

A Guide to the
MAMMALS
of CHINA

*Andrew T. Smith
and Yan Xie, Editors*

Federico Gemma, Illustrator

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themselves out against the bark to heighten the effect. They use holes in trees for shelter, and they often move through the trees by making long leaps. The diet consists of insects and some fruit and vegetable matter, including mistletoe. Vocalization is a harsh "chick." They are sometimes sympatric with *Dremomys lokriah*.

Conservation Status: China RL—LC.

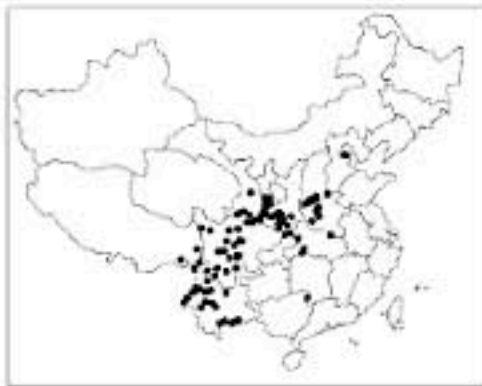
References: Moore and Tate (1965).

Swinhoe's Striped Squirrel

Tamias swinhoi (Milne-Edwards, 1874)
隐纹松鼠 Yinwen Songshu

PLATE 10

MAP 55



MAP 55. SWINHOE'S STRIPED SQUIRREL, *Tamias swinhoi*

Distinctive Characteristics: HB 140–164; T 67–116; HF 28–35; E 9–16; GLS 31–41; Wt 67–90 g. Dorsal pelage long and soft, olive-brown or olive-gray in color; five dark stripes, the central one black; lateral stripes brown or same color as body hairs; four light dorsal stripes, olive-yellow, olive-gray, even buffy; ventral pelage whitish. Pale stripe under the eye not continuous with the barely discernible lateral light stripe on the dorsum. Although there is considerable overlap, *swinhoi* is usually larger than other species of *Tamias*.

Distribution: C China; extending to N Myanmar and N Vietnam. Eight subspecies in China: (1) *T. s. chingpingensis* Lu and Qian, 1965; W Yunnan; (2) *T. s. clarkei* Thomas, 1920; Yunnan (upper Yangtze River valley); (3) *T. s. forresti* Thomas, 1920; Yunnan (Lichang range); (4) *T. s. olivaceus* Osgood, 1932; S Yunnan; (5) *T. s. russeolus* Jacobi, 1923; Sichuan, Yunnan (between upper Yangtze and Mekong rivers); (6) *T. s. spencei* Thomas, 1921; NW Yunnan, SE Xizang; (7) *T. s. swinhoi* (Milne-Edwards, 1874); Sichuan, N Yunnan; (8) *T. s. vestitus* Miller, 1915; Beijing, Hebei, Henan, Shaanxi, Shanxi, Gansu, Ningxia, Hubei, NE Sichuan.

Natural History: The range of this species does not overlap the range of *T. maclellandii* to any significant extent. However, at points where the two ranges meet, there are significant differences in elevation between the two, *maclellandii* occupying tropical habitat between 300 and 600 m, while *swinhoi* is most common in evergreen broadleaf trees or conifers at elevations between 2,500 and 3,000 m. This squirrel is almost exclusively arboreal, living in holes in trees, although they can be found on the ground. It is known to take long jumps between trees. The call uttered by Swinhoe's Striped Squirrel is high pitched, like that of a bird. They are primarily active at dawn and dusk. Diet consists of young shoots, fruits, and insects.

Comments: Has included *maritimus* in many treatments.

Conservation Status: China RL—LC.

References: Moore and Tate (1965).

Subfamily Xerinae—Afro-Asian Ground Squirrels

非洲地松鼠亚科 Feizhoudisongshu Yake—
非洲地松鼠 Feizhoudisongshu

The subfamily Xerinae consists of 15 genera and 128 species, divided into three tribes: Xerini, Protoxerini, and Marmotini. The Xerini are confined to Africa, with the exception of *Spermophilopsis*, which extends into Central Asia (but not as far as China), while all representatives of the Protoxerini are found in Africa. All Chinese Xerinae are placed in the tribe Marmotini; 4 genera and 13 species are represented in China.

Genus *Marmota*—Marmots

旱獭属 Hanta shu—旱獭 Hanta

Size large, habits terrestrial; body stout; tail short, tip flat; ears short and round; limbs stout; forefeet, four toes, pollex reduced, middle digit on forefeet longest, fore limbs with robust claws modified for burrowing; hind feet, five toes; female five pairs of teats; skull robust, nearly triangle-shaped; skull low and flat, skull height subequal to the distance between anterior margin of premaxilla and premolars; orbits long, postorbital process robust, slightly curved externally downward; sagittal crest well developed, anterior portion branches off to link with postorbital

Key to the Chinese Genera of Xerinae

- | | |
|-------------------------------------|---------------------|
| 1.a. Size large, HB > 350 mm | <i>Marmota</i> |
| b. Size smaller, HB < 300 mm | 2 |
| 2.a. Size very small, HB < 165 | <i>Tamias</i> |
| b. Size larger, HB > 165 | 3 |
| 3.a. Hairs on tail short, not bushy | <i>Spermophilus</i> |
| b. Hairs on tail long, bushy | <i>Sciurotamias</i> |

Key to the Chinese Species of *Marmota*

- | | | |
|--|---------------------------|---|
| 1.a. Tail long, with terminal hairs averages half of HB length | <i>Marmota caudata</i> | |
| b. Tail short, with terminal hairs averages < half of HB length | | 2 |
| 2.a. Dorsum light brown or light rusty, not mixed with black | <i>Marmota sibirica</i> | |
| b. Dorsum not brown, mixed with black and light brown | | 3 |
| 3.a. Ventral pelage buffy or light brown, rostrum blackish brown; ears usually russet | <i>Marmota himalayana</i> | |
| b. Ventral pelage drab or dark russet; rostrum dark brown; ears generally sandy yellow | <i>Marmota baibacina</i> | |

process; occipital ridge conspicuously elevated; mastoid process on occipital well developed; palate longer than half of GLS; incisors robust, anterior surface yellowish; first upper premolar large, crown about half of second premolar; third molar largest; lower molars with two lateral cusps. Dental formula: 1.0.2.3/1.0.1.3 = 22. Baculum similar to *Spermophilus*, form nearly S-shaped, tip edged by irregular denticles. The molecular phylogeny of the marmots has been reviewed by Steppan et al. (1999). Diurnally active; all forms hibernate. Occurs in Asia, Europe, and North America. Of 14 species, 4 occur in China.

Gray Marmot

Marmota baibacina Kastschenko, 1899 MAP 56
灰旱獭 Hui Hanta



MAP 56. GRAY MARMOT, *Marmota baibacina*

Distinctive Characteristics: HB 460–650; T 130–154; HF 74–99; E 22–30; GLS 83–100; Wt 4,250–6,500 g. Size similar to *Marmota caudata*, tail short, less than 1/3 of HB length; dorsum buffy or sandy yellow, sprinkled with black or dark blackish brown; ventral pelage dusty or dark russet; ears sandy yellow; rostrum dark brown; skull broader and sagittal crest more robust than in *caudata*; rear margin of foramen magnum round; second upper premolar slightly larger than the former molar. 2N = 38.

Distribution: Xinjiang; extending into Mongolia, Russia, Kyrgyzstan, and Kazakhstan. Chinese subspecies: *M. b. centralis* (Thomas, 1909).

Natural History: Preferred habitats include montane steppe spreading over low mountains with gentle slopes. Fewer live in stony mountain steppes strewn with boulders, or the alpine zone. Where the Gray Marmot lives in sympatry with the Siberian Marmot, the Gray Marmot occupies only tips of ridges characterized by alpine vegetation while the Siberian

Marmot inhabits productive highland valleys. This species, like most marmots, is highly social and lives in colonies with many burrows. Summer and winter burrows are usually separate; winter burrows are deeper, while summer burrows are just as long, but not as deep; both types may hold 2–3 marmots, but in winter, up to 10. Marmots eat a wide variety of food plants, which vary with season. Early spring foods include *Artemisia frigida*; by late spring and early summer their diet consists mainly of grasses; and by late summer, herbaceous vegetation. Mating begins in early May and ends by the beginning of June. Gestation lasts 40 days. Hibernation is initiated at different times in different places, from August to October, and appears influenced by local weather and food resources. Enemies include large raptors, wolves, and other smaller predators such as foxes, steppe polecats, and Pallas' cats.

Comments: Formerly included in *M. bobac*, but these forms are considered sister species.

Conservation Status: China RL–LC.

References: Rogovin (1992).

Long-Tailed Marmot

Marmota caudata
(Geoffroy Saint-Hilaire, 1844)
长尾旱獭 Changwei Hanta

PLATE 9

MAP 57



MAP 57. LONG-TAILED MARMOT, *Marmota caudata*

Distinctive Characteristics: HB 426–570; T 185–275; HF 63–92; E 18–30; GLS 87–105; Wt 4,100–4,600 g. Form stout; tail longest within *Marmota*, with terminal hairs up to half of HB length and black at the tip. Whole body orange or pale brown; ventral pelage essentially colored the same as the dorsum, with no evident boundary. Postorbital process strongly curved out and down; dorsal rim of foramen magnum semi-circular; crown of second upper premolar subequal to that of the previous two molars.

Distribution: Xinjiang (Tian Shan mountains); extending throughout Central Asia, Afghanistan, Pakistan, and N India. Chinese subspecies: *M. c. aurea* (Blanford, 1875).

Natural History: The Long-tailed Marmot is a montane animal; it inhabits the zone of coniferous forests but also penetrates the alpine zone, chiefly on open stony stretches, although it does not avoid forests. This species is less common in feather-grass and fescue areas, and it is uncommon in semidesert tracts with shrub cover (winter-fat, sagebrush); it shuns saline soils. The animal prefers dry, clifflike mountain slopes covered mainly by short grasses, or at lower elevations, stands of junipers up to 3–4 m high. Like other marmots, it is strictly diurnal. Emerges from burrow shortly after sunrise, when the ground surface has begun to warm. If disturbed by an intruder, it utters a call that resembles a bird call, which is unique to this species. Diet consists of the leaves and stems of various grasses, and legumes, which it prefers. Frequently found in monogamous situations consisting of one adult male and one adult female, although social groups of up to seven adults may be formed. When multiple females share a common home range, only a single adult female lactates and weans young. Litters of two to five are seen outside burrows by late April or early May. Shortly after the young emerge, adults begin to molt, ending by mid- or late August. Two weeks after the end of molt, they enter their burrow to begin hibernation, about mid-September.

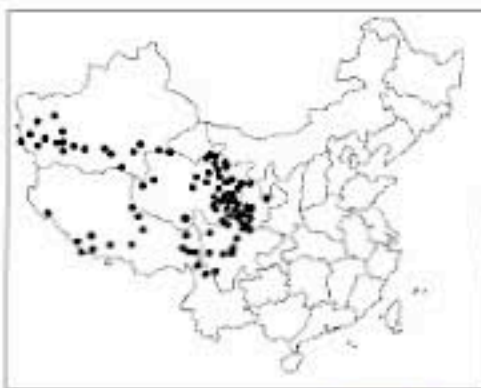
Conservation Status: China RL–LC. CITES–III (India). IUCN RL–LR/nt ver 2.3 (1994).

References: Blumstein and Arnold (1998).

Himalayan Marmot

Marmota himalayana (Hodgson, 1841)
喜马拉雅旱獭 Ximalaya Hanta

PLATE 9
MAP 58



MAP 58. HIMALAYAN MARMOT, *Marmota himalayana*

Distinctive Characteristics: HB 475–670; T 125–150; HF 76–100; E 23–30; GLS 96–114; Wt 4,000–9,215 g. Form stout; tail very short—less than twice HF length. Dorsum grass-yellow or buffy, sprinkled with many irregular black spots; ventral pelage buffy or light brown; ears dark yellow or russet; rostrum often with black or blackish brown spots. Skull large; dorsal rim of foramen magnum semioval; structure of teeth shows no evident difference from *Marmota baibacina*. **Distribution:** C to W China; extending to Nepal, India. Two subspecies in China: (1) *M. h. himalayana*

(Hodgson, 1841); S Xizang; (2) *M. h. robusta* (Milne-Edwards, 1871); Qinghai, Xizang, W Sichuan, Yunnan, Gansu, Xinjiang.

Natural History: Inhabits upland grassland from 3,750 to 5,200 m (up to 5,670 m). This species is adapted to alpine meadows and desert conditions with very low rainfall, typically inhabiting steep bush-dotted slopes. Himalayan Marmots live in small or large colonies, depending on local resources, and feed on grasses by preference, although they also consume roots, leaves of herbaceous plants, and seeds. They excavate unusually deep burrows, which are shared by colony members during hibernation. Females give birth toward the end of hibernation, with litter size reported to be 2–11 (average = 7 at low density; 4.8 at high density), born from April to July. Gestation is one month, and young are generally weaned at 15 days of age. Young normally remain with their family, and females become reproductively active only in their second spring.

Comments: In the early literature, *M. sibirica*, *M. himalayana*, and *M. baibacina* have all been considered subspecies of *Marmota bobak* (see Thorington and Hoffmann 2005).

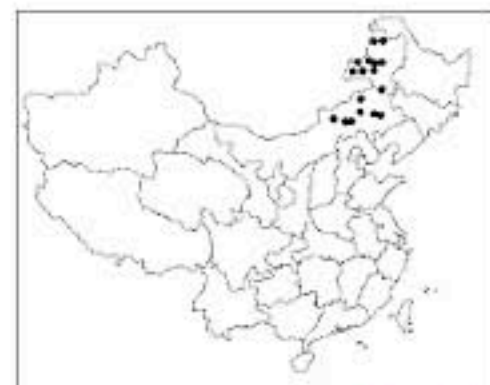
Conservation Status: China RL–LC. CITES–III (India).

References: Huang et al. (1986).

Tarbagan Marmot

Marmota sibirica (Radde, 1862)
草原旱獭 Caoyuan Hanta

MAP 59



MAP 59. TARBAGAN MARMOT, *Marmota sibirica*

Distinctive Characteristics: HB 360–495; T 112–121; HF 72–82; GLS 80–104; Wt 5,000 g. Size slightly smaller than other species; dorsum light brown or light rusty, sprinkled with light whitish yellow; ventral pelage brown; rostrum and top of forehead dark brown; ears light orange; tail dark brown without black hue. Frontal flat behind, not concave; postorbital process robust, lateral side of anterior zygomatic arch clearly lozenge-shaped; rear margin of foramen magnum round; crown of second upper premolar equal to that of first molar, but less than that of the last two molars. $2n = 38$.

Distribution: Nei Mongol, Heilongjiang; extending across Mongolia and Russia (Siberia, Tuva, Transbaikalia). Only one subspecies is generally accepted; *M. sibirica caliginosus* Bannikov and Skalon, 1949.

Natural History: The Tarbagan Marmot resembles the Bobac Marmot of E Europe and C Asia in mode

of life and habits. Both species are highly colonial, and their primary habitat is steppe grasslands. Marmots of all ages forage on grasses, but also on 10–15 species of herbs and a few woody plants such as sagebrush. Autumn hibernation is initiated in September but is influenced by summer food conditions and fall weather. Both Bobac and Tarbagan marmots hibernate in groups of 5–20 in a single burrow. Enemies include wolves, red foxes, and several species of large eagles and hawks. The Tarbagan Marmot may carry and transmit bubonic plague and is therefore subject to stringent control measures in many parts of its range. Mating begins in April, after it has aroused from hibernation. Gestation lasts 40–42 days. Young appear above ground in June; typical litter size is four to six, occasionally eight. Molting of winter hair in adults occurs about 2.5–3 weeks after the birth of young.

Conservation Status: China RL–LC.

References: Rogovin (1992).

Genus *Sciurotamias*—Rock squirrels

岩松鼠属 Yansongshu Shu—岩松鼠 Yansongshu

Medium-sized bushy-tailed squirrels. Habits terrestrial, rostrum long, but not longer than *Diromomys*, postorbital process reduced, skull low and flat, zygomatic plate not elevated. Both species of *Sciurotamias* are restricted to China.

Père David's Rock Squirrel

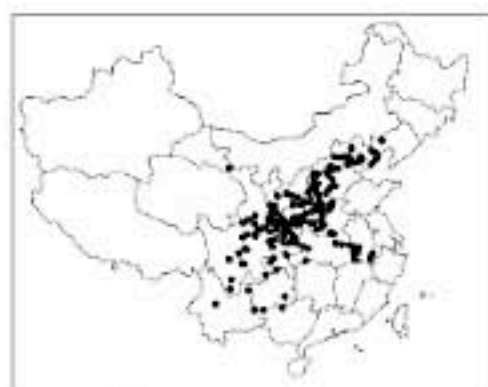
Sciurotamias davidianus

(Milne-Edwards, 1867)

岩松鼠 Yansongshu

PLATE 9

MAP 60



MAP 60. PÈRE DAVID'S ROCK SQUIRREL,
Sciurotamias davidianus

Distinctive Characteristics: HB 190–250; T 125–200; HF 45–59; E 20–28; GLS 52–58. Dorsum olive gray;

ventral pelage yellowish-white or ochraceous. No pale stripe on side. A dark line crosses the cheek. Soles of feet densely haired. Dental formula: 1.0.2.3/1.0.1.3 = 22, first upper molar present; baculum arched, edge projecting like a spoon in front of body. Skull wide and flattened, bullae small.

Distribution: Throughout C China. Endemic. Three subspecies: (1) *S. d. consobrinus* (Milne-Edwards, 1868–1874); W Sichuan; NE Yunnan; NW Guizhou; (2) *S. d. davidianus* (Milne-Edwards, 1867); Liaoning, Hebei, Beijing, Tianjin, Henan, Shanxi, Shaanxi, Gansu, Ningxia, Shandong, N Sichuan; (3) *S. d. saltians* Heude, 1898; Hubei, NE Guizhou, Sichuan, Chongqing, Henan, Anhui.

Natural History: Père David's Rock Squirrels favor rocky terrain and make dens in deep crevices between rocks. They show great agility, and while capable of climbing trees, apparently rarely do so. They do not hibernate. Known to collect and eat seeds that they carry in large cheek pouches. They are particularly adept at scatter hoarding the large acorns of the oak *Quercus liaotungensis*. They may reach high densities in places and may constitute an agricultural pest on occasion.

Conservation Status: China RL–LC.

References: Wang and Ma (1999).

Forrest's Rock Squirrel

Sciurotamias forresti (Thomas, 1922)

侧纹岩松鼠 Cewen Yansongshu

PLATE 9

MAP 61



MAP 61. FORREST'S ROCK SQUIRREL, *Sciurotamias forresti*

Distinctive Characteristics: HB 194–250; T 130–180; HF 47–54; E 25–27; GLS 54–60. Dorsum of head and body dark grayish brown, hairs ringed with black and buff. On the side a narrow white line runs from shoulder to hip; the dark line running below the white matches the back in color, turning ochraceous below and on the venter; ears buffy brown; sides of head, throat, and sides also ochraceous; ventral

Key to *Sciurotamias*

- 1.a. No pale stripe on side; dental formula: 1.0.2.3/1.0.1.3 = 22, first upper molar present; baculum arched, edge projecting like a spoon in front of body *Sciurotamias davidianus*
- b. Side of body with light stripe running from shoulder back toward rump; dental formula: 1.0.1.3/1.0.1.3 = 20; baculum flat and straight *Sciurotamias forresti*