Spencer Murray BES 485 – Winter 2014 South American Wildlands Biodiversity Research and Communication Project

The Chinchilla chinchilla

A description of the Chinchilla chinchilla

The *Chinchilla chinchilla*, also called the short-tailed chinchilla, is one of two species of chinchilla, which was previously known as *Chinchilla brevicaudata* until 1977 (Woods and Kilpatrick 2005). The species *C. chinchilla* has also called the Bolivian, Peruvian, and Royal chinchilla (Jiménez, 1996). It is about the size of a rodent and has, on average, a body that is heavier and longer than the other species of chinchilla, *Chinchilla lanigera*, although *C. lanigera* has a longer tail, which is why it is known as the long-tailed chinchilla.

The *C. chinchilla* is gray in color, with a body similar to a squirrel, and large ears like a mouse. They have extremely plush fur with over 50 hairs per single follicle, (humans have one hair per follicle; Meadow, 1969). *C. chinchilla* has also been described as being about the size of a small rabbit with long soft fur (Grau, 1986), and a species that has one of the softest, longest, and finest furs of any wild mammal (Sage 1913; Walker 1968; Mann, 1978).



Side view photo of C. chinchilla: www.chinformation.com

Ecology of the C. chinchilla and its role in the ecosystem

There is not much known about the ecology of the wild chinchilla, but what is known is that they live in colonies that can range from a few individuals to several hundred of the species (Mohlis, 1983). The *C. chinchilla* is a colonial species that feeds on vegetation and lives in rocky burrows or crevices in arid climates (IUCN Redlist: http://www.iucnredlist.org/details/4651/0).

The *C. chinchilla* lives at altitudes of 3,500 – 5,000 meters (~11,480 – 16,400 feet) with cold temperatures at night and low availability of food and water. Due to these characteristics of its environment it had developed physiological attributes that help to minimize its energetic requirements, such as having low basal metabolic and thermal conductive rates, and low energy cost requirements for maintaining their water balance compared to other rodents of similar size (Cortes et al, 2003). They prefer mountain grassland habitats where they can burrow through rock crevices, and since they are nocturnal, at night they use their whiskers to determine if a crevice is large enough to navigate through, and emerge at dawn and dusk to bask in the sun (<u>www.earthsendangered.com/profile-72.html</u>).

The diet of the *C. chinchilla* is one of the most difficult subjects to find evidence about, however mostly every internet source that I found explained the diet of the chinchilla species, both C. chinchilla and C. lanigera lumped together to be primarily herbivores, and in the wild they have been observed eating plant leaves, fruits, seeds, and small insects (http://brainmuseum.org/Specimens/rodentia/chinchilla/index.html). There have been studies, however, conducted about the diet of the *C. lanigera*. By combining information from data collected over 3 years, M. T. Serra analyized feces samples collected form the Chinchilla National Reserve in north central Chile, and concluded that chinchillas had a diverse diet consisting of mostly shrub leaves, and that the composition of their diet changed considerably from season to season (Serra, 1979). Also, Dr. Jamie E. Jiménez analyzed feces samples of C. lanigera, and found that when offered fresh and dead leaves of plant species, they preferred the dead and dry leaves mainly form herb plants, and showed no interest in the seeds or pods of native plants (Jiménez, 1990). This study also concluded that they feed on up to 24 plant species which were mainly herbs, and their diets change with variations in the seasons of the year and between locations (Jiménez, 1990).

Predators of the *C. chinchilla* include owls and hawks that can easily swoop down and grab the small species with their talons, snakes which can easily sneak up behind them, foxes, mountain lions, skunks, and wild felines and wild canines

(<u>http://brainmuseum.org/Specimens/rodentia/chinchilla/index.html</u>). Due to their small size the *C. chinchilla* can easily hide from predators in burrows, under logs, or in crevices that larger predators cannot gain entry to. Doctor Jamie Jiménez, a professor based at the University of North Texas, has done extensive research on the *C. chinchilla*, and according to him, C. chinchillas are preyed upon by Pseudalopex culpaues (culpeo fox), Bubo magellanicus (Magellanic Horned-Owl, Tyto alba (Barn Owl), and Glaucidium nanum (Austral-Pygmy Owl) (Jiménez pers. comm.).

The C. chinchillas population status and trend with references to historic baseline

The population of the *C. Chinchilla* is decreasing, and harsh winters regulate the population increases and decreases (IUCN Redlist), and there are no wild populations of *C. chinchilla* (Miller et. al., 1983). Since there is so little known about the ecology of *C. chinchilla*, it is unclear about their past distribution, population dynamics, and taxonomic status (Mann, 1978; Pine et al., 1979).

Captive breeding has decreased hunting of the wild chinchilla, however, often in captive breeding there is cross-breeding of the *C. chinchilla* and *C. lanigera* (Grau, 1986). From 1885 – 1910, intensive exploitation drove both species of chinchilla to near extinction (Miller, 1980), and because of this, the short-tailed chinchilla could have gone extinct at any time (Osgood, 1943).

Between 1840 and 1916, over 7 million chinchilla pelts were exported from Chile (Miller, 1980) but due to the fact that only about one-third of the pelts being exported were reported, the more likely estimate of the number of chinchilla being killed and/or exported was probably closer to 21 million (Albert, 1900).

As of 1990 the population of wild chinchillas was still declining, and Jamie E. Jiménez, Ph.D., offers four possible explanations for this: (1) the current populations are so low that the species cannot reach a minimum viable population to sustain long-term survival, (2) predation, especially by foxes in increasing, (though no evidence has been shown to support this), (3) longterm abiotic and/or biotic changes, and (4) it could be the surfacing of a long-term natural cycle of the chinchilla species (Jiménez, 1990; Jiménez et al. 1992; Jiménez, 1993).

In 2007, the carcasses of *C. chinchilla* were found in three separate sets of feces of *Lycalopex culpaeus*, a species of South American wild dog, in Argentina. This finding indicates that that the species, which was previously thought to be extinct in Argentina, may actually still be living there (Walker et al. 2007).

The current and historic range of C. chinchilla

C. chinchilla was once widely distributed throughout central Andes and adjacent mountains (Jiménez, 1996). Historically the *C. chinchilla* was dispersed throughout the Andes Mountains in Bolivia, Peru, northwestern Argentina and Chile, but has become regionally extinct in Bolivia and Peru (Tarifa 1996, Anderson 1997). There have been reports however that some have been seen in the Border regions of Bolivia and Peru by locals and park guides (IUCN Redlist), and the last time the *C. chinchilla* was spotted in the wild was circa 1953 (Jiménez, 1996).

Although the past distribution of both species of chinchilla is unclear, it has been reported that the species, was historically found from Talca, Chile north to Peru, and from the Chilean costal hills to the Andes and puna of Argentina, Bolivia, and Peru, with an overlap in range from approximately Huasco, Chile to Taltal, Chile (Grau, 1986; Housse, 1953; and Osgood, 1943).



*Image 1: A map showing the past distribution of wild chinchilla populations of *C. chinchilla* (black) and *C. lanigera* (gray) which has been modified according to Grau, 1986, and stars have been added to indicate current populations (as of 1990) according to Jiménez, 1990. (Jiménez,

1996)



*Image 2: Current habitat location of the C. chinchilla, bordering Bolivia, Chile, and Argentina,

based on maps provided by ESRI from the IUCN Redlist Page:



http://maps.iucnredlist.org/map.html?id=4651*

*Image 3: Current habitat location of the C. chinchilla, zoomed in, bordering Bolivia, Chile, and

Argentina, based on maps provided by ESRI from the IUCN Redlist Page:

http://maps.iucnredlist.org/map.html?id=4651*

The current legal protected status of C. chinchilla as determined by the IUCN Redbook

The current legal status of the *C. chinchilla* is designated as critically endangered (CR) by the International Union for Conservation of Nature's (IUCN) Red List (D'eila and Ojeda, 2008). This species is listed as critically endangered by the IUCN due to a drastic past population decline, however, the species has a chance of recovering due to the fact that domestic breeding is lowering the amount of them that are being trapped and hunted the wild (IUCN Redlist: http://www.iucnredlist.org/details/4651/0).

Relevant and interesting natural history and ecology of C. chinchilla

C. chinchilla's are believed to live in colonies of up to 100 individuals, and the species will mate two times per year and the females will give birth to one or two offspring each time, after a pregnancy or around 128 days (www.earthsendangered .com/profile-72.html).

The main importers of chinchilla pelts in the late 19th and early 20th century were the United States, England, Germany, and France, and as demand for the furs increased so did the cost per pelts, and the population dwindled (Albert, 1901). The price for a chinchilla pelt rose as high as \$170 in 1920 (Gigoux, 1928), and the steep decline in exports of chinchilla furs after 1900 reflects the species nearing extinction (Iriarte and Jaksic, 1986).



Graph 1: This graph depicts the amount in Chilean pesos paid per pelt of chinchilla fur from 1897-1910, while (according to Albert, 1901 and Opazo, 1911) 1901, 1903, and 1904 had no data available (Jiménez, 1996).

Threats to the existence of C. chinchilla and opportunities for its renewed abundance

The major threat to the extinction of the species has been hunting in the wild and overexploitation, however after extensive domestic breeding to meet the demand for furs and household pets, the threat of hunting in the wild is greatly reduced (IUCN Redlist: http://www.iucnredlist.org/details/4651/0).

Most chinchillas burrow to create tunnels in *Puya berteroniana*, a plant species that is endemic to the county of Chile, (Mohlis pers. comm. with J. E. Jiménez, 1995) but chinchilla trappers, known as Chinchilleros, used smoke, fire, and explosives to drive them out of their burrows, which leads to destruction of their habitat (Jiménez, 1995). "Chinchilleros used a variety of trapping methods including using small dogs and smoke to drive the chinchillas out of their burrows, excavation of the burrows of the chinchillas, use of stone, leghold and cage traps, snares, poles with hooks, fences to keep chinchillas from running away when driven from their burrows, poisonous baits, and even dynamite" (Albert, 1901; Opazo, 1911; Nazarit, 1913; Sage, 1913; Bowman, 1924; Wolffsohn, 1927; Birdlingmaier, 1937; Housse, 1953; MacClintosh, 1966; and Grau, 1986).

Commercial hunting of the *C. chinchilla* began in 1828 and the number being hunted rose steadily to meet demand for the fur in Europe and the United States, and between 1900 and 1909 there were more than half a million pelts per year being exported from Chile, and was considered as economically extinct there by 1917 (Jiménez ,1996), and rural hunters often supplement their diets by hunting *C. chinchilla* (Miller, 1983).

Another major threat to the population of the *C. chinchilla* is habitat fragmentation of their native habitat that has been brought about by urbanizing and developing the land that once was used as their habitat (Jiménez, 1994). In the habitat of *C. chinchilla*, the loss of *Balsamocarpon brevifolium* shrub, resulting from burning and its over harvesting due to its tannin-rich pods, has also contributed in the declining population of the species (Munoz, 1971).

According to Dr. Jamie E. Jiménez, another threat to the *C. chinchilla* is Chagas disease, a tropical parasitic disease caused by Trypanosoma cruzi, which is spread mostly through the insects known as Triatominae and is common throughout Central and South America (Jiménez pers. comm.; http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0002348/).

Developments in conservation of C. chinchilla

As early as 1890, the extinction of the chinchillas of South America was foreseen (Albert, 1901), and in 1898 regulations for hunting chinchillas was implemented, but was hardly

regulated (Miller, 1980). The first international effort to protect the species came with the treaty of 1910 between Chile, Bolivia, Argentina, and Peru, which banned the hunting and commercialization of the species (Grau, 1986). This treaty however drove the prices for the prized pelts to 14 times higher than they were before the treaty existed, thus contributing to the demise in chinchilla populations (Iriarte and Jaksic, 1986).

To my knowledge there has not been a siting of live *C. chinchilla* in the wild since 1953, but in 1975, Connie Mohlis and Baldomero Pena, a former chinchillero, re-discovered a wild *C. lanigera* population, and this was a major step forward in the conservation of the species, and in 1983 started the first scientific study of the species in the wild (Jiménez, 1996).

In Chile, although chinchilla protection laws were established in 1929, they were not enforced until 1983 when the Chinchilla National Reserve, a 16.3 square mile preserve located just North of Illapel, Chile, was created, (Jiménez, 1996) This is the only reserve for wild chinchillas in their native region, and as of now there are no other reserves in Argentina, Bolivia, or Peru. There has also been combined efforts from the CONAF: the Chilean Forest Service, Chilean universities, and the World Wildlife Fund (WWF) to study and protect the species. (Jiménez, 1996).

Save the Wild Chinchillas, Inc. is a non-profit organization dedicated to the conservation of wild chinchillas that strives to ensure that the species' will not go extinct. According to their website, in order to meet that goal, they have three objectives, "educate people of all ages, collect funds to protect land and create sustainable preserves, promote awareness, and foster research" (www.wildchinchillas.org).

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