bavispe-Yaqui basin is important in northwestern Mexico and contains 70% of the river water in the State of Sonora. It is found between 27° and 31°N, and from 108° to 111°W, and occupies around 30% of the state (Fig. 1). The southern headwaters originate in the western watershed of the Sierra Madre Occidental in the southwestern portion of the State of Chihuahua, the northern headwaters originate in the southeastern corner of Arizona. The basin has an area of approximately 75,000 km² with a total length of 740 km. Three large dams control its flow: La Angostura Reservoir in the northern portion over the Río Bavispe, El Novillo Reservoir in the mid-Yaqui, and Oviachic Reservoir to the

south, near Ciudad Obregón (Hendrickson et al., 1981; Bojórquez et al., 1985). The river gradient averages 5.9 m/km, from Rancho Cóbora (1,300 m) to north of Rancho La Morita (1,000 m), a drop of 300 m over a large valley formed by river deposits of silt.

Although no actual observations of beavers were obtained, 14 new sites (Fig. 1, Appendix 1) with indirect evidence (consisting of footprints, felled trees, gnawed branches, dens, and dikes) of beaver presence were found in a 68-km stretch of river. Signs of beaver activity were associated with the presence of cottonwoods (*Populus fremontii*) and willows (*Salix exigua*) on the riverbanks and on inundation flats.

At 8 feeding sites beavers preferred small branches with leaves (30 cm long by 3 to 4 cm thick) of Fremont cottonwood (60%) and willow (40%). The abundance of cottonwood and willow in the area provides a stable environment for beaver along the northeastern portion of Río Bavispe. The preferred sites selected for den building seemed to be in fallen tree trunks where beavers accumulated branches and trunks of other trees to make a den. Dikes were built in areas of dense vegetation along small creeks or in excavated channels used for farm or ranch irrigation. In some areas of the Río Bavispe beavers were considered by ranchers as a nuisance because their dikes blocked irrigation channels built by ranchers to direct water from the river. These dikes were built using felled tree trunks deposited by the floods of winter rains and snow, and by adding branches of willow, cottonwood, and other trees on the channels. Evidence of beaver presence were found in areas where the river surface water temperature ranged from 15 to 29°C, averaging 18.8°C, with a modal temperature of 16°C.

The population of beavers in Río Bavispe is healthy in several isolated non-perturbed areas where there is not extensive fishing or water extraction for farming and cattle ranching is the main human activity. Beavers were more abundant in areas where the riparian vegetation was intact and undisturbed. Beavers were less abundant in areas perturbed by farming and urban growth, where the natural riparian vegetation had been removed. Illegal hunting of beavers still seems to exist, but because the pelt of this species has no value in the area,

they are not extensively hunted. Interviews with local inhabitants revealed that they knew that beavers were protected by law. In general, the status of beavers in this area seems stable with more abundant populations existing in areas of difficult access where few human activities take place.

Resumen—Se recorrió el área del Río Bavispe en el noreste de Sonora, México, en octubre de 1999. Se encontraron castores en 14 sitios. También se encontró una clara asociación de la presencia de castor con la del álamo, *Populus fremontii*, y del sauce, *Salix exigua*. La población se encuentra aparentemente estable debido a lo remoto del área, la cual es usada para ganadería y extracción de agua para irrigación. No hay fuente de contaminación debida a la industria, la minería o a la presencia de grandes ciudades en esta porción del Río Bavispe. Esta región del Río Bavispe debe ser preservada para esta y otras especies de flora y fauna.

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APPENDIX 1

Observations of beaver sign along Río Bavispe, Sonora, México. Site numbers correspond to mapped localities in Fig. 1.

Huachineras, Rancho Cóbora (30°12'32"N 108°54'06"W)—Site 1) tracks and *S. exigua* trunk gnawed, site 2) branches of *P. fremontii* piled and cut, site 3) *S. exigua* branches eaten.

Huachineras, Puente Babidanchic (30°16'55"N 108°56'05"W)—Site 4) *S. exigua* branches cut and eaten.

Bacerac, Bajío del oso (30°16'58"N 108°57"W)—Site 5) *S. exigua* cut (between *Baccharis glutinosa*).

Bacerac, Tamichopa (30°15'47"N 108°53'54"W)—Site 6) *S. exigua* old and new gnawing of branches and trunks, site 7) *S. exigua*, *P. fremontii*, branches piled and cut, tracks, den, site 8) branches cut and eaten under a *P. fremontii*, site 9) den on the roots of *P. fremontii*, branches of *P. fremontii* eaten, site 10) den between *B. glutinosa* and *Prosopis glandulosa*.

Bavispe, La Galera (30°25'38"N 108°55'09"W)—Site 11) *P. fremontii* cut and eaten, site 12) tracks, *P. fremontii* cut and eaten.

Bacerac, Las Peñas (30°17'20"N 108°57'02"W)—Site 13) *S. exigua* cut and eaten.

Bacerac, Las Higuieritas (30°17'24"N 108°56'56"W)—Site 14) den on *P. fremontii*, eaten branches of *S. exigua*.