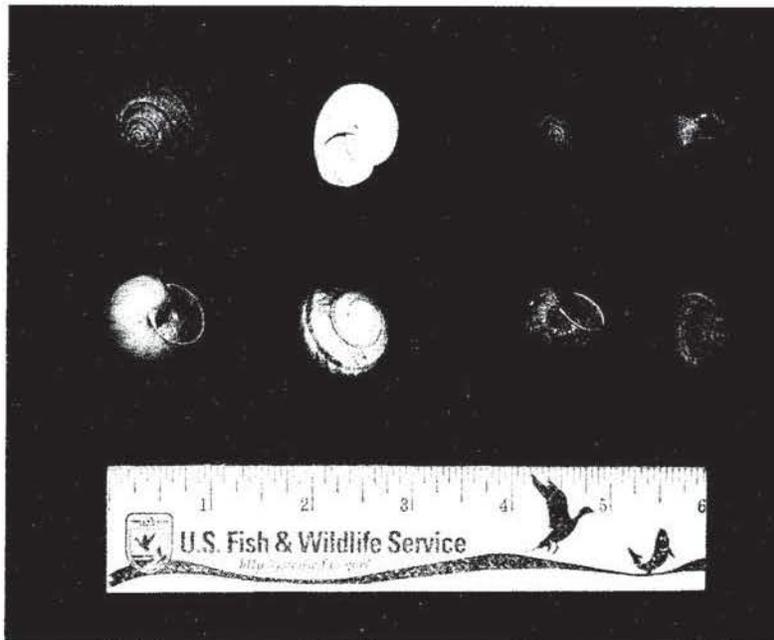


## Banded Dune Snail

*(Helminthoglypta walkeriana)*

[=Morro shoulderband snail (*Helminthoglypta walkeriana*)  
and Chorro shoulderband snail (*Helminthoglypta morroensis*)]

### 5-Year Review: Summary and Evaluation



*Helminthoglypta walkeriana*    *Helminthoglypta morroensis*

**U.S. Fish and Wildlife Service  
Ventura Fish and Wildlife Office  
Ventura, CA**

September 11, 2006

## 5-YEAR REVIEW

### Banded dune snail (*Helminthoglypta walkeriana*) [=Morro shoulderband snail (*H. walkeriana*) and Chorro shoulderband snail (*H. morroensis*)]

#### I. GENERAL INFORMATION

**A. Introduction:** The banded dune snail (originally classified as *Helminthoglypta walkeriana*) was listed as endangered on December 15, 1994. At the time of listing, it was considered to be a single species composed of two subspecies or varieties (*H. w. walkeriana* and *H. w. morroensis*). *Helminthoglypta walkeriana morroensis* was thought to be extinct when the species was first listed but has since been rediscovered. Recent work by Roth and Tupen (2004) has resulted in the recognition of these two subspecies as full species, *H. walkeriana* and *H. morroensis*. Because of the potential for this taxonomic change to cause confusion in this document, the following names will be used in this review. In instances where we are discussing the entity that we listed (*Helminthoglypta walkeriana*, which included both *H. w. walkeriana* and *H. w. morroensis*) or when it is unclear which species is being discussed (as is the case with older documents), the common name “banded dune snail” will be used. However, when it is clear which species is being referenced, the names “Morro shoulderband snail” (*H. walkeriana*) or “Chorro shoulderband snail” (*H. morroensis*) will be used.

**B. Methodology used to complete the review:** We, the U.S. Fish and Wildlife Service (USFWS) published a Federal Register (FR) notice (70 FR 39327) announcing our initiation of a 5-year review of the banded dune snail and asked the public for information. We reviewed the information in our files regarding the banded dune snail including all scientific papers, survey reports, and letters to and from the Ventura Fish and Wildlife Office regarding the snail. We spoke with snail experts and knowledgeable individuals regarding new information that has been acquired since its listing as well as any other pertinent information regarding the Morro shoulderband snail and Chorro shoulderband snail. We also solicited independent opinions from knowledgeable individuals who have expertise with the species, with the geographic region where the species occurs, and/or familiarity with the principles of conservation biology. We incorporated all comments and information from our files and the public into our review as appropriate.

#### C. Reviewers

**Lead Region --Contact name(s) and phone numbers:**

CNO: Diane Elam, 916.414.6464  
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VFWO: Mark Elvin, Biologist, 805.644.1766  
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## D. Background

1. **FR Notice citation announcing initiation of this review:** The Federal Register (FR) notice initiating this review was published on July 7, 2005 (70 FR 39327). This notice opened a 60-day request for information period which closed on September 6, 2005. A second FR notice was published on November 3, 2005 (70 FR 66842) that extended the request for information period for an additional 60 days until January 3, 2006.

2. **Species status:** In the October 2005 recovery data call, we listed banded dune snail populations as stable to increasing, which is also the case for both of the newly recognized species. At the time of listing, the Chorro shoulderband snail was thought to be extinct but has since been rediscovered. Additional individuals of both species are being found every year and in a wider variety of habitat types. This could be due to an actual increase in numbers (due to better conservation efforts for banded dune snails after its listing) or may simply reflect the fact that more people are now looking for these species in more places and observing more individuals of a stabilized population. Additionally, more areas within designated critical habitat are being preserved (e.g., more land that is essential for the survival and recovery of the snail is being acquired and conserved).

3. **Recovery achieved (Indicate 1-4 (0-25% - 76-100%) recovery objectives completed):** The October 2005 annual data call for banded dune snails rated the recovery achieved as a 2 (26 – 50%). This represents both taxonomic entities included in the listing rule (then as subspecies), with an average of 1 (0 – 26%) for Chorro shoulderband snail and 3 (50 - 75%) for Morro shoulderband snail. The low rating for Chorro shoulderband snail was due to a lack of information at the time, rather than a problem with recovery for the species.

### 4. Listing history

#### Original Listing

FR notice: 59 FR 64613

Date listed: December 15, 1994

Entity listed (*species, subspecies, DPS*): *Helminthoglypta walkeriana* (= *H. w. walkeriana* and *H. w. morroensis*)

Classification (*threatened or endangered*): Endangered

5. **Associated actions:** Critical habitat was proposed for the banded dune snail on July 12, 2000 (65 FR 42962) and designated on February 7, 2001 (66 FR 9233).

**6. Review History:** This is the first in-depth status review that has been conducted for this species since its listing in 1994. The proposed and final critical habitat rules and the draft and final recovery plans did include minor status reviews; however, a thorough analysis of the species' status was not conducted for these publications.

**7. Species' Recovery Priority Number at start of review:** The recovery priority number for the banded dune snail is currently 8C. The "8" indicates that there is a moderate degree of threat and that the organism is listed at the species level. The "C" indicates that there may be conflict, in this case due to an increasing amount of residential development.

## **8. Recovery Plan or Outline**

**Name of plan:** Recovery Plan for the Morro Shoulderband Snail and Four Plants from Western San Luis Obispo County, California.

**Date issued:** September 26, 1998.

**Dates of previous revisions:** There have been no revisions to this plan.

**Indicate if plan is being used (Please explain to what extent and why):** The recovery plan is being followed in that many of the recovery criteria and objectives either have been met or the activities are in the process of being conducted. All of the criteria for downlisting to threatened have been met for the Morro shoulderband snail. It is also being used as part of the impact analyses conducted pursuant to sections 7 and 10 of the Act. It is being used to guide mitigation and conservation efforts associated with sections 6 and 10 of the Act. Therefore, the recovery plan has been (and continues to be) useful as a guide for the recovery of this animal.

## **II. REVIEW ANALYSIS**

### **A. Application of the 1996 Distinct Population Segment (DPS) policy**

#### **1. Is the species under review listed as a DPS?**

No. The Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate wildlife. This definition limits listing as DPS to only vertebrate species of fish and wildlife. Because the species under review is a mollusk and the DPS policy is not applicable, the application of the DPS policy to the species listing is not addressed further in this review.

## B. Recovery Criteria

1. **Does the species have a final, approved recovery plan?**

Yes.

2. **Does the recovery plan contain recovery (i.e., downlisting or delisting) criteria?**

Yes.

3. **Adequacy of recovery criteria.**

a. **Do the recovery criteria reflect the best available (i.e., most up-to-date) information on the biology of the species and its habitat?**

No. The final recovery plan was published in 1998. Since that time, the taxonomic status of the snail (which included two subspecies at the time of listing) has been revised based on a recent taxonomic review (Roth and Tupen 2004). As a result, the subspecies that were listed have been elevated to the species level. Many of the recovery actions have been partially to fully completed for the coastal taxon, the Morro shoulderband snail.

b. **Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria (and there is no new information to consider regarding existing or new threats)?**

Not all five of the listing factors are addressed in the recovery criteria for the banded dune snail. Factors A, C, and E are addressed with no new threats known at this time; however, factor B is not addressed and factor D is only indirectly addressed. We also have additional information regarding the degree of those threats in the listing package (refer to II. B. 4).

4. **List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information. For threats-related recovery criteria, please note which of the 5 listing factors\* are addressed by that criterion. If any of the 5-listing factors are not relevant to this species, please note that here.**

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\*A) Present or threatened destruction, modification or curtailment of its habitat or range;  
B) Overutilization for commercial, recreational, scientific, or educational purposes;  
C) Disease or predation;  
D) Inadequacy of existing regulatory mechanisms;  
E) Other natural or manmade factors affecting its continued existence.

The recovery criteria and tasks in the *Recovery Plan for the Morro shoulderband snail and four plants from western San Luis Obispo County, California* (USFWS 1998) were only developed for the Morro shoulderband snail, since the Chorro shoulderband snail was thought to be extinct at the time. Therefore, the following criteria are only relevant for the Morro shoulderband snail. The discussion of the recovery criteria is limited to recovery efforts for the Morro shoulderband snail as currently described.

Although the recovery criteria in this plan were not explicitly based on threats, some of the criteria do address particular threats that were specifically identified in the listing rule. Also, many of the recovery tasks in this plan address threats identified in the listing rule.

Downlisting Criteria from the Recovery Plan. “Downlisting for the Morro shoulderband snail can be considered when [1.] sufficient populations and suitable habitats from all four Conservation Planning Areas (Morro Spit, West Pecho, South Los Osos, and Northeast Los Osos) are secured and protected. These areas should be intact and relatively unfragmented by urban development. Snail populations must be large enough to minimize the short-term (next 50 years) risk of extinction on any of the four Conservation Planning Areas, based on results of tasks 3.2.1.1, 3.2.1.2, and 3.2.1.3 and on at least preliminary results from task 4.1. Downlisting also requires that [2.] potential habitat within the snail’s historic range will have been identified and surveyed to see if undiscovered populations exist. Should surveys locate additional populations, especially north of Morro Bay, [3.] recovery criteria will have to be evaluated and revised.”

The first criterion for downlisting the snail requires that intact and relatively unfragmented habitat blocks in each of the four conservation planning areas be secured and protected. The criterion indicates that snail populations in these four areas must be large enough to minimize the short-term (next 50 years) risk of extinction, including the risk due to competition (task 3.2.1.1) and parasitism (task 3.2.1.3). This criterion also indicates that our analysis of whether populations are large enough to minimize short-term extinction risk is also influenced by research on habitat use and the life history of the snail (task 3.2.1.2) and documentation of population dynamics to determine trends (i.e., demographics, task 4.1). This criterion specifically addresses threats described in the listing document under factors A, C, and E.

Habitat blocks have been secured and protected in each of the four Conservation Planning Areas (Morro Spit, West Pecho, South Los Osos, and Northeast Los Osos) identified in the recovery plan (USFWS Geographic Information Systems (GIS) data 2006; S. Kirkland, USFWS, pers. comm. 2005; V. Cicero, California Department of Parks and Recreation, pers. comm. 2005). These areas are sufficient to satisfy the criterion for downlisting. The habitat blocks are unfragmented by development and cover large areas of the

undeveloped habitat around the Los Osos area (Figure 1.). While habitat use and life history needs of the Morro shoulderband snail have not been studied extensively, snail experts have been able to increase our knowledge and understanding of these animals considerably through their field and laboratory observations since its listing (Reeves 2000; USFWS 2001; Walgren 2003a, 2003b; Roth and Tupen 2004). We have a better understanding of the variations in habitat that the Morro shoulderband snail can tolerate, the range of the species, and which habitats are more conducive to supporting snails (Walgren 2003a; J. Tupen, biological consultant, pers. comm. 2005; M. Walgren, California Department of Parks and Recreation, pers. comm. 2005b). Although we have not conducted extensive monitoring of population trends, we do have data from numerous surveys that have been conducted (Morro Group GIS data 2005; Roth and Tupen 2004). Additional individuals are being found every year and in a wider variety of habitat types. This could be due to an actual increase in numbers (due to better conservation efforts after the listing) or may simply reflect the fact that more people are now looking for this species in more places and observing more individuals of a stabilized population. These data indicate that the population is either stable or increasing.

The second criterion for downlisting requires that potential habitat within the snail's historic range will have been identified and surveyed to see if undiscovered populations exist. As previously mentioned, numerous surveys (Morro Group GIS data 2005; Roth and Tupen 2004; M. Walgren, pers. comm. 2005b; Walgren 2004a, 2004b) have reported and documented the Morro shoulderband snail in a wider range and distribution than thought at the time of listing, most notably in the North Los Osos area. This criterion does not specifically address any of the threats described in the listing document under factors A, B, C, D, or E.

The third criterion for downlisting requires that, if additional snail populations are located, especially north of Morro Bay, then recovery criteria will have to be evaluated and revised. Additional populations of the Morro shoulderband snail have been located in portions of the range: north of Morro Bay, southeast of Los Osos, west of Los Osos, and in the urban areas of Los Osos. We have evaluated the recovery criteria and are working on revising them. A great deal of the information has been collected over the 11 years since listing is relevant to a revision of the recovery criteria (Walgren 2004a, 2004b; Roth and Tupen 2004; Tupen and Roth 2005; Morro Group GIS data 2005; V. Cicero, pers. comm. 2005). This criterion does not specifically address any of the threats described in the listing document under factors A, B, C, D, or E. We have met the first two criteria and accomplished a portion of the third criterion for downlisting the Morro shoulderband snail. Based on this and a review of the threats to the species, we believe that completing the revisions to the recovery criteria are important for delisting the Morro shoulderband snail, but not necessary to downlist it.

Delisting Criteria from the Recovery Plan. “Delisting can be considered for [the Morro shoulderband snail] when [1.] habitats from all Conservation Planning Areas (and, if necessary, any newly located populations) are successfully managed to maintain the desired community structure and [2.] secured from threats of development, invasion of non-native plants, structural changes due to senescence of dune vegetation, recreational use, pesticides (including slug and snail baits), parasites, and competition or predation from non-native snail species.”

Portions of both of these delisting criteria have been completed. Some of the preserve areas have a management plan that addresses all of the above issues (e.g., Montana De Oro State Park (M. Walgren, pers. comm. 2006a)), but management plans still need to be developed for most of the habitat that has been preserved. Additional habitat in each of the Conservation Planning Areas still needs to be protected and have associated management plans developed. All of the issues regarding recreational use (e.g., off-highway vehicles (OHVs)) and parasites appear to have been addressed and are no longer a threat to the continued existence of the Morro shoulderband snail. OHV use is no longer occurring within its habitat. The sarcophagid fly that has been thought to be a potential parasite on banded dune snails has been identified to at least its class level and the majority of flies in that group are not parasitic. There has not been an increase in documentations of sarcophagid fly pupae in snail shell cases. Species experts have examined the competition issues between the brown garden snail (*Helix aspersa*) and the Morro shoulderband snail. There appears to be no evidence of competition between the two species for aestivation sites, harbor/shelter sites, or food (M. Walgren, pers. comm. 2005b; S. Kirkland, pers. comm. 2005) as was postulated in the listing rule. These two snails (Morro shoulderband snail and brown garden snail) use different sites for aestivation. Although there may be overlap in use of harbor/shelter sites, there is no shortage of these sites. The two species appear to have different food sources; the Morro shoulderband snail has mouth parts (radula) consistent with other snails that eat decaying material and micorrhizae and is thought to predominantly eat micorrhizae (but will eat live material when presented with it in the lab (Hill 1974; J. Tupen, pers. comm. 2005)), while the brown garden snail eats live vegetable material (Walgren 2003a). There are ample sources of each of these resources and are therefore not limiting factors (M. Walgren, pers. comm. 2005b). Therefore, the criteria for delisting have not been met. These criteria specifically address threats described in the listing document under factors A, C, and E.

## C. Updated Information and Current Species Status

### 1. Biology and Habitat

#### a. Abundance, population trends (e.g., increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:

Few demographic studies and/or population surveys (*per se*) have been conducted for either the Morro shoulderband snail or Chorro shoulderband snail. As such, we can not clearly determine densities or the population trend for either species. Regarding the Morro shoulderband snail, we do have data from numerous surveys that have been conducted (Reeves 2000, Morro Group GIS data 2005, Roth and Tupen 2004). More surveys are conducted every year, with more snails being found every year. This could indicate either that the snail numbers are increasing or simply that people are looking in more places and observing more individuals of a stabilized population. Because we cannot distinguish between these two possibilities, these data are not sufficient to determine the population trend. However, it may be reasonable to infer from these surveys that the snail population trend is at least either stable or increasing and not decreasing.

The Chorro shoulderband snail was thought to be extinct at the time of listing in 1994. Since the listing, live individuals and empty shells of this species have been documented from Cayucos south to the northern city limits of Morro Bay, inland to the City of San Luis Obispo, and southeast to the town of Edna (Walgren 2003; Roth and Tupen 2004; P. Waldburger, biological consultant, pers. comm. 2006). The surveys of which we are aware from 1999 through 2003 have been mostly presence/absence and relative abundance surveys that noted environmental conditions and occasionally potential threats. While this species is of limited distribution (as are many of the species in this genus), it was observed to be common to abundant at approximately 20 locations within this distribution between 2000 and 2002 (M. Walgren, pers comm. 2005a).

#### b. Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding):

No genetics studies have been conducted for either species. One study is pending that will examine the genetic variability between the Morro shoulderband snail and Chorro shoulderband snail (in litt. USFWS 2004). There are no plans at this time to use genetics experiments to analyze trends in genetic variation for either species.

**c. Taxonomic classification or changes in nomenclature:**

The taxonomic classification for the banded dune snail [*Helminthoglypta walkeriana* (Hemphill 1911)] had been revised/updated several times between its description in 1911 (Hemphill) and its being listed as endangered in 1994 (Field 1930; Pilsbry 1939; Roth 1973; Roth 1985; Roth and Sadeghian 2003; Walgren 2003a, 2003b). At the time of its listing, *H. walkeriana* included two subspecific entities *H. w. walkeriana* and *H. w. morroensis* [= *H. var. morroensis* (Hemphill 1911)]. Since the listing, several papers have examined the status of these two entities (Roth and Tupen 2004; Tupen and Roth 2005; Walgren 2003a, 2003b). Walgren (2004a) acknowledged that the taxonomic status of the banded dune snail remained “unsettled” and he recognized the two subspecies. Later that year Walgren (2004b) again consistently recognized both taxa as valid subspecies “...based on unique shell morphology, ecology, and geographically isolated ranges.” He also recommended that “...further research should focus on ... soft tissue anatomy and DNA to address the taxonomic status of [the] various types.” Roth and Tupen (2004) analyzed shell form variation and soft tissue (genitalia) of the two taxa. They determined that variations in shell shape, shell sculpture, and soft anatomy (genitalia) between the two taxa were consistent with reproductive isolation and that this was consistent with the biological species concept of Mayr (1940, 2000). Based on these data, they elevated both taxa to full species status resulting in the following combinations: *Helminthoglypta walkeriana* (Hemphill 1911) and *Helminthoglypta morroensis* (Hemphill 1911). *Helminthoglypta walkeriana* is the Morro shoulderband snail and *H. morroensis* was proposed to be called the Chorro shoulderband snail by Roth and Tupen (2004).

While there remain differences in opinion as to the precise taxonomic rank that should be assigned to these entities, there is a clear consensus that they are both valid biological entities of at least subspecies level. We believe that Roth and Tupen’s work of 2004 sufficiently justifies their conclusion and is consistent with the majority of species descriptions for other terrestrial snails (Gilbertson and Naranjo-Garcia 1998; Gilbertson 1993, 1989a, 1989b; Hemphill 1911; Pilsbry 1939; see Bequaert and Miller (1973) for additional references to other snail descriptions). Based on this, we consider both taxa to be full species.

**d. Spatial distribution, trends in spatial distribution (e.g., increasingly fragmented, increased numbers of corridors), or historic range (e.g., corrections to the historical range, change in distribution of the species’ within its historic range):**

At the time of listing, the known range of the banded dune snail was thought to be “...restricted to sandy soils of coastal dune and coastal sage scrub communities near Morro Bay.” It was also speculated that there could be as few as several hundred individuals remaining in the world, consisting of only the Morro shoulderband snail. The Chorro shoulderband snail was thought to be extinct (59 FR 61614).

At the present, the the Morro shoulderband snail is known from a slightly expanded range, but is still limited to the Los Osos/Morro Bay area. Based on Roth and Tupen (2004) its range is approximately 2 miles (3.2 kilometers (km)) farther to the south and east than known at the time of listing, and it is also now known to occupy a narrow strip of dune vegetation north of Morro Bay (Figure 2.). The known range now comprises approximately 7,700 acres (ac) (3,100 hectares (ha)).

At the present, the Chorro shoulderband snail is known to have a larger range than the Morro shoulderband snail. It is known to occur between Cayucos, which is 8 miles (13 km) north of Morro Bay along the coast, the City of San Luis Obispo, and southeast to the town of Edna in an area approximately 24 miles (38 km) long by 8 miles (13 km) wide, an area of approximately 136,800 ac (55,400 ha) (Figure 2.). Roth and Tupen (2004) documented approximately 40 locations for the Chorro shoulderband snail. M. Walgren (pers. comm. 2005a) reported that this snail was “abundant” at approximately 20 locations that he visited.

**e. Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):**

The Morro shoulderband snail is very much a coastal organism. Its primary habitat consists of coastal dune, coastal dune scrub, and maritime chaparral plant communities that are mostly in back dune and stabilized dune systems. They appear to be most abundant in early successional scrub communities, with many low-lying branches touching the ground. They have also been found in numerous suburban landscaped habitats, fields, and occasionally in areas with high concentrations of some non-native plants (e.g., *Carpobrotus edulis*). They are less common in areas dominated by most non-native, invasive exotic plants (e.g., *Ehrharta calycina*, *Brassica* spp.) (Walgren 2003a, 2003b; M. Walgren, pers. comm. 2005b); and according to M. Walgren (pers. comm. 2005c) they have never been reported or documented from *Eucalyptus* woodlands, possibly due to the reported allelopathic (suppression of growth due to the release of toxic substances) properties of the plant. We estimate that the current know range of the Morro shoulderband snail consists of approximately 7,700 ac (3,100 ha) (USFWS 2001, 2004).

While the Chorro shoulderband snail is found in a variety of scrub and grassland communities/habitats (some types of which are similar to those for the Morro shoulderband snail), it is most often found in grassland fields and rocky (outcrop) areas in grasslands and openings in scrub (coastal dune scrub, coastal sage scrub, and chaparral). There is a strong correlation between the Chorro shoulderband snail’s occurrence with clay and serpentine soils in these habitats (J. Tupen, pers. comm. 2005; Walgren 2003; M. Walgren, pers. comm. 2005a). For the most part it is an interior organism (occurring in areas beyond the effect of coastal influence), but it has been documented in verbena-beach bursage

vegetation directly adjacent to the Pacific Ocean at Cayucos (Walgren 2003). We estimate that the current known range of the Chorro shoulderband snail consists of approximately 136,800 ac (55,400 ha) (USFWS 2004).

**3. Five Factor Analysis (threats, conservation measures, and regulatory mechanisms)**

**a. Present or threatened destruction, modification or curtailment of its habitat or range:**

Under Factor A in the final listing document, we stated that threats to the banded dune snail's existence consisted of elimination of snails and their habitat by residential and other development and by degradation of habitat by off-road vehicle activity and maturation of the dune vegetation (USFWS 1994). Since the listing of the snail, the Service has developed a recovery plan (USFWS 1998) and designated critical habitat (USFWS 2001).

The threats identified in the final listing rule have diminished. Development in the Los Osos area is now analyzed for potential impacts to the snail. Habitat blocks have been secured and protected in each of the four Conservation Planning Areas (Morro Spit, West Pecho, South Los Osos, and Northeast Los Osos) (S. Kirkland, pers. comm. 2005; M. Walgren pers. comm. 2006a; USFWS GIS data layers 2006) as per the recovery plan (Figure 1.). The habitat blocks are unfragmented by development and cover large areas of the undeveloped habitat around the Los Osos area. The conservation of these preserve areas satisfy the criterion for downlisting.

Adverse effects to the Morro shoulderband snail from OHV use in the Los Osos area do not occur any more. The California Department of Parks and Recreation put up signs and barriers that have since eliminated this threat. There have been no reports or observations of OHV use in the snail's habitat since the California Department of Parks and Recreation put up signs and barriers (M. Walgren, pers. comm. 2005b).

While the degradation of habitat through maturation is still an issue/threat to the snail's long-term survival, it does not seem to be as immediate of a threat as was once thought. Snails are found in marginal (edge and slightly disturbed) habitats indicating that they can survive in the short-term, but a long-term solution is still needed. State Parks owns Morro shoulderband snail habitat south of Los Osos, which is considered to be maturing (Morro Strand State Beach, Los Osos Oaks State Reserve, Morro Bay State Park, and Montana de Oro State Park) (M. Walgren, pers. comm. 2006a). There is a similar concern for the habitat in the Elfin Forest reserve area, which is jointly owned by the County of San Luis Obispo and State Parks and is managed by the County of San Luis Obispo and a local conservation group (Small Wilderness Area Preservation).

In summary, threats to the survival of the Morro shoulderband snail through habitat loss and degradation have been reduced considerably. The Service hopes to expand habitat maintenance into other areas essential for the snail using habitat conservation plans and additional regulatory mechanisms as applicable. Development is occurring in a planned fashion in areas that are less important for the survival of the snail. We developed a preserve design for the Morro shoulderband snail that should allow it to recover to the point that it no longer requires protection under the Act. Much of this preserve area is already protected. Therefore, many of the threats to the snail under Factor A have been partially controlled and, in some cases, eliminated; however, many of the management activities still need to be accomplished for this species to be considered for delisting (i.e., management implementation, vegetation maturation management).

Since the Chorro shoulderband snail was thought to be extinct at the time of listing, we did not list any threats to it under Factor A in the final listing document (USFWS 1994). Live specimens of Chorro shoulderband snail have been recently documented a number of locations over an area of approximately 136, 800, and at some of those locations, the snail is abundant (refer to Section C.1.e). While some loss of habitat to urban sprawl and conversion of cattle ranching to vineyards is occurring, these impacts appear to be occurring in a only small portion of the species range. (M. Walgren, pers. comm. 2006a; J. Tupen, pers. comm. 2005; S. Kirkland, pers. comm. 2005). It should also be noted that there is a high correlation between the occurrence of the Chorro shoulderband snail and certain uncommon soil and habitat associations; most particularly, it is associated with serpentine and clay soils (Roth and Tupen 2004).

**b. Overutilization for commercial, recreational, scientific, or educational purposes:**

Under Factor B in the final listing document, we stated that there were threats to the Morro shoulderband snail's existence which made it highly vulnerable to recreational or scientific collectors due to its extremely limited range and numbers and its taxonomic distinctness (USFWS 1994). Since that time, more snails and shells are found every year and in a wider distribution (Morro Group GIS data 2005; Roth and Tupen 2004; Walgren 2003a; California Department of Fish and Game 2005). The scientific and public communities are aware that over-collection is an issue that threatens the snail. Since the listing, there is only one known report that shells have been collected without a permit (S. Kirkland, pers. comm. 2005; Nanson 1998). Therefore, the collection of snails and/or shells no longer appears to be a threat to the survival of the species.

We did not list any threats to the Chorro shoulderband snail under Factor B in the final listing document (USFWS 1994). We are not aware of any current

threats under this factor (Tupen and Roth 2005; M. Walgren, pers. comm. 2006a; J. Tupen pers. comm. 2005).

**c. Disease or predation:**

We determined that under Factor C in the final listing document there were potential threats to the Morro shoulderband snail's existence from parasitoid infestation from sarcophagid fly pupae and predation by rodents (USFWS 1994). Since the listing, there has been an increase in snail observations, but there has not been a corresponding increase in sarcophagid fly pupae infestations of snails. Hogue (1993) indicates that fly larvae in the sarcophagid fly family (Sarcophagidae) "...live in fish and animal carcasses and other decomposing organic matter, particularly discarded meat...and they frequently infest the remains of poisoned garden snails." According to M. Walgren (pers. comm. 2006b), there are a few species in this family that have been documented to eat live material. While there have been no specific studies on the potential threats to the snail from these sarcophagid flies, there may be no threat since the majority of flies in this family do not eat live organisms. There have been no further reports or documentations of predation on the snails from rodents or any other animals. Therefore, based on new information, predation does not appear to be a threat at this time. There may be a threat to snails found in urban areas in Los Osos due to poisoning of garden snails, but there have been no studies to indicate whether this is occurring. This should be investigated.

We did not list any threats to the Chorro shoulderband snail under Factor C in the final listing document (USFWS 1994). We are not aware of any current threats under this factor at this time (Tupen and Roth 2005; M. Walgren, pers. comm. 2006a; J. Tupen, pers. comm. 2005).

**d. Inadequacy of existing regulatory mechanisms:**

We determined that under Factor D in the final listing document there were potential threats to the Morro shoulderband snail existence because it was not specifically protected under any State or local laws (USFWS 1994). State Park policy for Montana de Oro State Park, however, calls for management programs to be prepared and implemented to perpetuate this and other taxa of special concern. Collection of this species is prohibited on State Park land except by permit. This protection applies only to individuals, and does not prevent the effects of indirect human disturbance such as recreational activities from harming this species and its habitat. However, State Parks has reduced and/or eliminated adverse effects due to human activities on its property in the Los Osos area (M. Walgren, pers. comm. 2005b). The County of San Luis Obispo is aware of the snail and its endangered status. They regulate/review project proposals in the Los Osos area for potential impacts to the snail and coordinate with the Service when snails are present on any site (S. Kirkland pers. comm. 2005; J. Eliason, County of San Luis Obispo, pers. comm. 2006). Additionally, proposed development

projects in this area must address potential impacts to the snail under the California Environmental Quality Act. These regulatory mechanisms will remain in place regardless of whether the snail is listed as endangered or threatened. Therefore, there are additional regulatory mechanisms that are now in place to help conserve this species, and we do not believe that this is a continued threat at this time.

We did not list any threats to the Chorro shoulderband snail under Factor D in the final listing document (USFWS 1994). Currently, no local or state laws or regulatory mechanisms specifically afford protection to the Chorro shoulderband snail (J. Eliason, pers. comm. 2006), but we do not consider this to be a threat for this species at this time (M. Walgren, pers. comm. 2006a; M. Walgren, pers. comm. 2006b; J. Tupen, pers. comm. 2005).

**e. Other natural or manmade factors affecting its continued existence:**

We determined that under Factor E in the final listing document there were potential threats to the Morro shoulderband snail's existence because: 1) it might be experiencing competition from the brown garden snail for food, aestivation sites, and harboring sites; 2) individuals had been killed as a result of controlled burning practices; 3) drought and/or heat conditions; and 4) stochastic (i.e., random) extirpation/extinction events due to the small size and isolation of the remaining populations (USFWS 1994).

Species experts have examined the competition issues between the brown garden snail and Morro shoulderband snail. As discussed above in Section II.B.4., there appears to be no evidence of competition between the two species for aestivation sites, harbor/shelter sites, or food (M. Walgren, pers. comm. 2005b; S. Kirkland, pers. comm. 2005). Morro shoulderband snails use different sites for aestivation (than the brown garden snail). There may be overlap in use of harbor/shelter sites; however, there appears to be no shortage of these. The two species appear to have different food sources. The Morro shoulderband snail has mouth parts (radula) consistent with other snails that eat decaying material and micorrhizae and is thought to eat micorrhizae (Hill 1974; J. Tupen, pers. comm. 2005), while the brown garden snail eats live vegetable material (Walgren 2003a). However, Morro shoulderband snails will eat live plant material when presented with it in the lab (Walgren 2003a). There are ample sources of each of the above mentioned resources and therefore, these do not appear to be limiting factors or threats to the Morro shoulderband snail (M. Walgren, pers. comm. 2005b).

At least several Morro shoulderband snails were killed as a result of controlled burning of coastal scrub that was carried out to improve habitat for the endangered Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*) within Montana de Oro State Park (USFWS 1994). Based on this event, California Department of Parks and Recreation conducts snail surveys prior to conducting any controlled burns in the Morro Bay area (M. Walgren, pers. comm. 2005b).

Roth (1985) suggested that the Morro shoulderband snail's viability may have been lowered by drought and/or heat conditions. We have no additional information bearing on this threat.

The Morro shoulderband snail is also threatened with stochastic (i.e., random) extinction due to the small size and isolation of the remaining populations. The limited gene pool may depress reproductive vigor, or a single human-caused or natural environmental disturbance (e.g., wildfire) could extirpate a significant percentage of the individuals of this species. Increasing development surrounding the State Parks will likely increase threats from stochastic events. Additionally, more exotic animals and plants will likely invade into the preserve areas as a result of increasing development. These factors may not be enough to threaten the survival of the snail independently, but taking into account the limited range, the cumulative effect of all of these combined could threaten the survival and recovery of the Morro shoulderband snail.

We did not list any threats to the Chorro shoulderband snail under Factor E in the final listing document (USFWS 1994) and we are not aware of any current threats under this factor at this time (Tupen and Roth 2005; M. Walgren, pers. comm. 2006a; J. Tupen, pers. comm. 2005). This species is more widely distributed with more contiguous habitat than the Morro shoulderband snail, therefore, it is less likely to be susceptible to stochastic events.

#### D. Synthesis

Morro shoulderband snail populations are stable to increasing. Additional individuals of the species in the Los Osos area are being found every year and in a wider variety of habitat types. Critical habitat was designated for this species in 2001. Additional areas within the designated critical habitat are being preserved every year through land acquisition or conservation easements. Some potential threats to the snail (e.g., competition and parasitism) have been eliminated or shown not to be occurring. Many threats to the Morro shoulderband snail have been reduced or eliminated to the point that it meets recovery criteria for downlisting to threatened status; however, some threats still exist and it does not meet the recovery criteria for delisting. **The two largest remaining threats to the snail are development and a lack of habitat management.** Development continues to threaten habitat in designated critical habitat (USFWS 2001) and Conservation Planning Areas (USFWS 1998). **Management plans need to be developed and implemented for the preserved lands (for invasive vegetation, habitat maturation, etc.)**

Downlisting this species would enable us to develop a section 4(d) rule under the Act that could help conserve and manage the rest of the preserve areas for this species which would then allow us to meet the delisting criteria. A number of recovery tasks still need to be accomplished before delisting can occur;

specifically, additional habitat should be preserved within its range, better management plans need to be developed for the preserved habitat, and on the ground management activities need to be increased (the majority of the preserved habitat is not managed at the level required for downlisting).

The largest outstanding issue regarding the banded dune snail at this time is its taxonomic ranking. At the time of its listing, *Helminthoglypta walkeriana* included two subspecific entities: *H. w. walkeriana* and *H. w. morroensis* [= *H. var. morroensis* (Hemphill 1911)]. *Helminthoglypta walkeriana walkeriana* was considered endangered and *H. w. morroensis* was considered to be extinct (Roth and Tupen 2004; USFWS 1994). Since the listing, several papers have examined the status of these two entities (Tupen and Roth 2005; Roth and Tupen 2004; Walgren 2003a, 2003b). While there remain differences of opinion as to the precise taxonomic rank that should be assigned to these entities, there is a clear consensus that they are both valid biological entities of at least subspecies level. We believe that Roth and Tupen's work (2004) sufficiently justifies their conclusion that both taxa are full species, *H. walkeriana* and *H. morroensis*.

As noted above, *Helminthoglypta morroensis* has been rediscovered and although still limited in distribution, the range of this species is much greater than that of *H. walkeriana*. It has also been characterized as being abundant in several locations. The main threat to this species is from urban growth and the potential conversion of rangeland to vineyards. However, the loss of its habitat due to these activities is limited and does not appear to threaten the continued existence of this species at this time. Therefore, we believe this species does not appear to warrant listing under the Act.

### III. RESULTS

#### A. Recommended Classification:

We recommend downlisting the Morro shoulderband snail from endangered to threatened. We have a recovery plan that has helped guide recovery efforts, the recovery criteria in the recovery plan have been met for downlisting (but not delisting), and some threats under the five-factor analysis have either been eliminated, diminished, discounted, or are being addressed enough so that we believe that this species is stable to increasing. In addition, we believe that downlisting the Morro shoulderband snail and developing an incentive-based section 4(d) rule under the Act will help move this species to the final stages of recovery to the point where listing (and protections) under the Act are no longer necessary.

We recommend delisting the Chorro shoulderband snail. The final listing rule, critical habitat, and recovery plan did not address this species as it was thought to be extinct at the time. However, the Morro shoulderband final listing rule was done at the species level, which resulted in both of what was then thought to be subspecies being listed as endangered. Chorro shoulderband snail was never intended to be listed and so

this listing was done in error. Further, upon its rediscovery over a wide range with limited threats, it is no longer appropriate for it to be listed as endangered.

**B. New Recovery Priority Number 8**

Morro shoulderband snail remains listed at the full species level since it was elevated by Roth and Tupen (2004). The threats to it remain at moderate; however, progress has been made in limiting and eliminating those threats. The local community now has a much better understanding the status of this snail. With this understanding, the effects of protections under the Act are much less controversial; therefore the suffix "C" is no longer needed for this species.

**C. If applicable, indicate the Listing and Reclassification Priority Number (FWS only):**

**Reclassification (from Endangered to Threatened) Priority Number: 2**  
(for the Morro shoulderband snail)

**Delisting (Removal from list regardless of current classification) Priority Number: 2 (for the Chorro shoulderband snail)**

There is currently a high degree of management impact for the Morro shoulderband snail. There are currently numerous small project proposals (e.g., single-family housing proposals) that lack a federal nexus and can not be processed through section 10 of the Act. This is due to the lack of adequate mitigation opportunities to offset adverse effects to the snail. Therefore, there are currently a high degree of impacts on human activities that can be avoided through the regulatory process (particularly through downlisting to threatened and enacting a section 4(d) rule under the Act) without adversely affecting the recovery of the species. The downlisting of the Morro shoulderband snail would be an unpetitioned action and warrants a reclassification priority number of two (2). Downlisting the Morro shoulderband snail to threatened would provide an avenue for permitting small, low effect projects while maintaining the necessary protections to ensure its recovery.

We recommend that the Chorro shoulderband snail be delisted. Because of the change in shoulderband snail taxonomy and the error in listing the Chorro shoulderband snail as well as the resulting confusion of project proponents and the public, we feel that the management impact of the current designation is high. A high management impact for an unpetitioned action indicates that the delisting priority number is two (2).

**IV. RECOMMENDATIONS FOR FUTURE ACTIONS**

Along with the preparation of a rule to downlist the Morro shoulderband snail, develop a section 4(d) rule under the Act that encourages and facilitates the development of a regional (community-wide) plan for the snail (and other listed dune scrub species) while still allowing certain activities (e.g., the building of single family houses on vacant lots in urban areas that are away from the preserves and/or critical habitat) that may result in take of individuals that are not essential to the survival and recovery of the species.

Revise the recovery plan and recovery criteria to eliminate those threats that have been shown to not exist and concentrate future efforts where needed.

Work with others to conserve lands and habitat that are important for the Morro shoulderband snail, including lands in all four of the conservation planning areas, "other habitats," and the "potential restoration corridor" as identified in the recovery plan (see Figure 1 of this review and pp. 36-37, Figure 8 on p. 39, and pp. 43-44 in recovery plan).

As per the recovery plan (see pp. 46-49), work with others to manage the lands that serve as preserves for the Morro shoulderband snail (e.g., "Powell Parcel," "Butte Drive," "Hotel Site"). Many lands are conserved for the Morro shoulderband snail, but very few of these conserved lands are managed for the Morro shoulderband snail.

## V. REFERENCES

- Bequaert, J. C. and W. B. Miller. 1973. The mollusks of the arid southwest. The University of Arizona Press. Tuscon, Arizona.
- California Department of Fish and Game. 2005. Rarefind. California Natural Diversity Database. Electronic Version 3.0.5.
- Cicero, V. 2005. Personal communication. Status of the snail and questions regarding the five-factor analysis for both *Helminthoglypta walkeriana* and *H. morroensis*. Dated October 31, 2005. Biologist California Department of Parks and Recreation, San Luis Obispo District. Morro Bay, California.
- Eliason, J. 2006. Personal communication. Status of the reviews of projects in San Luis Obispo County that may have *Helminthoglypta walkeriana* or *H. morroensis*. Dated January 25, 2006. Analyst. County of San Luis Obispo, California.
- Field, S. C. 1930. Snails climbing trees. *Nautilus*. 44:30.
- Gilbertson, L. H. 1989a. A new species of *Holospira* (Gastropoda: Pulmonata) from Sonora, with the reproductive anatomy of *Holospira minima*. *The Veliger*. 32(1):91-94.
- Gilbertson, L. H. 1989b. A new species of *Holospira* (Gastropoda: Pulmonata) from Arizona, with the reproductive anatomies of *H. arizonensis* and *H. chiricahuana*. *The Veliger*. 32(3):308-312.
- Gilbertson, L. H. 1993. Reproductive anatomies of *Holospira* spp. (Gastropoda: Pulmonata: Urocoptidae) from Arizona and Sonora with a new subgenus and a new subspecies. *American Malacological Bulletin*. 10(1):71-81.
- Gilbertson, L. H. and E. Naranjo-Garcia. 1998. A new subgenus and a new species of *Holospira* (Gastropoda: Pulmonata: Urocoptidae) Sonora, Mexico. *The Veliger*. 41(4):314-318.
- Hemphill, H. 1911. Descriptions of some varieties of shells, with short notes on the geographical range and means of distribution of land shells. Trans. *San Diego Society of Natural History*. 1: 99-108.
- Hill, D. L. 1974. *Helminthoglypta walkeriana*: A rare and endangered land mollusk. California Polytechnic State University, San Luis Obispo. Unpublished senior thesis.

- Hogue, C. L. 1993. *Insects of the Los Angeles Basin*. Natural History Museum of Los Angeles County. Los Angeles, California.
- Kirkland, S. 2005. Personal communication. Status of the snail and the five-factor analysis for both *Helminthoglypta walkeriana* and *H. morroensis*. Dated September 19, 2005. Biologist. U.S. Fish and Wildlife Service, Ventura, California.
- Mayr, E. 1940. Speciation phenomena in birds. *American Naturalist*. 74:249-278.
- Mayr, E. 2000. The biological species concept. In: Wheeler, Q. D. & R. Meier (Eds.) *Species concepts and phylogenetic theory: a debate*. Columbia University Press. New York.
- Morro Group. 2005. GIS data regarding Morro shoulderband snail locations.
- Nanson, T. P. 1998. Letter to U.S. Fish and Wildlife Service Law Enforcement. Dated February 2, 1998.
- Pilsbry, H. E. 1939. Land mollusca of North America (north of Mexico). *Academy of Natural Sciences of Philadelphia Monograph* 3. 1(1), i-xvii, 1-573, i-ix.
- Reeves, E. 2000. Habitat and distribution of the Morro shoulderband snail, *Helminthoglypta walkeriana*. Unpublished California Department of Parks and Recreation standard agreement #C9749001.
- Roth, B. 1973. The systematic position of *Helminthoglypta traskii fieldi* Pilsbry, 1930 (Gastropoda: Stylommatophora). *Bulletin of the Southern California Academy of Sciences*. 72(3): 148-155.
- Roth, B. 1985. Status survey of the banded dune snail, (*Helminthoglypta walkeriana*). Unpublished report prepared for the U.S. Fish and Wildlife Service, Sacramento, California. San Francisco, California.
- Roth, B. and P. S. Sadeghian. 2003. Checklist of the land snails and slugs of California. *Santa Barbara Museum of Natural History Contributions in Science*. 3:1-81
- Roth, Barry and Jeff Tupen. 2004. Revision of the systematic status of *Helminthoglypta walkeriana morroensis* (Hemphill, 1911) (Gastropoda: Pulmonata). *Zootaxa* 616:1-23.

- Tupen, J. 2005. Personal communication. Status, threats, and information on *Helminthoglypta walkeriana* and *H. morroensis*. Dated October 6, 2005. Biological consultant. Sacramento, California.
- Tupen, J. and B. Roth. 2005. New study confirms restricted status of endangered California land snail. *Tentacle*. 13:9-10.
- U.S. Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Final Rule for Five Plants and Morro Shoulderband Snail from Western San Luis Obispo County, California. FR 59:64613.
- U.S. Fish and Wildlife Service. 1998. Recovery plan for the Morro shoulderband snail and four plants from western San Luis Obispo County, California. U.S. Fish and Wildlife Service, Portland, Oregon.
- U.S. Fish and Wildlife Service. 2000. Endangered and Threatened Wildlife and Plants; Proposed Designation of Critical Habitat for the Morro Shoulderband Snail. FR 65:42962.
- U.S. Fish and Wildlife Service. 2001. Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for the Morro Shoulderband Snail (*Helminthoglypta walkeriana*). FR 66:9233.
- U.S. Fish and Wildlife Service. 2004. A population genetics survey of Morro shoulderband snail. s6 grant.
- U.S. Fish and Wildlife Service. 2006. Geographic Information Systems data regarding physical, geographical, and distributional information in San Luis Obispo County for the Morro shoulderband snail and the Chorro shoulderband snail .
- Waldburger, P. 2006. Personal communication. Observation of *Helminthoglypta morroensis* shells in town of Edna. Biological consultant. California.
- Walgren, M. 2003a. The current status of the Morro shoulderband snail (*Helminthoglypta walkeriana*). California Polytechnic State University, San Luis Obispo. Unpublished thesis.
- Walgren, M. 2003b. Distribution and morphotypes of the federally endangered land snail *Helminthoglypta (Charodotes) walkeriana* (Hemphill, 1911). *Bulletin, Southern California Academy of Sciences*. 102(2). Morro Bay, California.

- Walgren, M. 2005a. Personal communication. Status of *Helminthoglypta morroensis*. Dated September 14, 2005. Biologist California Department of Parks and Recreation. Morro Bay, California.
- Walgren, M. 2005b. Personal communication. Status of the snail and questions regarding the five-factor analysis for both *Helminthoglypta walkeriana* and *H. morroensis*. Dated October 11, 2005. Biologist California Department of Parks and Recreation. Morro Bay, California.
- Walgren, M. 2005c. Personal communication. Status of *Helminthoglypta walkeriana* and *Eucalyptus*. Dated October 11, 2005. Biologist California Department of Parks and Recreation. Morro Bay, California.
- Walgren, M. 2006a. Personal communication. Status of the snail, State Park management plans, preserved areas that are occupied by snails, threats to *Helminthoglypta walkeriana* and *H. morroensis*. Dated January 18, 2006. Biologist California Department of Parks and Recreation. Morro Bay, California.
- Walgren, M. 2006b. Personal communication. Regarding sarcophagid flies. Dated January 23, 2006. Biologist California Department of Parks and Recreation. Morro Bay, California.

U.S. FISH AND WILDLIFE SERVICE  
5-YEAR REVIEW

Banded dune snail (*Helminthoglypta walkeriana*)

[=Morro shoulderband snail (*H. walkeriana*) and Chorro shoulderband snail (*H. morroensis*)]

Current Classification Endangered

Recommendation resulting from the 5-Year Review

Downlist Morro shoulderband snail (*Helminthoglypta walkeriana*) to  
Threatened

Delist Chorro shoulderband snail (*Helminthoglypta morroensis*)

Appropriate Listing/Reclassification Priority Number 2 (downlist) and 2 (delist)

Review Conducted By Mark A. Elvin

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

Approve Diane K. Nels Date 8/16/06

REGIONAL OFFICE APPROVAL:

Acting

Lead Regional Director, Fish and Wildlife Service

Approve Paul Denver Date 9/11/06

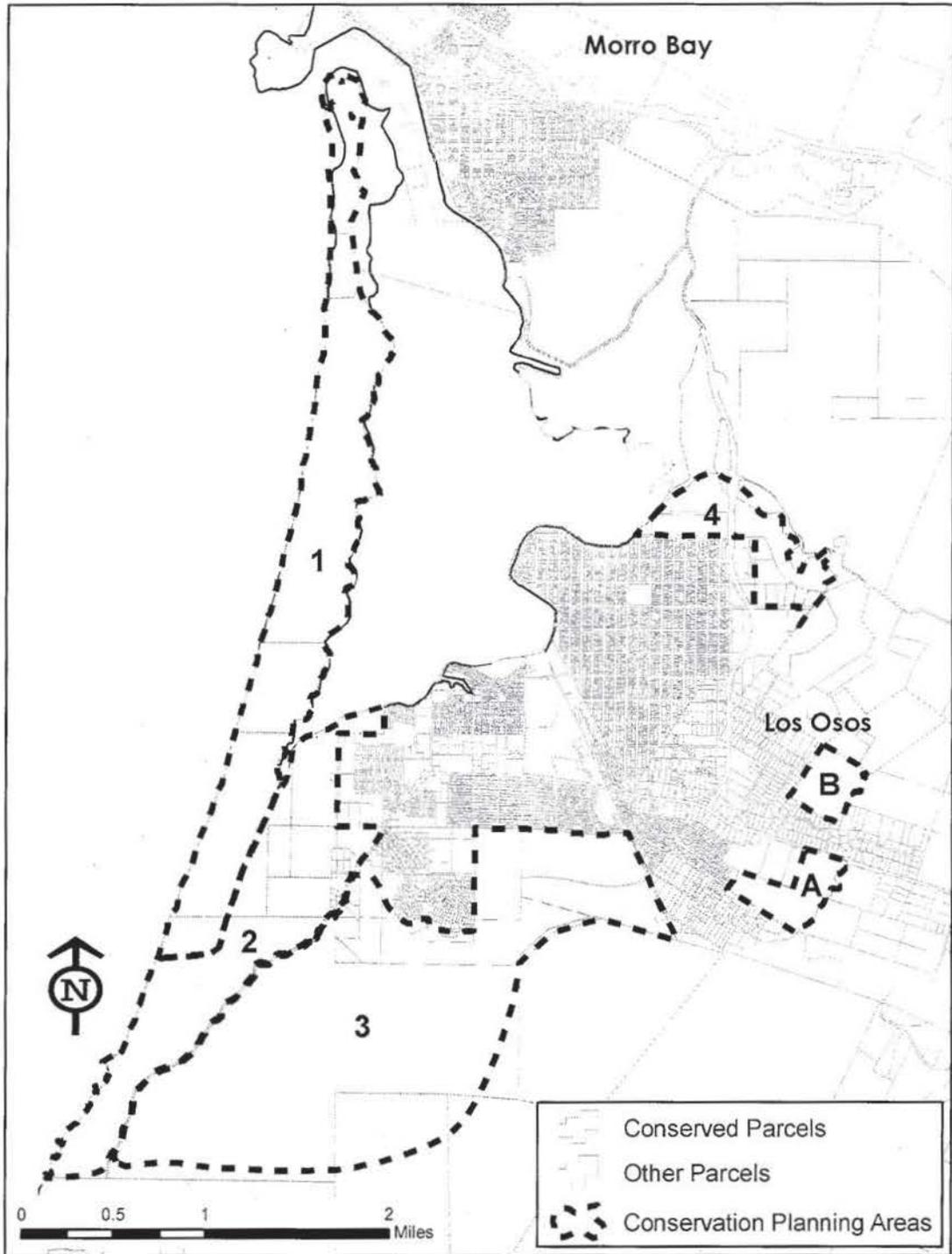


Figure 1. *Helmithoglypta walkeriana* conserved habitat blocks

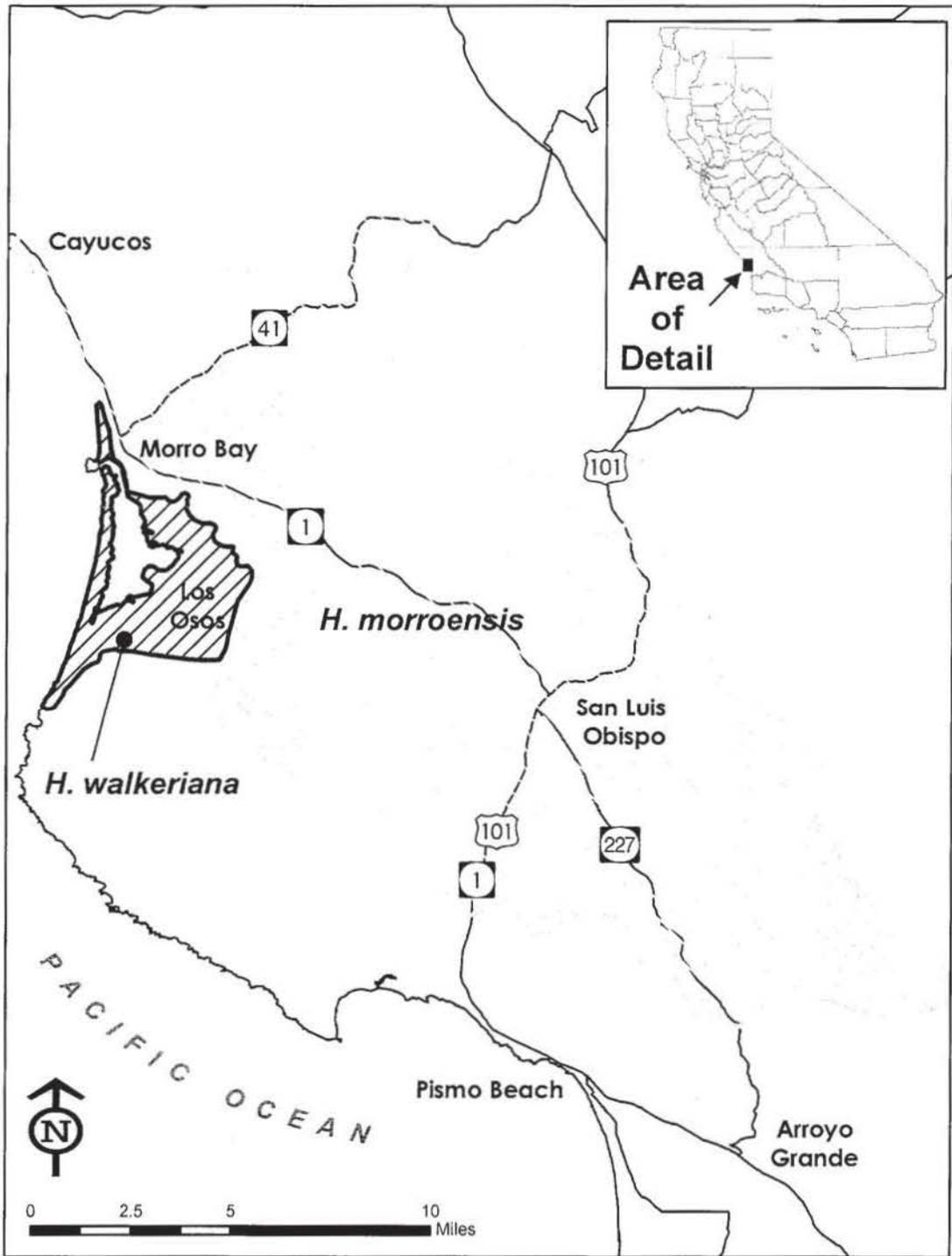


Figure 2. Expected ranges of *Helmithoglypta walkeriana* and *Helmithoglypta morroensis*