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Michael Mohler
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Subject: Pacific Pocket Mouse Habitat Assessment for Newport Banning Ranch

Dear Mr. Mohler:

This letter details the methods and results of our reconnaissance-level survey for suitable habitat for the Pacific pocket mouse on the Newport Banning Ranch site. Based on this assessment, the site appears to have very low potential to support the Pacific pocket mouse; consequently, additional surveys or trapping studies do not appear to be necessary nor are they recommended at this time. However, the assessment includes recommendations regarding trapping studies should such studies be determined necessary by the U.S. Fish and Wildlife Services (USFWS).

Species Background

The Pacific pocket mouse (PPM), at 5-9 grams, is one of the smallest members of the genus *Perognathus*. The species *P. longimembris*, as a whole, occupies a variety of habitats throughout the southwest, including desert shrub, shrub-steppe, arid woodland, sage scrub, grasslands and ruderal habitats. The PPM, which is one of 16 currently recognized subspecies of *P. longimembris* (Williams et al. 1993), is restricted to the coastal plain and historically was found between El Segundo in Los Angeles County and the Tijuana River Valley on the U.S. and northern Baja California, Mexico. It has been reliably recorded within 2.5 miles of the coast (USFWS 2010). It was thought to mostly occur in fine, sandy soils within coastal scrub, coastal strand, coastal dunes, and river alluvium (USFWS 2010). However, it has been found in a broader range of soils, including loamy sand, sandy loam, loam, clay loam, and terrace escarpments where fine sandy soils were not available (USFWS 2010). It appears to occur in areas with moderate shrub cover, but also with some openness for foraging (USFWS 2010). For example, on an occupied site in Dana Point it was found in areas with about 57% shrub cover and 33% bare ground, while an unoccupied site had 74% shrub cover and 13% bare ground (Germano 1997, as cited by USFWS 2010). The density of the herbaceous cover (grasses and forbs) at ground level, however, may be a more important factor for PPM occurrence than density of shrub cover, with the species avoiding areas with dense grasses and forbs (USFWS 2010).

Currently PPM is only known from the Dana Point Headlands in southern Orange County and three locations (two of which may represent one population) on the Marine Corps Base, Camp Pendleton in northern San Diego County (Spencer and Schaefer 2000; USFWS 2010). All known occupied sites are currently threatened by habitat fragmentation (USFWS 2010). The Dana Point population is completely isolated by urban development, and two of the Camp Pendleton populations (Oscar 1 and Edson Range) support military training (USFWS 2010).

PPM individuals have been observed to be most active on the surface (and thus detectable through live-trapping) during the months of April through mid-September. However, their surface activity periods can be quite variable from year to year and site to site. Summer dormancy has been observed as early as mid-June and July, and may be related to low precipitation and associated low plant and seed production (USFWS 2010). For this reason, detectability can also vary.

The closest documented historical and current records for PPM relative to the Newport Banning Ranch site are: Spyglass Hill in Newport Beach approximately 5 miles southeast of Newport Banning Ranch, which was developed in 1972; the Clifton/Wilmington area in Los Angeles County approximately 23 miles northwest of Newport Banning Ranch; and Dana Point Headlands approximately 18 miles southeast of Newport Banning Ranch (USFWS 2010). As of 2010, at least 82 PPM assessments have been conducted from Los Angeles County south to the U.S./Mexico border since it was emergency listed in 1992 and only the four sites noted above are currently known to have extant populations.

Previous Studies

LSA Associates, Inc. conducted small mammal live-trapping on the Newport Banning Ranch in June (3 consecutive nights) and September (2 consecutive nights) in 1995 totaling 1,522 trap nights (Erickson 1995). Traplines were concentrated in the upland portions of the site. Five rodent species were captured, including western harvest mouse (*Reithrodontomys megalotis*; 22 captures), deer mouse (*Peromyscus maniculatus*; 112 captures), cactus mouse (*Peromyscus eremicus*; 1 capture), black rat (*Rattus rattus*; 6 captures), and house mouse (*Mus musculus*; 12 captures), the latter two of which are non-native, invasive species associated with urban development. Both the western harvest mouse and deer mouse are also common in urbanized areas. The PPM was not trapped, and notably, the California pocket mouse (*Chaetodipus californicus*), which is fairly common in coastal scrub in Orange County, was not captured. Erickson (1995) indicated in the 1995 report, that surveys for PPM in 1990 were also negative.

Survey Methods

A reconnaissance-level survey of the Newport Banning Ranch site was conducted by Dudek biologist Phil Behrends, Ph.D. for suitable habitat for the PPM. Dr. Behrends possesses a state of California Memorandum of Understanding and a federal permit (TE031287-7) authorizing work on the PPM.

Dr. Behrends is a mammal specialist with 34 years of experience with heteromyid rodents (pocket mice and kangaroo rats).

The survey was conducted on July 23, 2012 from approximately 0900 to 1400 hours. Weather conditions at the time of the survey were overcast in the morning to mostly sunny in the afternoon, with an air temperature of approximately 65 degrees to 73 Fahrenheit. Winds ranged from calm in the morning to a light (3-5 mph) westerly breeze in the afternoon. Soil conditions on the site were dry.

Because the site is approximately 400 acres in size, the reconnaissance survey entailed inspecting representative areas of the site that, based on vegetation communities, have at least some potential to support the PPM, including open coastal scrubs, grassland, and ruderal communities underlain by sandy loam soils. These areas were identified both from a review of the site vegetation map and by systematically driving along the numerous roads throughout the site to identify appropriate areas for closer, on-foot visual inspection. The assessment of the site was limited to identifying areas with the relative highest potential to support the PPM; i.e., areas of relatively open vegetation. There currently is no accepted survey method based on indirect surface sign (e.g., scat, tracks, burrows, runways, etc.) for determining presence/absence of the species on a site. Where suitable PPM habitat is identified and there is a reasonable expectation that the species could be present, live-trapping studies are conducted to provide a reliable determination of presence/absence. Therefore, the habitat assessment was based on the professional judgment of Dr. Behrends, as an authorized PPM biologist, rather than direct or indirect field evidence of PPM presence or absence.

Results

Based on a review of the vegetation map (Bonterra 2012) and the PPM's known habitat associations, several communities were considered to have relatively low potential to support PPM. These communities include willow riparian forest, willow riparian scrub, mule fat scrub, marshes, *Arundo*, mudflat, and ornamental (primarily Hottentot fig which covers large areas throughout the site). These communities are most common in the northwestern lowland portion of the site. Further, these areas are subject to periodic flooding and inundation in the winter (T. Bomkamp, pers. comm. 2012), making them unsuitable habitat for PPM. The main habitat assessment effort in these areas entailed driving along the roads and stopping periodically to directly view the vegetation patches to confirm that the habitat patches did not contain openings that may be suitable for PPM. Most of the bare ground in the lowland areas is along the well-traveled roads and maintained cleared areas around oil production facilities. The interior areas of the habitat patches support dense herbaceous, shrub, and/or tree vegetation that is unsuitable for PPM. With the exception of one area, no potentially suitable habitat for PPM was found in the lowland areas. The one area with at least some potential for PPM is located along the southern edge of the lowlands and is shown on the attached figure as site "A". While the lowlands in general are considered to have very low potential for PPM due to the presence of dense wetland/riparian and ruderal vegetation, this site supports openings in the salt

marsh habitat and sandy soils. If trapping on the site is conducted, site “A” should be considered. If the species is absent from this area, it is highly unlikely it would occur elsewhere in the lowlands.

Several of the coastal scrub communities on site, as least based on the vegetation map, appeared to have some potential for PPM. However, the on-foot site inspection found that most of the scrub communities onsite were unsuitable for PPM for one or more reasons. The coastal bluff scrub along the southern and southwest edges of the site is on very steep, eroded bluffs. PPM does not occur on this type of steep terrain, so these areas were determined to be unsuitable for the species. Likewise, the larger patches of southern cactus scrub and undisturbed encelia scrub in the eastern portions of the site tend to occur on steep canyon slopes and generally have very dense, impenetrable cover with few openings suitable for PPM, which prefers low to moderate shrub cover. A visual inspection of these communities from the edges of the habitat patches failed to detect openings that would be suitable. Because these scrub communities on site are unsuitable for PPM, little time was spent walking through these communities.

The vegetation communities most suitable for PPM on the site are annual grassland and disturbed scrubs on gentle slopes, and most of the on-foot inspection was spent in these communities. For the most part, the annual grasslands on the site support ground cover too dense for PPM, with most areas having close to 100% cover, except the ground squirrel burrow systems and gopher diggings. Two areas were identified as having relatively higher potential for PPM; sites “B” and “C”.

Site “B” shown on the attached figure, is located in the northeast corner of the site. Site “B” supports sparse scrub dominated by deerweed underlain by gravelly-sandy soils with smaller patches of fine sands. However, this patch is relatively small in size and bordered by unsuitable habitat, so if PPM is present, it likely would be limited to this area.

Site “C” shown on the attached figure is located in the southeastern portion of the site on the large marine terrace. It occurs within a large patch of grassland, the vast majority of which is too dense for the PPM. Site “C” is a relatively small area within the large habitat patch with sparser cover and more friable sandy soils.

Discussion

Overall, the site appears to have very low potential to support PPM and additional surveys or trapping studies do not appear to be necessary nor are they recommended at this time. This conclusion is based on past and current land uses, vegetation, soil conditions, and the results of past surveys.

Land Uses

For over 60 years much of the site has been used for oil drilling and production operations, with approximately 400-500 wells and supporting infrastructure located throughout the site. Historical and ongoing site maintenance has included mowing most open grass and weedy areas at least two

times per year depending upon the seasonal rainfall, and to periodically clear vegetative growth along oil pipelines, gas pipelines, perimeter fencing, utilities and well pad areas throughout the field. The site inspection indicated that these maintenance practices generally are not compatible with maintaining suitable PPM habitat due to mechanical disturbances. While small pockets of friable sandy soils were present, most of the grassland and open coastal scrub habitats are underlain by compacted soils that provide a poor burrowing substrate for small, weak burrowing rodents such as PPM. The only evident burrowing and digging activity in the grasslands areas was from California ground squirrels and Botta's pocket gopher.

Surrounding land uses, including extensive residential, commercial, and light industrial development appear to be little changed since the early 1970s. The only undeveloped adjacent area is Fairview Park to the north.

Soils

The marine terraces on the site support Myford sandy loam on 0-2% slopes (Wachtell 1978). The drainages onsite support Myford sandy loam on 9-40% slopes, eroded. The lowland areas on the northwest portion of the site support Bolsa silt loam and tidal flats. Myford sandy loam is a moderately well drained soil that formed in sandy sediments. The surface and subsurface layers are a sandy loam about 12 inches deep. The upper six inches of the subsoil is a sandy clay and the next 17 inches is a clay loam (Wachtell 1978). While PPM is found in sandy loams and other substrates consistent with the Myford series, most of the soil on the site is compacted and does not appear to provide a suitable burrow substrate for the PPM. However, as noted above, PPM have been found in association with a variety of soils substrates and does not appear to be limited to areas with fine, sandy soils (USFWS 2010). Therefore, soils probably are not a limiting factor for PPM on the site.

Vegetation

As described above, the vegetation on site generally is not suitable for PPM. The coastal scrubs on the canyon slopes tend to be very dense, with virtually 100% cover in many areas. There are no openings with bare ground that would be suitable for PPM. The annual grasslands on the marine terraces are dense in most areas with the grass/forb cover approaching 100% at ground level. In these areas, the only openings in the cover are at ground squirrel burrows and pocket gopher diggings. These areas also support few shrubs that would provide cover and refuge for PPM. As noted above, two areas – sites “B” and “C” were identified as having the highest potential to support PPM on site, although the potential for PPM even at these sites is considered to be low.

The lowland area is a mosaic of mule fat, willow riparian, alkali marsh, ruderal and disturbed areas dissected by a network of access roads. Except for the roads and areas that have been cleared around oil production facilities, the lowland vegetation is very dense and unsuitable for PPM. Further, the lowland area is subject to period flooding and inundation in the winter and therefore does not provide year-round habitat for PPM. One area – site “A” – was identified as the area with the highest

potential to support PPM in the lowland area, but the overall potential of PPM presence in this area is still considered to be very low.

Past Surveys

As describe above, trapping on the site was conducted by LSA Associates, Inc. in 1990 and 1995 (Erickson 1995). The PPM was not documented on the site, and in 1995 four of the five species captured (western harvest mouse, deermouse, black rat, and house mouse) are common in disturbed habitat areas close to urban development. Also, a relatively common coastal scrub rodent species – California pocket mouse – was not captured in more than 1,500 trap nights and only one cactus mouse (which is also relatively common in scrub habitat) was captured, indicating a relatively depauperate rodent community on site. Given the apparent absence of the PPM on site in 1990 and 1995, the fact that the site has been virtually surrounded by development, and the nearest known occurrence of PPM (Spyglass Hill 5 miles to the southeast) was developed in the early 1970s, there is no virtually no chance that the PPM has colonized the site from an off-site area since the other surveys were conducted.

Conclusion

Based on past and current land uses, vegetation, soil conditions, and the negative results of past surveys (1990 and 1995), the site overall appears to have very low potential to support the PPM. Accordingly, additional surveys or trapping studies do not appear to be warranted and are not recommended at this time. Nonetheless, if trapping is determined to be warranted by the USFWS, three sites – sites “A” through “C” have been identified as having the highest relative potential to support PPM. These areas overlap some of the sites trapped by Erickson (1995). If focused surveys are conducted in these areas with negative results, it is highly unlikely that PPM would be present elsewhere on the site.

Sincerely,



Phil Behrends, Ph.D.
Senior Biologist

Att.: *Figure: Recommended Trapping Areas for the Pacific Pocket Mouse*

Literature Cited

- Erickson, R. 1995. 1995 Banning Ranch Rodent Trapping. Letter report prepared by LSA Associates, Inc. for Leonard Anderson.
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- U.S. Fish and Wildlife Service. 2010. "Pacific Pocket Mouse (*Perognathus longimembris pacificus*) 5-Year Review: Summary and Evaluation." Carlsbad Fish and Wildlife Office Carlsbad, California.
- Williams, D.F., H.H. Genoways, and J.K. Braun. 1993. "Taxonomy." In *Biology of the Heteromyidae*, edited by H.H. Genoways and J.H. Brown, 36–196. Special Publication No. 10 of the American Society of Mammalogists.

