FIRST AERIAL SURVEY OF HISTORICAL RANGE FOR PENINSULAR PRONGHORN OF BAJA CALIFORNIA, MEXICO

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ABSTRACT

The peninsular pronghorn (*Antilocapra americana peninsularis* Nelson) was described and its historical range was defined by Nelson of Baja California, Mexico (1912, 1925). In 1993, we conducted an aerial survey of the peninsular pronghorn historical range to determine present distribution and general habitat condition. The historical range has been reduced approximately 90 percent. The Vizcaíno Desert, where some 200 individuals are currently found, is the last refuge for this endangered subspecies. Recommendations are listed for future restoration of the subspecies and its habitat.

INTRODUCTION

All three subspecies of pronghorn endemic to Mexico are critically endangered: particularly, the peninsular subspecies, which has been declared officially endangered (Diario Oficial 1991, International Union for Conservation of Nature and Natural Resources 1988). This subspecies is isolated from all other pronghorns and has received little attention or study. Published reports have been primarily limited to distribution and abundance (Nelson 1925, Leopold 1959, Huey 1964, Monson 1968). Despite calls for the protection of this subspecies, there have been no published articles primarily devoted to it. Since 1977, several surveys have been conducted to monitor the status of the subspecies (Cancino 1988, Jaramillo 1989), but these surveys have been limited to the Vizcaíno Desert which is a small portion of the animal’s original range (Hall 1981). Consequently, we surveyed the entire former peninsular pronghorn distribution, and provide recommendations for management. This report presents the results of the first aerial survey for historical and contemporary habitat of peninsular pronghorn.

MATERIAL AND METHODS

Study area.

The historical rangeland of peninsular pronghorn (Hall 1981; Figure 1) was divided into six zones: San Felipe Bay, San Quintin Bay, Los Angeles Bay, Vizcaíno Desert, San Ignacio Lagoon, and Magdalena Bay. These zones were delineated from records of Hall (1981), and modified by the availability of flight facilities.

The topography in the six zones consists of plains, low hills, plateaus, and dry stream beds. The vegetation is dominated by low shrubs (*Frankenia palmeri* and species of *Atriplex* and *Encelia*) as described by Brown and Webb (1979).

The aerial surveys were conducted over eight days in May, 1993, using a Cessna 182 airplane with two observers and pilot. Flights were performed in west-east transects; with additional flights along dry stream beds. Transect length varied according to physiography. Distance between transects ranged from 2,000 to 2,500 m, depending on the characteristics of the vegetation. Average flight height was 150 m and average speed of 80 knots.

RESULTS

Table 1 shows the search effort for each zone. A total of 279 transects were made during approximately 18 hours; however, we additionally surveyed 11 of the largest dry stream beds in approximately four hours (Table 1). Our observations on habitat changes for human uses and pronghorn sightings were: San Felipe Bay: There are big human settlements, roads, highways, airports, and fish camps, but little agricultural activity. There were few large tourist developments. Neither our survey nor observations by residents (E. 

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Table 1: Search effort and results.

<table>
<thead>
<tr>
<th>Zone</th>
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<th>Sightings</th>
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Figure 1. Historic distribution of peninsular pronghorn in the Baja California peninsula (modified from Hall 1981).

Table 1. Zones and search effort for peninsular pronghorn during 1993 surveys.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Number of transects/Time</th>
<th>Number of dry stream beds/Time</th>
<th>Approximate extension km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Felipe</td>
<td>59/3 h 47 min</td>
<td>4/1 h 7 min</td>
<td>3,500</td>
</tr>
<tr>
<td>San Quintin</td>
<td>38/2 h 13 min</td>
<td>1/28 min</td>
<td>2,500</td>
</tr>
<tr>
<td>Los Angeles Bay</td>
<td>49/3 h 12 min</td>
<td>2/39 min</td>
<td>3,000</td>
</tr>
<tr>
<td>Vizcaino Desert</td>
<td>54/3 h 23 min</td>
<td>1/46 min</td>
<td>6,000</td>
</tr>
<tr>
<td>San Ignacio</td>
<td>53/3 h 35 min</td>
<td>2/46 min</td>
<td>3,500</td>
</tr>
<tr>
<td>Magdalena Bay</td>
<td>26/1 h 44 min</td>
<td>1/23 min</td>
<td>2,500</td>
</tr>
<tr>
<td>Total</td>
<td>279/17 h 54 min</td>
<td>11/4 h 18 min</td>
<td>21,000</td>
</tr>
</tbody>
</table>
Mellink, pers. comm.) detected pronghorn. **San Quintín Bay:** There were few settlements and many agriculture developments. No pronghorn were detected. **Los Angeles Bay:** There were agriculture fields and human settlements but fewer when compared to the San Felipe or San Quintin Bay zones. Tourist developments were present. We did not detect any pronghorn. **Vizcaino Desert:** Peninsular pronghorns were located in the western section of the desert, despite the presence of cattle, agriculture fields, fish camps, small towns, roads and mines. We did not observe pronghorn in the eastern portion of the Vizcaino Desert. **San Ignacio Lagoon:** There were fish camps, human settlements and cattle in this zone; habitat changes due to agricultural activity were sparse. Independent of our survey, pronghorns were observed in the northern part of the area (M. Agüero, pers. comm.). **Magdalena Bay:** The vegetation is quite different when compared to other zones. A high level of disturbance was observed: including many agriculture fields, cattle and horses, human settlements, fish camps and other habitat changes. We did not detect pronghorn.

**DISCUSSION**

A 1993 survey of the historical occupied habitat of the peninsular pronghorn disclosed they were currently restricted to the Vizcaino Desert and San Ignacio Lagoon areas (Figure 2). Our results indicate the peninsular pronghorn distribution has decreased from 40,000 km² to 5,000 km², approximately 90%.

Most reports regarding population trends recommend continuous monitoring (Firshow et al. 1990, Johnson et al. 1991, O'Gara and Yoakum 1992). Since 1977 peninsular pronghorn population monitoring has been conducted only in the Vizcaino Desert (Cancino et al. in prep.). This is the first population survey for the entire historic range, and attempts to locate potential restoration sites. Our assessment was that two areas near the Vizcaino Desert may provide additional habitat for a recovery plan.

![Map of Baja California Peninsula showing historical and current ranges of pronghorns](image-url)

**Figure 2.** Contemporary distribution of peninsular pronghorn in the Baja California peninsula based on that portion of the historical range studied during this first aerial survey in 1993.
The main changes in historical compared to current peninsular pronghorn habitat were: 1) Agriculture. In 1976, there were approximately 238,665 ha under cultivation in the peninsula; by 1989 there were 7,000 ha fewer (Anonymous 1990). By 1990, 3,352 ha were seeded in the Vizcaino Valley, Mulege, Baja California Sur (Anonymous 1991), the nearest agriculture area to habitat presently occupied by peninsular pronghorn. 2) Dirt roads. About 1,500 km of dirt roads were developed for oil exploration in the Vizcaino Desert (Jaramillo 1989). Other dirt roads have been developed for access to ranches, firewood extraction, cattle management many of which have aided in access for illegal hunting. 3) Cattle industry. Despite arid conditions, cattle grazed pronghorn habitat thereby increasing potential forage competition for preferred nutritious herbs (O’Gara and Yoakum 1992). In the peninsula, the number of cattle from 1977 to 1988 period increased from 293,875 to 356,693 (Anonymous 1990). Jaramillo (1989) estimated that 5,000 head inhabited the Vizcaino Desert. 4) Tourist developments. These developments are in two zones of the peninsular pronghorn historic range: San Felipe Bay and Los Angeles Bay. 5) Hunting. Although legal hunting has been forbidden by law since 1922 and official reports are scarce, there is evidence of illegal pronghorn kills in the Vizcaino Desert. Rifle cartridges and recent vehicle tracks in the pronghorn habitat, and reports from ranchers indicate illegal hunting apparently occurs.

RECOMMENDATIONS

Vizcaino Desert. --Pronghorn have been negatively recorded outside of this area since 1977. Approximately 200 pronghorn currently inhabit the Vizcaino Desert (Cancino et al. in prep.). Although this zone is protected as a Biosphere Reserve in the National System of Protected Areas of Mexico (Diario Oficial 1988) and the peninsular pronghorn is classified as endangered (International Union for Conservation of Nature and Natural Resources 1988, Diario Oficial 1991), a recovery plan has not been developed and is needed.

Los Angeles Bay and San Ignacio Lagoon. --These zones near the Vizcaino Desert should be considered for future translocations. More pronghorn may pioneer to San Ignacio Lagoon in the future, however, this may incur as a slow, natural return as described by Einarsen (1948).

San Quintín, Magdalena Bay and San Felipe Bay. --It is suggested that these zones not be considered in a recovery plan. Nelson (1925) and Elliot (1903 cited in Hall 1981), included San Quintín and Magdalena Bay in historical distribution, consequently both were included in this search. However, there is no reference to pronghorn presently existing in these zones by Leopold (1959) or Huey (1964) and both of these areas have been drastically disturbed to serve human needs. Monson (1968) questioned Magdalena Bay as part of historic range.

CONCLUSIONS

Extensive changes in the historic habitat of the peninsular pronghorn have occurred, and 90% of the original habitat is currently not occupied. However, the San Ignacio Lagoon and Los Angeles Bay areas should be evaluated in greater detail to determine if they currently have sufficient factors favoring translocation endeavors.

Currently the Vizcaino Desert is the last refuge of the peninsular pronghorn and a recovery plan should be developed to include vigilance, environmental education, and maintenance of a semicaptive herd for research. Measures should be taken to avoid additional disturbances to the natural habitat and a program of biological and ecological research is encouraged.

ACKNOWLEDGMENTS

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LITERATURE CITED


DIARIO OFICIAL. 1991. Acuerdo por el que se establecen los criterios ecológicos CT-CERN-001-91 que determinan las especies raras, amenazadas, en peligro de extinción o sujetas a protección especial y sus endemismos, de la flora y fauna terrestres y acuáticas en la República Mexicana. Diario Oficial de la Federación CDLII 12:7-35.


