United States Department of the Interior
Fish and Wildlife Service
Ecological Services
Carlsbad Fish and Wildlife Office
2730 Loker Avenue, West
Carlsbad, California 92008

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FEB 26 2002
SAN DIEGO COUNTY
DEPT. OF PLANNING & LAND USE

February 21, 2002

Dear Interested Party,

Subject: Quino Checkerspot Butterfly 2002 Survey Recommendations

We are fast approaching the time of year when the federally endangered Quino checkerspot butterfly (*Euphydryas editha quino*) typically begins its flight season. The purpose of this letter is to inform you that we are distributing updated survey recommendations for 2002. Over the past two seasons, we have acquired new information regarding the biology and distribution of the Quino checkerspot butterfly. As a result, we made minor revisions to the year 2000 survey protocol and survey area map (enclosure).

We are also providing interested parties and recovery permit holders with information on habitat conditions and butterfly observations at each of our reference sites, in order to help them determine which monitored reference sites are most representative of their survey sites. Due to the unusually dry and warm weather in southern California during January and February 2002, habitat conditions at most monitored reference sites do not appear to be suitable for larval development. Therefore, we currently do not have any predictions of when or if Quino checkerspot butterflies will fly at most sites this season. We have established a telephone number for interested parties to call for the latest information on Quino checkerspot butterfly reference sites. The telephone number is 760-602-4283.

If you have any questions regarding the Quino checkerspot butterfly survey protocol, please contact Alison Anderson of my staff at 760-602-4287.

Sincerely,

Andrew R. Yuen

Jim A. Bartel
Acting Field Supervisor

Enclosure

Quino Checkerspot Butterfly
(*Euphydryas editha quino*)

SURVEY PROTOCOL INFORMATION

February 2002

U.S. Fish and Wildlife Service
2730 Loker Avenue West
Carlsbad, CA 92008

SUMMARY

The Quino checkerspot butterfly (*Euphydryas editha quino*, Quino) was listed as an endangered species on January 16, 1997 (62 FR 2313), and is protected under the provisions of the Endangered Species Act of 1973, as amended (Act). This survey protocol provides recommended guidance on survey methodology and outlines additional reporting terms and conditions (absent amended terms and conditions) for biologists possessing a current recovery permit for the Quino checkerspot pursuant to section 10(a)(1)(A) of the Act.

We recommend site assessments be conducted for all project sites within the recommended survey areas (see recommended Quino Checkerspot Survey Area Map). Site assessments determine if the project site contains areas where butterfly surveys are recommended. If a site is comprised solely of excluded areas, weekly butterfly surveys are not recommended.

The following items summarize the recommended Quino checkerspot survey protocol:

- The site assessment should be conducted prior to the first butterfly survey.
- Butterfly surveys should be conducted weekly for a minimum of 5 weeks during the flight season for non-excluded portions of the site.
- The timing of the butterfly flight season will be monitored and reported by the U.S. Fish and Wildlife Service (Service) for a number of occupied reference sites throughout the Quino checkerspot's range to assist biologists in determining when to initiate surveys. The flight season generally begins in late February to early March.
- Live capture and transport of an individual Quino checkerspot under very limited circumstances for identification and documentation purposes is authorized by recovery permits under section 10(a)(1)(A).

INTRODUCTION

To minimize take of the Quino checkerspot during surveys and provide a credible "presence-absence" methodology, we recommend that site assessments be conducted for project sites that occur, in whole or in part, within the recommended survey areas (see recommended Quino checkerspot Survey Area Map), and that butterfly surveys be conducted as indicated by such site assessments. Because adult Quino checkerspot surveys may result in take, such surveys should only be conducted by a biologist possessing a current recovery permit for the Quino checkerspot pursuant to section 10(a)(1)(A) of the Act (permitted biologist). Generally, a recovery permit for the Quino checkerspot authorizes the pursuit of butterflies for identification and photography, and under limited circumstances (described below), live capture and transport of a larva or butterfly for identification purposes.

We continue to work with local, State, and Federal biologists; scientific and academic institutions; commercial organizations; and other interested parties to collect additional data on the distribution, ecology, and biology of the Quino checkerspot. We will revise this survey protocol as needed, using the best available data. This survey protocol supersedes all previously recommended Quino checkerspot protocols.

Survey reports should be sent to Field Supervisor, Carlsbad Fish and Wildlife Office, 2730 Loker Avenue West, Carlsbad, CA 92008.

QUINO CHECKERSPOT BUTTERFLY SURVEY PROTOCOL

Determining The Need For A Protocol Survey

Protocol surveys are recommended for all sites partially or completely within the recommended survey areas (see Recommended Quino checkerspot Survey Area Map). Protocol surveys consist of an initial site assessment to determine if the site contains areas recommended for butterfly surveys. If the site is determined to be comprised solely of excluded areas (described below), surveys are not recommended. If a site has areas suitable for butterfly surveys (non-excluded areas), then surveys should be conducted for those portions of the site.

Butterfly emergence from pupae varies according to environmental factors, so the butterfly flight season varies regionally and annually. To assist biologists in initiating butterfly surveys during the beginning of the flight season at their survey sites, we will monitor the phenology of Quino checkerspot larvae and their host plants at a number of occupied reference sites throughout the species' range. Quino checkerspots usually begin flying in February or early March. The Service will distribute information on monitored occupied reference sites to permit holders, jurisdictional authorities, and other parties who have expressed interest prior to the beginning of the flight season.

SITE ASSESSMENTS

Site assessments should be conducted before the first butterfly survey to identify which portions of a site should be surveyed for the Quino checkerspot. These assessments involve conducting a general field survey of the site and broadly mapping excluded areas and butterfly survey areas on a U.S. Geological Survey 7.5' (1:24,000) topographic quadrangle map that has been enlarged 200 percent (See Appendix 1 for example). We request that this site assessment map be submitted with the report within 45 days of the last survey. We will not be providing concurrence on site assessments. We will use negative and positive site assessments and butterfly survey results to refine future survey area maps.

Excluded Areas

The following areas are not recommended for butterfly surveys:

- Orchards, developed areas, or small in-fill parcels (plots smaller than an acre completely surrounded by urban development) largely dominated by non-native vegetation;

- Active/in-use agricultural fields without natural or remnant inclusions of native vegetation (i.e., fields completely without any fallow sections, unplowed areas, and/or rocky outcrops);

- Closed-canopy forests or riparian areas, dense chaparral, and small openings (less than an acre) completely enclosed within dense chaparral;

  "Closed-canopy" describes vegetation in which the upper portions of the trees converge (are touching) to the point that the open space between two or more plants is not significantly different than the open space within a single plant. Dense chaparral is defined here as

vegetation so thick that it is inaccessible to humans except by destruction of woody vegetation for at least 100 meters.

Butterfly Survey Areas

All areas that are not excluded should be surveyed for butterflies, regardless of Quino checkerspot host plant presence, absence, and/or density. The Quino checkerspot is generally associated with sage scrub, open chaparral, grasslands, and vernal pools. Within these communities they are usually observed in open or sparsely vegetated areas (including trails and dirt roads), and on hilltops and ridgelines.

BUTTERFLY SURVEY GUIDELINES

Surveys for Quino checkerspot butterflies should be conducted:

- By a permitted biologist. Quino checkerspot protocol surveys should not be conducted concurrently with any other focused survey (e.g. a coastal California gnatcatcher survey).

- Once per week (weather permitting, see below) for a minimum of 5 weeks throughout the flight season on non-consecutive days. All non-excluded portions of the site should be thoroughly surveyed for butterflies during each weekly survey, even if Quino checkerspots are observed on an earlier visit.

- At an average rate of 10-15 acres (4.05-6.07 hectares) per hour. In large, open areas, 16-33 feet (5-10 meters) on either side of a survey route can generally be examined for Quino checkerspot butterfly presence, so survey routes in these areas should be roughly parallel and 33-66 feet (10 -20 meters) apart. Surveyors should walk within approximately 16 feet (5 meters) of excluded areas such as closed-canopy shrub lands.

- Only under acceptable weather conditions. Weekly surveys may not be considered credible if one or more of the following weather conditions occur: fog, drizzle, or rain; sustained winds greater than 15 miles (24 kilometers) per hour measured 4-6 feet (*m) above ground level; temperature in the shade at ground level less than 60° F (15.5° C) on a clear, sunny day; or less than 70° F (21° C) on an overcast or cloudy day.

A weekly survey should only be missed because of week-long adverse weather. If butterflies are detected during the first 5 weekly surveys, surveyors need not conduct additional surveys. If butterflies are not detected during the first 5 surveys, weekly surveys should continue until the end of the flight season to maximize likelihood of detection of low-density populations. If weather conditions as described above preclude conducting a weekly survey, two surveys can be conducted on non-consecutive days the following week. If adverse weather precludes surveys two weeks in a row, two protocol surveys may be conducted on non-consecutive days each of the two weeks immediately following the weeks of adverse weather.

SURVEY MAPS

- The locations of all adult Quino checkerspot and larvae observed should be mapped on a non-enlarged 7.5' USGS topographic map (Appendix 2). We suggest using a Global

Positioning System (GPS) unit and/or aerial photos if available. All GPS locations should be corrected with an accuracy not to exceed 16.5 feet (5 meters).

- All areas of Quino checkerspot larval host plants should be mapped on the site assessment map (Appendix 1). The plant communities on the site should be mapped.

SURVEY TECHNIQUES

Recommended equipment includes: binoculars, wind meter, thermometer, and a camera with close focus telephoto or macro lens. A GPS unit is also useful. Permitted biologists surveying outside Survey Areas 1 and 3 should carry a butterfly net, clear glass or plastic jar with a lid, and 35 mm film canister.

- Survey carefully to avoid trampling or otherwise harming Quino checkerspot larvae and butterflies. *Plantago erecta* and *P. patagonica*, small, often inconspicuous annual plants, are two of Quino checkerspot's primary host plants. Care should be taken to avoid stepping on all host plants, whether occurring singly, in small patches, or in dense stands. Female Quino checkerspots often select lone plants found on bare soil or in open areas for depositing their eggs.

- Walk slowly and stop periodically within areas that have an especially high potential for Quino checkerspot use, such as patches of host plants or nectar sources; ridgelines and hilltops; bare or sparsely vegetated areas between shrubs; and areas of cryptobiotic soil crusts. Field observations indicate that females may deposit eggs on *P. erecta, P. patagonica, Antirrhinum coulterianum, Cordylanthus rigidus* and/or *Castilleja exserta. C. rigidus* flowers after the adult flight season, often grows intermingled with *C. exserta*, and its vegetative parts resemble those of *C. exserta*. Therefore, care should be taken to correctly identify *C. rigidus* within survey areas, perhaps after butterfly surveys are completed. Nectar plants most likely to be visited include but are not limited to members of the Asteraceae (e.g. *Lasthenia* spp., *Layia* spp., *Ericameria* spp.), *Cryptantha* spp., and *Allium* spp. Quino checkerspots cannot use flowers with deep corolla tubes, such as monkey flowers, or those evolved to be opened by bees, such as snapdragons.

- Stop occasionally to look around–surveyors standing still are more likely to see a moving butterfly. Use binoculars to scan the area ahead and around you, and to help identify butterflies from a distance.

- Follow the movements of other butterflies. Quino checkerspot males are aggressive, can spot other butterflies from a distance, and will chase them away. If a Quino checkerspot is resting with wings closed, they can be very difficult to notice until another butterfly flies by and they give chase.

APPROACHING A BUTTERFLY SUSPECTED OF BEING A QUINO CHECKERSPOT

Approaching a Quino checkerspot butterfly may result in take as defined by the Act and therefore, should only be conducted by a permitted biologist. When approaching a butterfly, move slowly and keep the movement of your hands, arms, legs, and body to a minimum. If the butterfly is first seen in flight, follow it discreetly, keeping at least 5 feet (1.5 meters) away from it until it lands. Do not make sudden movements.

If the butterfly is circling, stand still and wait for it to alight. If it perceives your movement, it is less likely to stop. Observe the flight pattern. If the butterfly is a Quino checkerspot and flies in a zigzag motion with frequent abrupt changes of direction, it is likely a male. If it appears to be flying in a straight line, or with more gradual changes of direction, it is likely a female.

Once the butterfly has alighted, or if it is first seen when alighted, approach it slowly from an angle where it is not likely to perceive your shadow–from the side may give you the best view of the butterfly's body. Take a photograph of the butterfly when approximately 5 feet (1.5 meters) away, or at a greater distance if your camera has adequate telephoto capabilities, taking care not to allow your shadow to fall on the butterfly.

Slowly move toward the butterfly, taking photographs periodically. When your shadow is within about 3 feet (1 meter) of the butterfly, circle slowly around it if necessary to approach it more closely without casting a shadow on it. As you get closer you should move more and more slowly. Insects that are engaged in some activity such as courtship or feeding on flowers are easier to approach than those that are basking.

Biologists may wish to practice their approach and species identification techniques with other grassland nymphalid butterflies such as buckeye *(Junonia coenia)*, California ringlet *(Coenonympha californica)*, and West Coast lady *(Vanessa annabella)* as it will greatly improve their ability to approach and identify Quino checkerspots.

Quino Checkerspots Outside the Areas of Recent Documentation

If a permitted biologist observes a larva or butterfly known or suspected to be a Quino checkerspot outside of Survey Areas 1 and 3, the biologist should attempt to live capture one larva or butterfly using the techniques described below. As a term and condition of their recovery permit, permitted biologists are to notify us by phone at (760) 431-9440 and fax (760) 431-9624 the same day and as soon as possible after capture so we can arrange for identification.

To collect a larva, gently pick it up, taking care not to crush it, and place it in a 35 mm film canister or similar container. Keep the container in a cool place out of direct sunlight.

To capture a butterfly, try to net it using a gentle sweeping motion through the air. If the animal is resting, you may be able to approach it slowly and place the net over it. Do not slap the net on the ground or onto a bush to capture a resting adult–this will likely result in damage or death. Do not chase the butterfly. Many butterflies will return to the same basking site or shrub after a disturbance. Once the adult has been netted, gently place the individual in a clear glass or plastic jar with ventilation. Keep the animal in a cool location while it is transported for identification. Collect the larva or butterfly even if it is inadvertently injured or killed during capture and contact the Service as described below under "Reporting Terms and Conditions."

Map where the known or suspected Quino checkerspot was captured on a non-enlarged 7.5' USGS topographic map (Appendix 2). Include in your field notes a description of the location, habitat type, time of day, date, weather conditions, and the collector's name and permit number.

Reporting Terms and Conditions for Permitted Biologists

If a permitted biologist observes or collects a suspected or known Quino checkerspot adult or larva, within 24 hours the biologist is to notify us by phone (760) 431-9440, and fax (760) 431-9624. Fax a photocopy of a 7.5' USGS topographic map with the observation site marked and a detailed description of the location of the Quino checkerspots.

Within 45 days of the last survey, permitted biologists are to send us a written report based on the terms and conditions of the Quino checkerspot recovery permit and signed by the permitted biologist(s) who conducted the surveys. Survey reports should include:

- Name, permit number, and legible copies of field notes of the permitted biologist(s) who conducted the surveys. Please note that all personnel conducting butterfly surveys should seek authorization under a section 10(a)(1)(A) recovery permit for Quino checkerspot.
- Non-enlarged 7.5' USGS topographic map (and aerial photo if available) with Quino checkerspot larvae and/or adult locations marked.
- Site assessment map with Quino checkerspot larval host plant locations mapped.
- Dates and times of each weekly survey.
- Air temperature, wind speed, and weather conditions at the start and end of each survey.
- List of butterflies observed during each weekly survey.
- List of larval host plants, nectar plants, and plant communities observed on the site.
- Photographs of any Quino checkerspot larvae and/or butterflies observed.

Additional Information and Limitations

Butterfly surveys may not be considered credible if: 1) unfavorable weather, such as drought, limits Quino checkerspot butterfly detectability; 2) the specific survey methods described above are not followed (unless deviations are requested in writing prior to the survey and agreed to by the Service); or 3) additional information indicates that the survey was inadequate or inaccurate. We will attempt to advise the public in advance if unfavorable weather limits or precludes Quino checkerspot butterfly detectability at monitored reference sites.

Questions regarding the protocol or its application to specific projects should be directed to the Carlsbad Fish and Wildlife Office Entomologist, and/or the Permit Coordinator, and/or the staff supervisor responsible for the geographic area in which the survey site is located at (760) 431-9440. We will try to provide a response within 72 hours for time-sensitive questions.

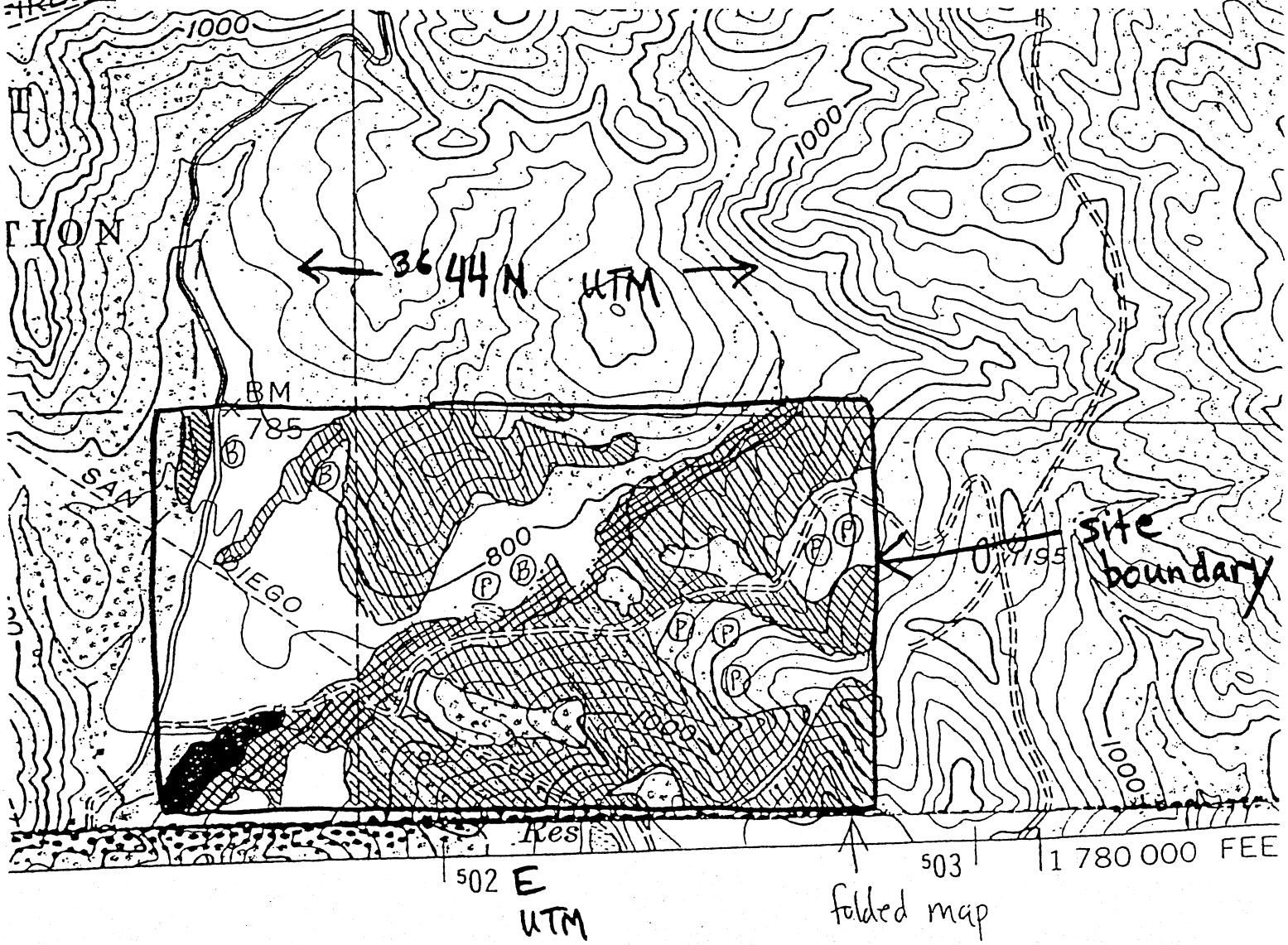
Appendix 1. Sample site assessment and host plant location map.

Figure 1. Site assessment and host plant location map for (site name).

Biologist: (your name)
USGS quad map (map name), CA. 200% enlarged.

Excluded areas:
- closed canopy chaparral
- closed canopy riparian woodland
- closed canopy oak woodland

Larval host plant area locations:
- (B) bird's beak (*Cordylanthus rigidus*)
- (P) dwarf plantain (*Plantago erecta*)



Appendix 2. Sample quino location map.

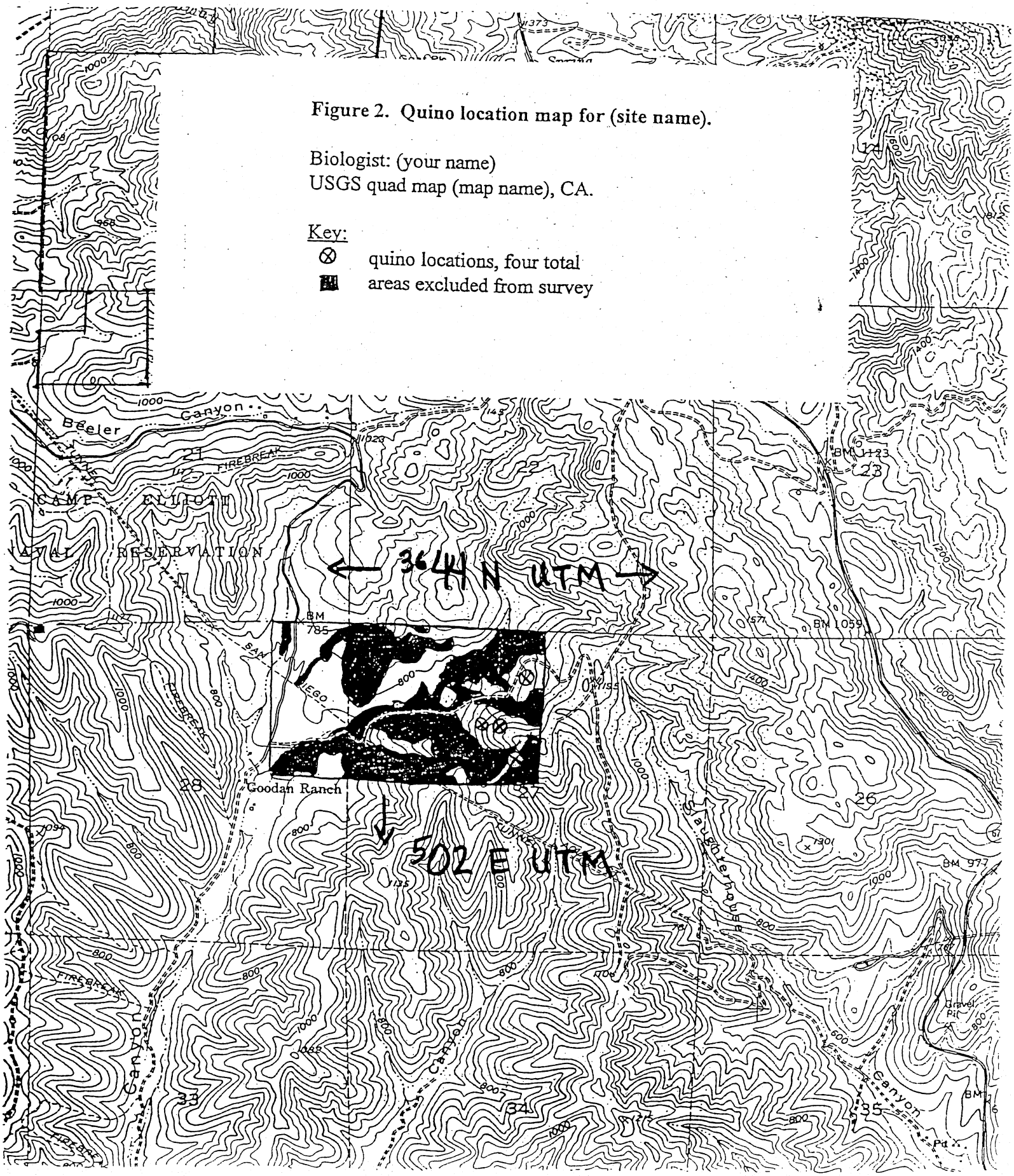


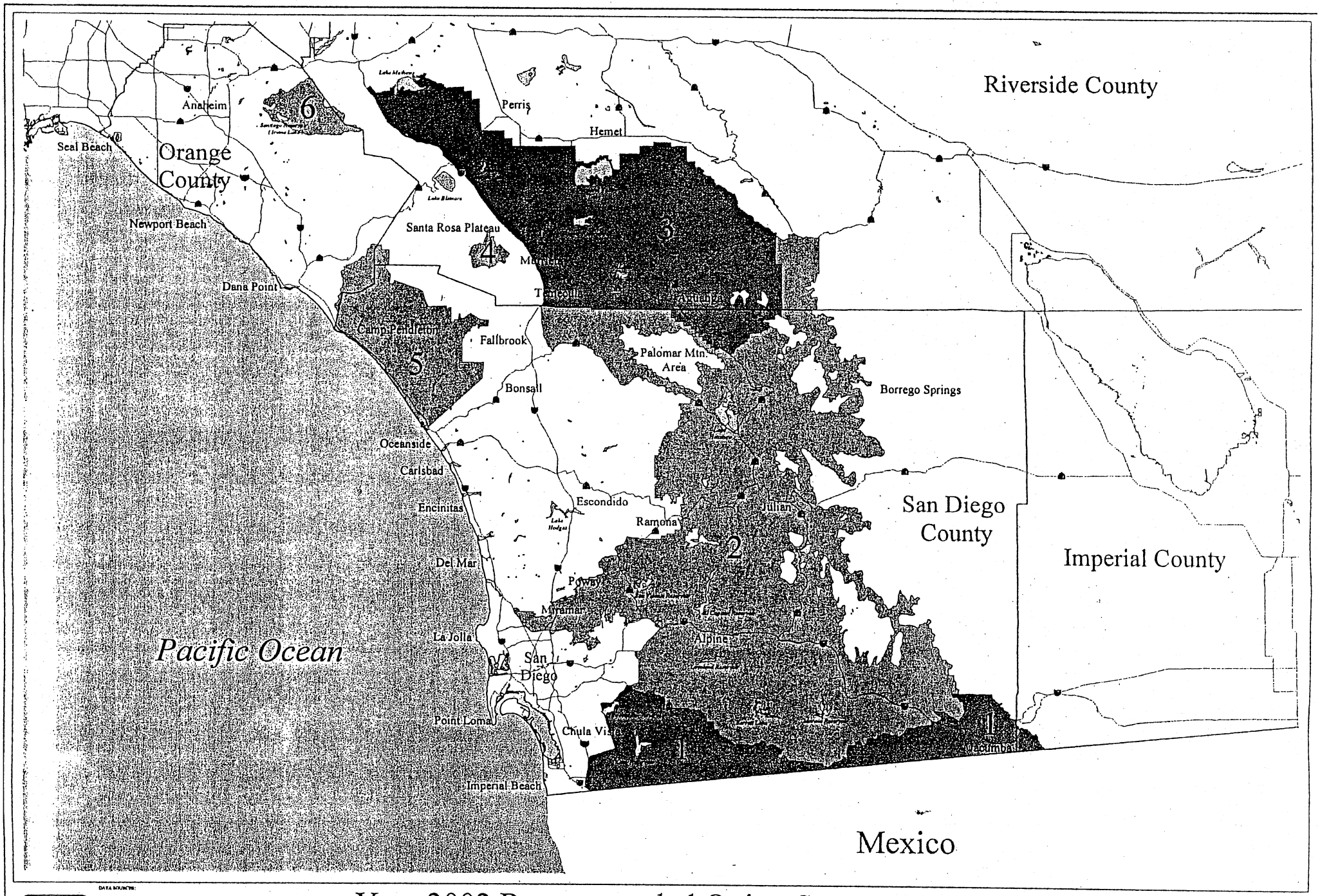
Figure 2. Quino location map for (site name).

Biologist: (your name)
USGS quad map (map name), CA.

Key:

⊗ quino locations, four total

▩ areas excluded from survey



Year 2002 Recommended Quino Survey Areas

20 0 20 40 Miles

80000 0 80000 160000 Feet

50000 0 50000 100000 Feet

Legend

YEAR 2002 RECOMMENDED SURVEY AREAS

SURVEY AREA - CAPTURE NOT ALLOWED

SURVEY AREA - LIMITED LIVE CAPTURE ALLOWED WITH RECOVERY PERMIT

N