

## Mitigating Puma-Human Conflict in Chile

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### Background and Methodology

When Darwin (1845) visited Chile on the Beagle he noted that puma (*Puma concolor*) attacks on livestock were surprisingly common. Equally common was the response he reported, that pumas were “generally driven up bushes or trees, and then either shot or baited to death by dogs.” He believed that puma depredation of livestock was prevalent because of the scarcity of other quadrupeds. However, in the many years since Darwin’s voyage, this hypothesis and other questions surrounding puma-human conflict in Chile have not been investigated. On the contrary, data on puma-human conflict is unreliable and often unsubstantiated. The cryptic and crepuscular nature of pumas tends to exacerbate this problem, as their behaviour is more conducive to myth and story than hard fact. Because of pumas’ mythical status they may be blamed for depredations that they did not commit.

More recently, pumas have been afforded complete legal protection throughout Chile. Though protection is a necessary step for the preservation of the species, it may also increase conflict and lead to stronger negative perceptions of pumas among local stakeholders. Not only do livestock owners bear the economic costs of depredation if they retaliate against pumas, they are at risk of severe legal consequences. If, on the other hand, stakeholders report puma depredation events to the Agriculture and Livestock Service (SAG) the outcome for both human and puma interest is equally uncertain. Upon receiving a depredation report, SAG’s standard protocol has been to attempt to capture and translocate pumas in the area to a different area. Over a 10-year period, from 1991-2001, SAG captured 23 pumas from the IX region of Chile and released them into protected areas. Of this group, 12 pumas have been released into a protected area with an estimated 256.05 km<sup>2</sup> of suitable habitat (Conguillío National Park) and a further 8 pumas have been released into another protected area with 460.00 km<sup>2</sup> of suitable habitat (Villarrica National Park). The remaining two pumas were each released into smaller protected areas.

Nothing is known about the outcome of these expensive and time-consuming translocations. However, translocating pumas may be tantamount to killing them, as survival rates of translocated pumas have been shown to be lower than survival rates of pumas in reference populations. Concerns over the effects of translocation on protected ecosystems have led Chile’s Forestry and Parks department (CONAF) to prevent further translocations to national parks. As a result, the SAG currently translocates pumas from one developed area to another, often less than 70km apart, and has little recourse in how they manage puma-human conflict. Also, the SAG does not have the economic resources to scientifically study puma-human conflict.

This project is investigating both sides of the conflict. The first line of study will examine the human dimension of the conflict by surveying relevant stakeholders in localities surrounding the protected areas of the IX region. To fully comprehend the human dimension, questionnaires will include such relevant information as socio-cultural background, history of depredation, type of livestock management and perceived risk and value of the puma. The initial survey is essential to determine the type of management and conflict resolution that local stakeholders demand. At the same time, this initial census will allow us to establish a network of

relevant livestock owners and landholders who may often contemplate puma depredation and abundance.

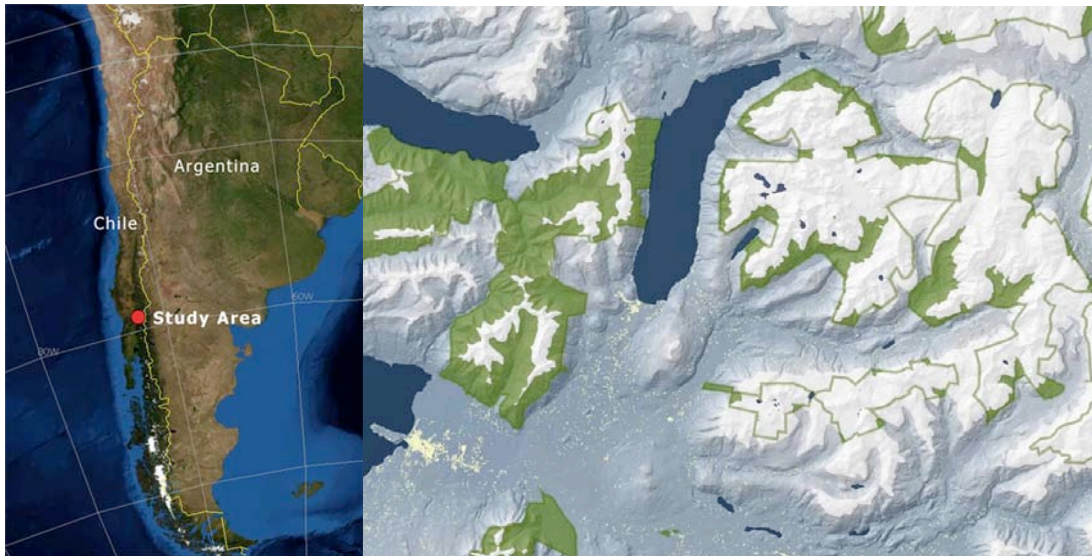


Figure 1 The left map shows the location of study area in Chile. The right map is a detailed view of the study area. The protected areas (and their limits) are highlighted in green. These areas include public protected areas (SNASPE) and private initiatives for conservation. The line of permanent snow during winter is normally at an altitude of 1100m above sea level (shown in white); although during a harsh winter it may be as low as 800m above sea level. Yellow dots represent human development in the lower valleys, which surround protected areas. The high density of yellow dots in the lower left corner represents the town of Pucón (with a population of approx. 8,000 inhabitants).

This network of local contacts will prove instrumental in later constructing a comprehensive conflict database. Through acquiring the trust of local stakeholders we hope to investigate reports of puma depredation. By investigating and verifying puma depredation based on visual record, or (more commonly) necropsy, we will have a valuable indicator of false reports of puma predation. Once a database of verified depredation events is developed trends in conflict may be analyzed and hotspots identified.

Another important component of the study is to determine areas of puma habitat that are currently unprotected. Identifying suitable puma habitat in the IX region of Chile is of particular concern because the current protected areas may provide insufficient winter habitat for the puma population. The majority of National Protected Areas are located at an altitude above 1100m and experience heavy snow and harsh conditions during the winter. Forests at lower altitude, which support higher biodiversity, tend to be privately owned and are under threat from logging, environmental degradation and extreme tourism pressure during certain parts of the year. Seasonal trends in depredation could prove especially revealing if pumas are forced into areas of livestock human development during the winter.





to joining the WildCRU, D. Phil student, Tucker Murphy received his Masters degree in Zoology from Oxford. He has also worked on two puma projects, the Wildlife Conservation Society's Greater Yellowstone Cougar DNA Study and Ken Logan's 10-year Uncompahgre Plateau Puma Project. Through these pursuits he has gained extensive experience performing field necropsies on puma prey and recognizing the signs left behind by this cryptic species. This project will combine his interest in zoology with two of his undergraduate pursuits: Spanish and anthropology