CACTUS WREN SURVEY METHODS FOR 2012

In 2006 and 2007, I developed methods in conjunction with Milan Mitrovich, then of the Nature Reserve of Orange County (NROC), and Will Miller of the U.S. Fish & Wildlife Service (USFWS), to map and characterize cactus resources in and around the NROC's coastal reserve, and to survey for Cactus Wrens in areas judged to comprise potentially suitable nesting habitat. These methods were further refined through survey efforts in subsequent years, as we discovered what did and did not work well for volunteers.

Although playback of digital recordings works well to help detect Cactus Wrens, this method is not allowed by the California Department of Fish & Game except through a Memorandum of Understanding (MOU). Therefore, this methodology does not include the use of playback.

In addition to mapping the boundaries of cactus scrub, these methods identify different types of scrub and document habitat composition at each site, thereby allowing reserve managers to build models of habitat suitability for the Cactus Wren by correlating the species' presence with relevant habitat features.

Identification of Planning Areas

As an initial step, specify the Planning Area you are surveying on the data sheet.

Data Recording and Archiving Methods

All field data are recorded on data sheets and the information then entered into an Excel spreadsheet by Study Coordinators. You must keep a backup copy of any data sheets you transmit to the Study Coordinators.

Classification of Cactus Resources

Cactus resources are classified as follows:

- **Cactus scrub:** Expanses of mature cactus scrub judged as capable of supporting a Cactus Wren nest.
- **Proto cactus scrub:** Other cactus-containing habitats judged as likely incapable of supporting a Cactus Wren nest.
- **Satellites:** Individual cactus plants growing outside the boundaries of cactus scrub or proto cactus scrub.

Surveyors will be trained to judge the potential of habitat to support a Cactus Wren nest in accordance with the species' known nesting requirements in the region. In general, nesting Cactus Wrens require cactus at least 1 meter tall growing in a patch expansive enough to protect the nest against predation or disturbance. An isolated, one-meter-tall

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cactus plant does not meet this criterion, and — in general — a large area of cactus that does not include any meter-tall plants would not meet this criterion. A large patch of low-growing cactus may be suitable for nesting if it contains even one larger cactus plant that is afforded protection by the surrounding cactus.

Maps and Mapping

Your site coordinator will provide a Google Earth-generated hard copy map as well as a .kmz file for your survey sites. Before the start of the first survey, overlay the paper aerials with clear acetate. Then draw the mapping Polygons using **fine-point** *Sharpies*. Use a blue *Sharpie* to map cactus scrub Polygons, a green Sharpie to map proto cactus scrub, a red *Sharpie* to map all cholla plants (either inside or outside of cactus scrub Polygons) using a small "c", and a black *Sharpie* to map prickly-pear "satellites" outside of cactus scrub or proto cactus scrub using a small "p".

You will use this same map for all of your surveys. At the end of the season, the map will be transmitted to your site coordinator for digitizing.

Mapping Cactus Scrub

In this study, each contiguous patch of cactus scrub (i.e., scrub with potential to hold a Cactus Wren nest) is referred to as a "polygon." Each polygon consists of at least one "site," and each site receives a unique code. The first part of this code is the Planning Area (i.e., Starr Ranch, Riley Park, or Caspers Park); next is a number corresponding to the grid; third is the number corresponding to the polygon; and fourth is the lowercase letter corresponding to the site. For example, a large polygon situated in the Starr Ranch Planning Area might be divided into two sites with codes "Starr 10-1-a" and "Starr 10-1-b."

Cactus scrub is mapped according to the following procedure:

- Map the Polygon perimeter, erring on the side of making larger polygons rather than dividing them into multiple smaller Polygons.
- If the polygon appears to be large enough to potentially support more than one pair of Cactus Wrens, it should be divided into two or more sites. The dividing line between sites should be ridges, streambeds, other topographic features, or breaks in the cactus scrub. To the extent possible, site boundaries should separate one potential Cactus Wren territory from the next potential territory.
- Finally, indicate the locations of any and all cholla plants within the polygon. Use a small "c" to note a cholla plant (as opposed to "p" which should be used to denote a "satellite" prickly-pear outside of polygons).

Mapping Other Cactus Resources

For cactus resources that do not have potential as nesting substrate (i.e., all areas of proto cactus scrub and satellites), you will map the resources but will not give the resources an Alpha-numeric-alpha identifier, will not record data, and will not survey for Cactus

Wrens. These other cactus resources are regarded as having very low potential for occupancy by Cactus Wrens.

You should, however, check any marginal areas that are on the borderline between proto cactus scrub and cactus scrub. If you find a Cactus Wren or the nest of one, the area should normally be classified as cactus scrub (unless it appears that the wren is simply foraging in the area but nesting somewhere else).

Characterizing Cactus Scrub

Four basic cactus scrub "types" are defined for the purposes of this study:

- **Cactus Scrub Type 1:** Highest quality. Site includes at least 1.0 *contiguous* acre with ≥ 20% estimated areal cover of mature cactus (generally ≥ 1 meter tall). Site may also include habitat with sparser cactus cover.
- **Cactus Scrub Type 2:** Site covers ≥ 1.0 acre. Well-developed cactus patches may be present, but site does not include 1.0 *contiguous* acre with ≥ 20% estimated areal cover of mature cactus (generally ≥ 1 meter tall).
- **Cactus Scrub Type 3:** Small, isolated stands of mature cactus *with* cholla. Polygon (a) covers less than 1.0 acre, *and* (b) includes at least one cholla plant ≥ 1 meter tall. Density of cactus within the Polygon is irrelevant.
- **Cactus Scrub Type 4:** Small, isolated stands of mature cactus *without* cholla. Polygon (a) covers less than an acre, *and* (b) does *not* include at least one cholla plant ≥ 1 m tall. Density of cactus within the Polygon is irrelevant.

Scrub is then further characterized by the presence or absence of cholla. For sites that include cholla, three "cholla types" are defined:

- **Cholla Type 1:** High quality. At least one cluster is fully developed, standing ≥ 1.3 meters tall and in good health with extensive branching.
- **Cholla Type 2:** Medium quality. At least one plant/cluster is ≥ 1.0 meter tall, in good health, with branching extensive enough to readily hold a nest.
- **Cholla Type 3:** Poor quality. Cholla ≥ 1.0 meter tall is present, but no plants or clusters appear to have branching extensive enough to readily hold a nest.

Other data recorded at each site:

- Presence/absence of prickly-pear (*Opuntia littoralis*, *O. oricola*).
- Presence/absence of cholla (*Cylindropuntia prolifera*, *C. californica*).
- Presence/absence of Mexican Elderberry (*Sambucus nigra* ssp. *caerulea*).
- Specification of what fraction of site, if any, is affected by fuel modification.
- Specification of up to four dominant non-cactus overstory plant species in descending order of abundance.

Methods for Surveying for Cactus Wren Presence or Absence

The following survey method is used:

- Surveys should be conducted primarily during the morning hours, but may extend into the early afternoon (typically no later than 2:00 p.m.).
- Surveys must be conducted in fair weather. Wind speed should not exceed 8 mph and surveys should be suspended during periods of rain or drizzle. When surveying in the afternoon, temperatures should not exceed 90°F.
- Survey all potentially suitable nesting habitat (generally with meter-tall cactus). First search for Cactus Wren nests. Indicate on data sheet the number of fresh nests and old/disused nests.
- Do not visit the sites in the same order, but rather reverse or otherwise vary the order you visit the sites from one round to the next.
- At very small sites where you are sure no nests are present, an abbreviated survey of a few minutes may be adequate. At other sites, spend at least 10 minutes walking through or around the site, looking for nests and wrens from various angles.
- At most sites, you will spend at least 10 minutes walking through or around the site, looking for nests and wrens from various angles. At very small sites where no nests are present, an abbreviated survey of a few minutes may be adequate.
- "Spish" loudly and frequently, mostly during the first 5 minutes. Allow at least 5 minutes for Cactus Wrens to respond. Fresh nest(s) mean that wrens are in the area—survey until you find them (or they could possibly be on a nearby site).
- This study identifies "likely territories" as the basic unit of measurement for the Cactus Wren population. A "likely territory" is indicated by the presence of at least one adult Cactus Wren. Independent juveniles (i.e., those without adults nearby) should be recorded and mapped, but do not count as representing "likely territories" since they may be dispersing birds.
- All Cactus Wren sightings are recorded on the data sheet and entered into the Excel spreadsheet, but in cases where an adult is seen moving between sites the surveyor identifies only one "likely territory." The "likely territory" is credited to the first site where an adult Cactus Wren is detected. In all cases where you see a wren moving between sites, you must note this on the field data sheet and enter the information into the "notes" section of the Excel spreadsheet (for all sites involved).
- If only one adult is detected at Site "A" and a second lone adult, with or without young, is detected at an adjacent Site "B" during the same round of surveys, you must search for additional adults at both sites. If no second adult can be found at either site within several minutes, you normally should conclude that the two adults probably represent a single pair foraging apart, and thus should recognize

only one "likely territory" (at Site "A"). You may recognize two "likely territories" in this situation, but only if evidence suggests that the two adults are not paired. In any case, relevant observations should be recorded in the field and entered into the "notes" section of the data sheet (for both Site "A" and Site "B").

- Surveyors shall watch and listen for California Gnatcatchers, which are recorded if detected during the six-minute survey period, either on or near the site.

Conducting multiple rounds of surveys is necessary to estimate detection probabilities. These surveys are best conducted between 1 March and 30 June. A benefit of surveying into June is that more data on productivity can be gathered.

Conducting multiple rounds of surveys increases the potential for recording a Cactus Wren adult, pair, or family group at more than one site. In cases where Round 1 yields a wren detection at Site "X" but not at nearby Site "Y," and these results are reversed during Round 2, the surveyor normally should recognize only one "likely territory" (at Site "X"). The surveyor may recognize two "likely territories" in this situation, but only if he/she uncovers evidence suggesting that more than one pair of wrens is involved. In any case, the relevant observations should be recorded in the field and entered in the "notes" section of the Excel spreadsheet (for both Site "X" and Site "Y").

The situation of one pair of Cactus Wrens being probably or definitely detected on multiple sites, either during a single survey day or on different days, should be uncommon in a typical year, but may be much more common during periods of drought or other environmental stress. For example, in the very dry year of 2007, adult Cactus Wrens were observed to move up to several hundred meters in a single morning. Food resources presumably were scarce in 2007, and many Cactus Wrens appeared not to nest, thus conserving their resources and leaving them free to wander widely in search of food. It is appropriate for surveyors to take these types of considerations into account when making judgment calls regarding the number of "likely territories" represented by a cluster of sightings in a given area during a given season.

2012 Cactus Wren Surveys, Orange County

Robert A. Hamilton
Hamilton Biological

Updated 2-24-12

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Survey, mapping, and habitat classification methods are the same as in previous years of the study.

Study Coordinators

Trish Smith, The Nature Conservancy

Sandy DeSimone, Starr Ranch Audubon Sanctuary

Donna Krucki, OC Parks

Robb Hamilton, Hamilton Biological, Inc.

Online Workspace

Please register as a member of the Coastal Cactus Wren Conservation Network "online workspace": (http://conserveonline.org/workspaces/cacwnetwork).

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PDF's of many CACW articles, published and unpublished, have been uploaded to facilitate spread of information.

ONE AMAZING BIRD

A SHORT FILM BY DON DESJARDIN

Systematics

Two main groups “look like different species” (Rea and Weaver 1990)

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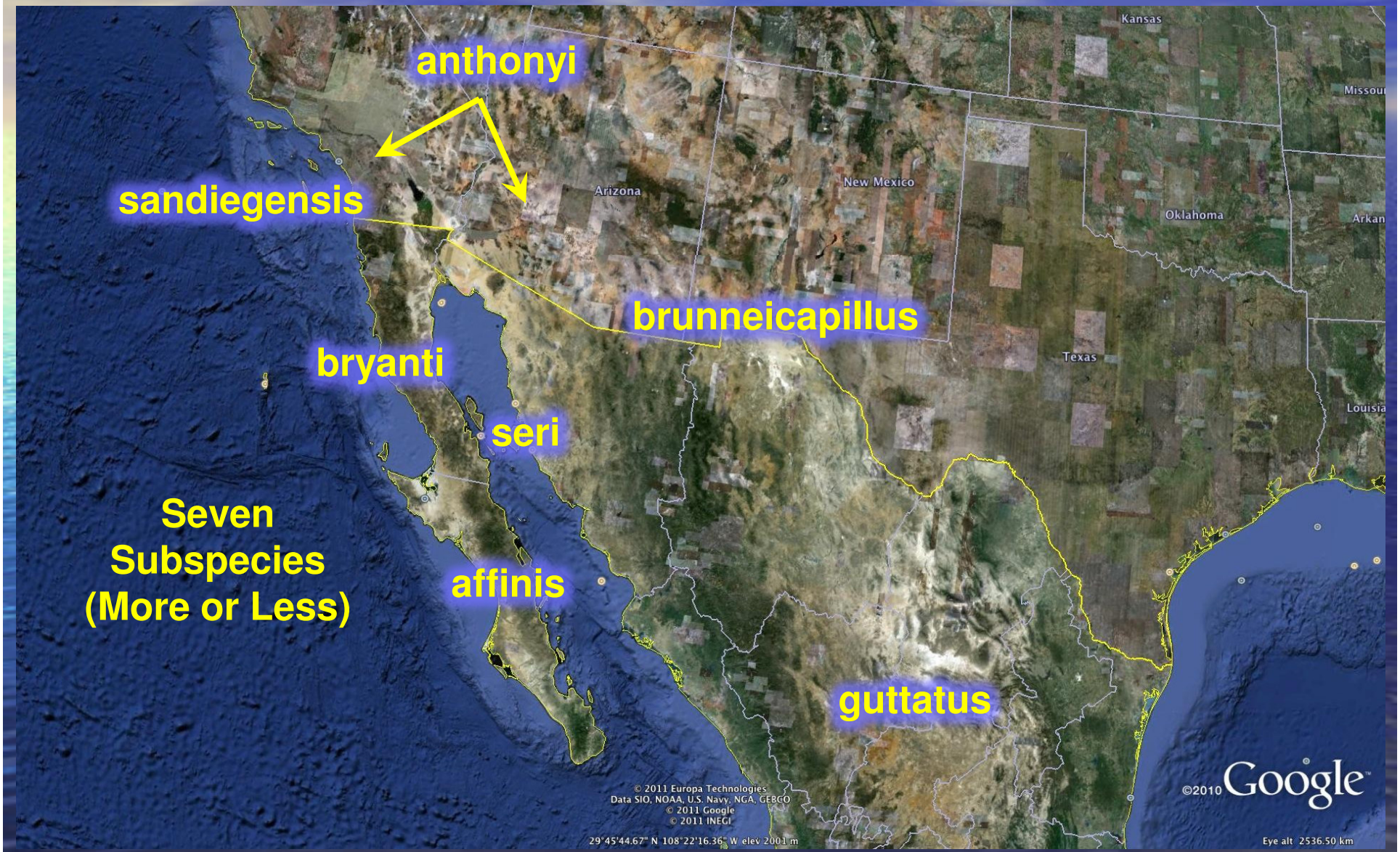

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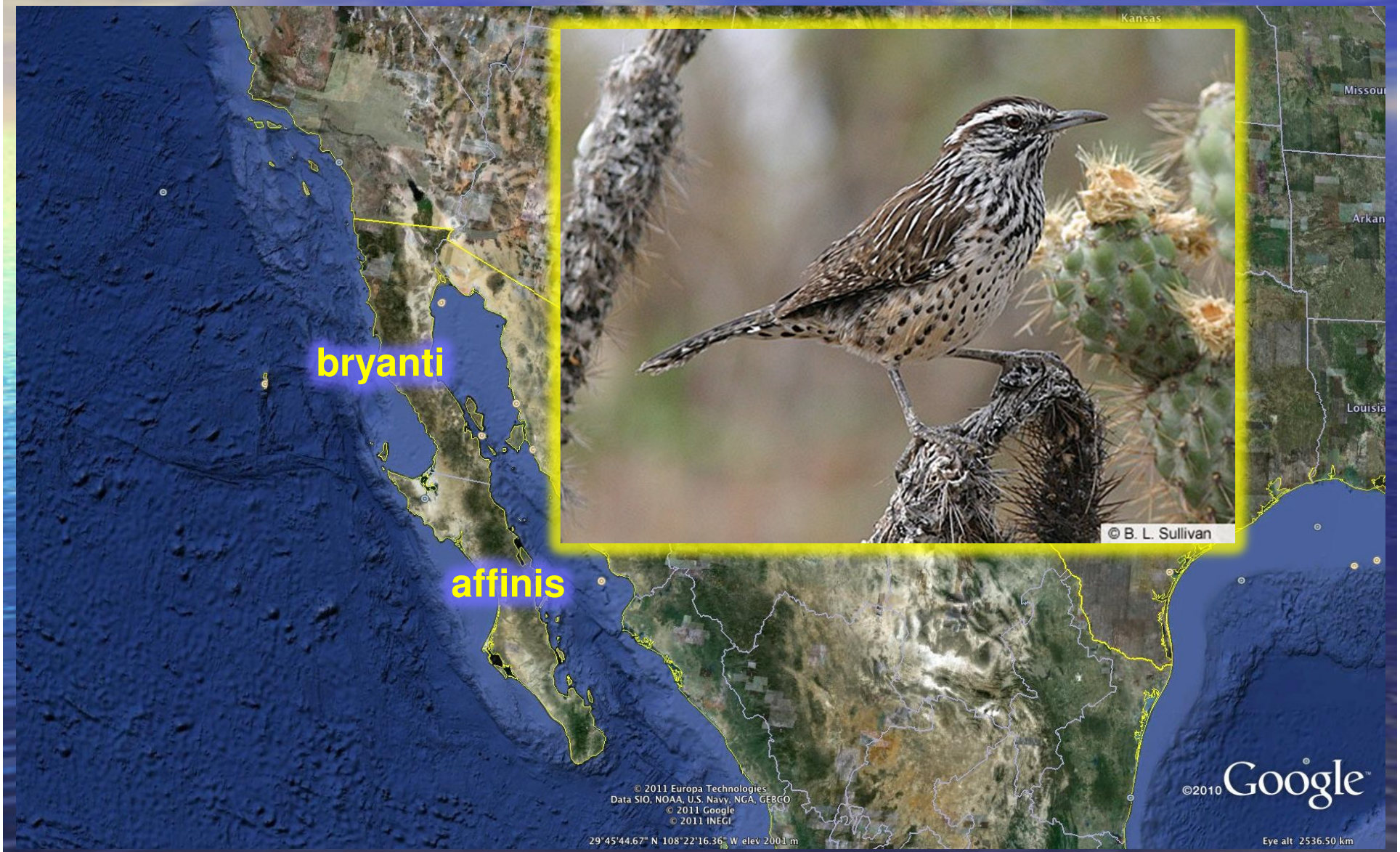


Systematics

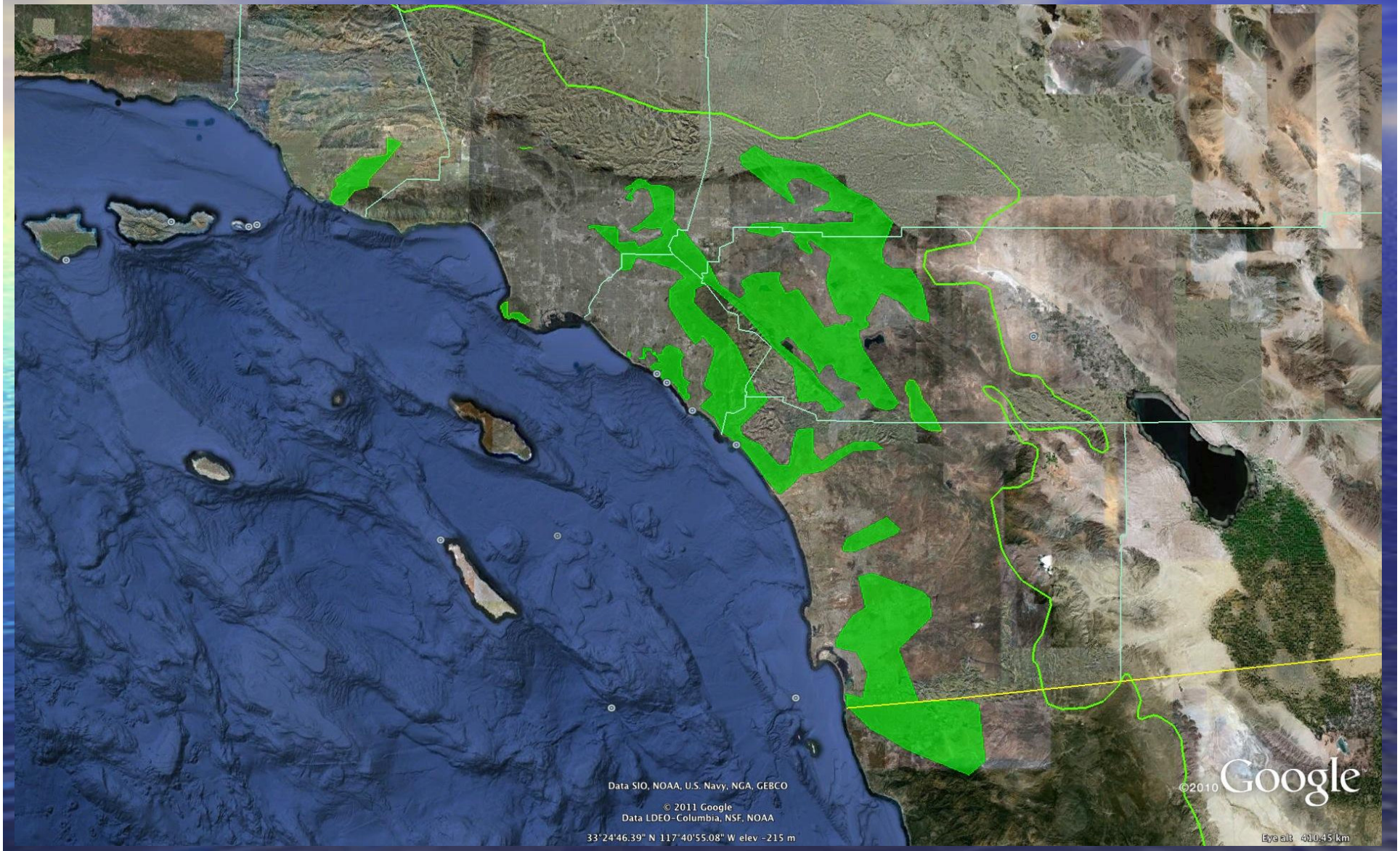
Systematics

anthonyi

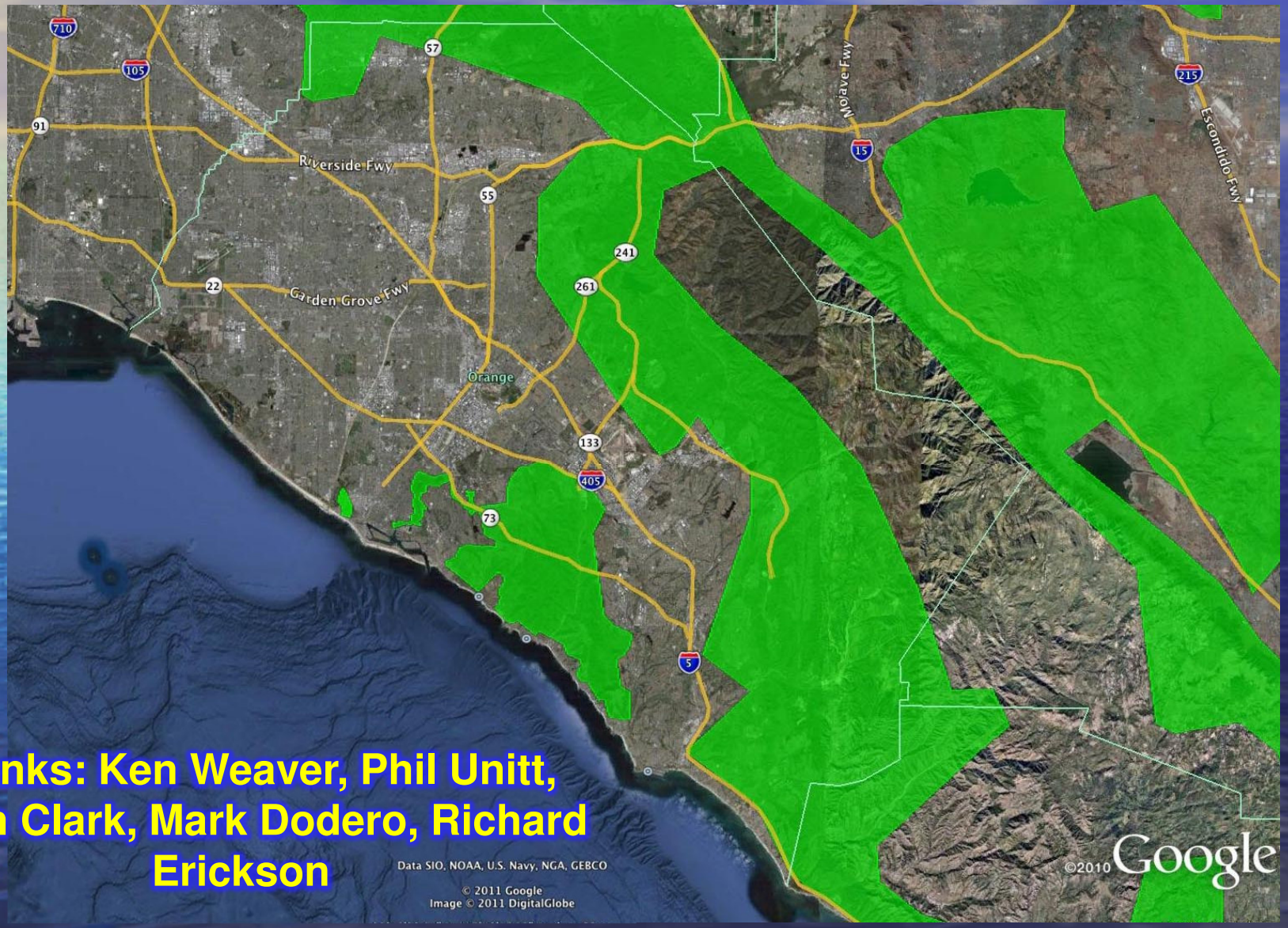
sandiegensis

Brian Small

Coastal Cactus Wren Range Map



Orange County Range Map



Thanks: Ken Weaver, Phil Unitt, Kevin Clark, Mark Dodero, Richard Erickson

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California Species of Special Concern.

Sandiegensis

Tail barring seems to be a highly variable trait:

anthonyi

sandiegensis

peninsular

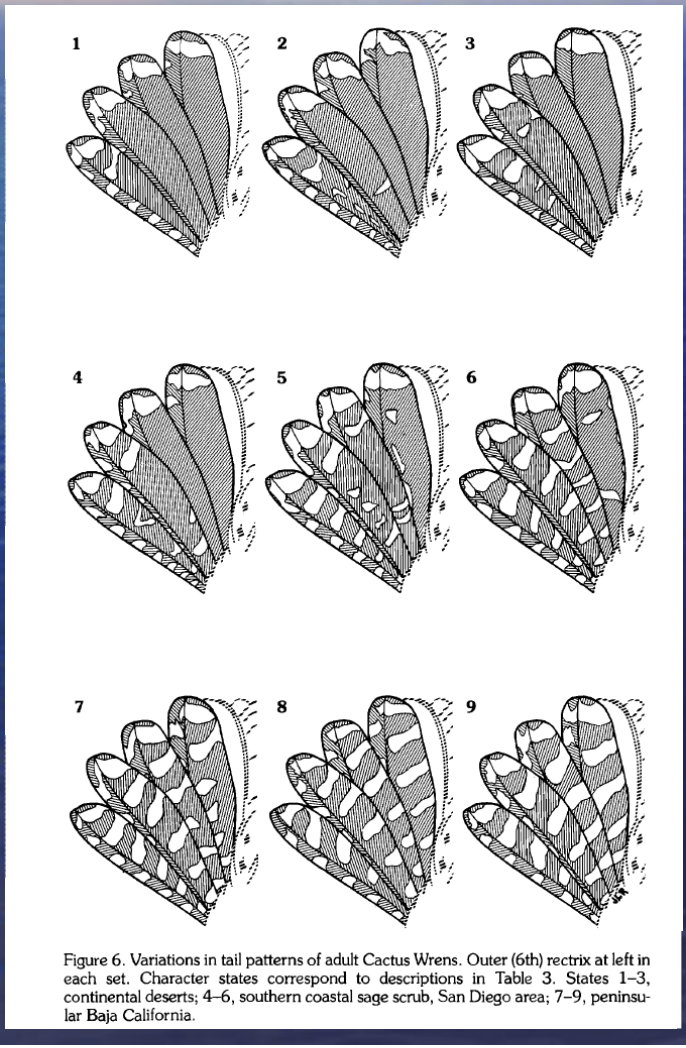
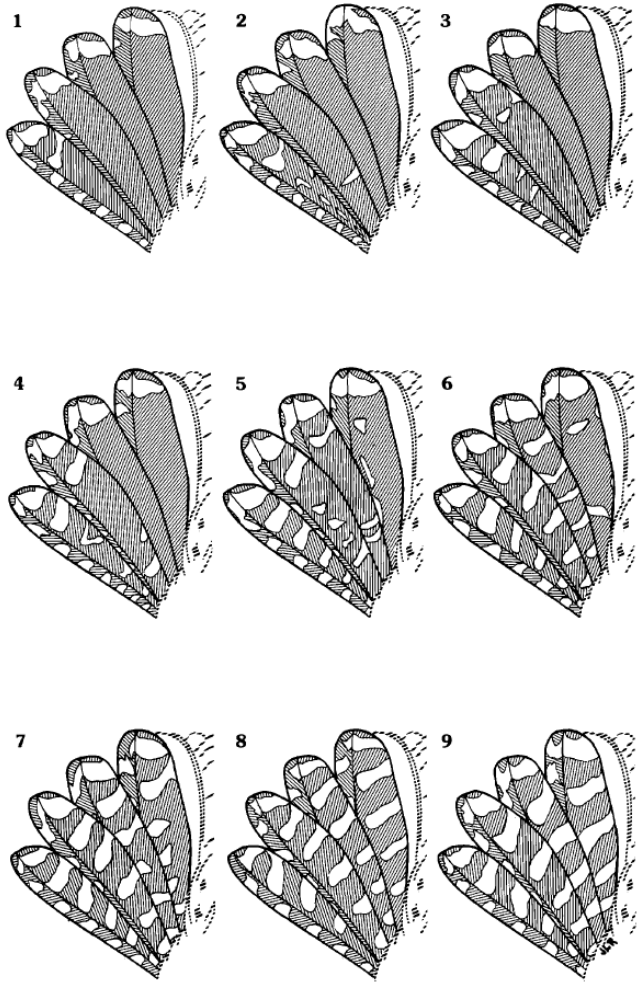


Figure 6. Variations in tail patterns of adult Cactus Wrens. Outer (6th) rectrix at left in each set. Character states correspond to descriptions in Table 3. States 1–3, continental deserts; 4–6, southern coastal sage scrub, San Diego area; 7–9, peninsular Baja California.

Rea & Weaver (1990)

Central Orange County



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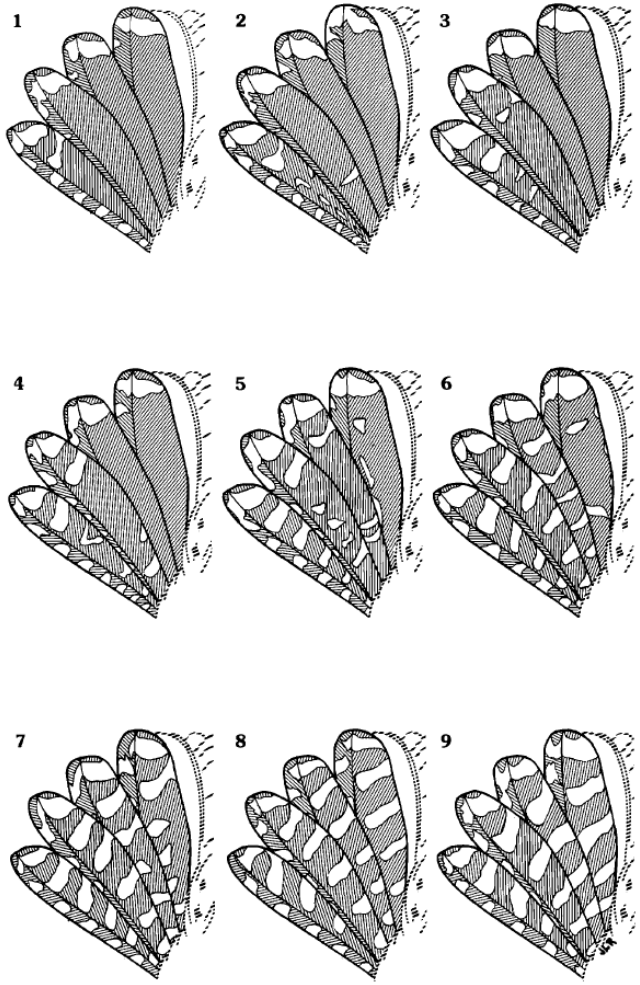

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Cactus Wren Biology

Habitat Requirements

"Coastal" CACW require mature cactus in coastal sage scrub (CSS), or sometimes grassland, mainly below 1500 feet elevation. They nest almost exclusively in *Opuntia* (prickly-pear) and *Cylindropuntia* (cholla) at least 1 meter tall.

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In rough terms, the average "core use area" for coastal CACW ranges from about 2 to 5 acres. This will vary from site to site and from year to year. Larger areas needed farther inland and during years with low

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Movements

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See also the following figures . . .

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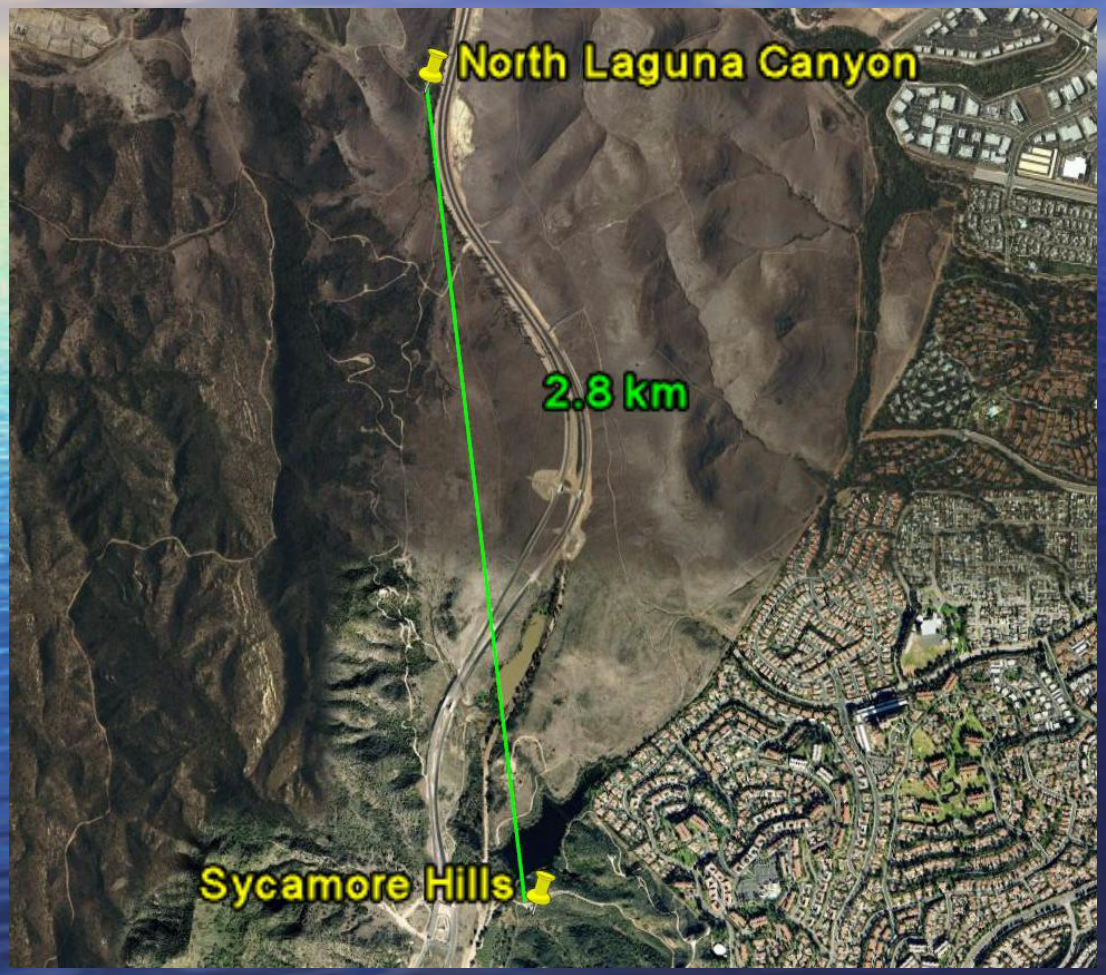
Anecdotal Evidence of Poor Dispersal



CACW not showing signs of recolonizing Sycamore Hills, roughly 2.8 km south of nearest presumed "source" population.

Translocation of CACW now being undertaken in the Sycamore Hills.

Cactus Wren Biology

Anecdotal Evidence of Poor Dispersal

CACW did not colonize Upper Newport Bay for several decades, despite high-density CACW populations only 3-4 km away. Wrens at UCI have line of sight to UNB. Translocation also occurring here.

Cactus Wren Biology

Foraging Techniques

The CACW is a shrubbery skulker, foraging primarily on the ground or low in the vegetation for insects.

Cactus Wren Biology

Diet

Primarily insects year-round. Beal (1907) summarized food habit data for Cactus Wrens taken from Los Angeles-San Bernardino areas during July through January and found that 83% of all stomach samples (n = 41) consisted of animal matter: 27% beetles, 27% Hymenoptera (wasps, bees, and ants), 15% grasshoppers, 5% Hemiptera (bugs), 5% Lepidoptera (caterpillars) and 3% spiders.

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The 17% that was vegetable matter consisted mainly of fruit pulp from cactus, elderberry, and redberry (*Rhamnus*) plus small amounts of seeds.

Cactus Wren Biology

Diet

Primarily insects year-round. Beal (1907) summarized food habit data for Cactus Wrens taken from Los Angeles-San Bernardino areas during July through January and found that 83% of all stomach samples (n = 41) consisted of animal matter: 27% beetles, 27% Hymenoptera (wasps, bees, and ants), 15% grasshoppers, 5% Hemiptera (bugs), 5% Lepidoptera (caterpillars) and 3% spiders.

The 17% that was vegetable matter consisted mainly of fruit pulp from cactus, elderberry, and redberry (*Rhamnus*) plus small amounts of seeds.

Fruits and seeds may become more important during the cooler months when animal matter is less abundant and

Cactus Wren Biology

Displays

Coordinated breeding displays include tail fanning and wing lifting by both the male and female.

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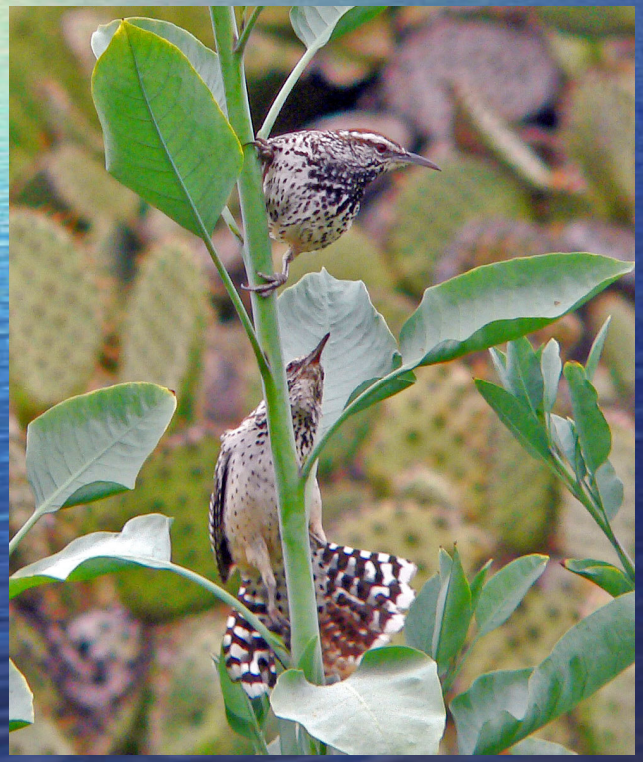

Cactus Wren Biology

Nests

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Entrance of the nest often oriented to take advantage of convective ventilation provided by prevailing winds.

Cactus Wren Biology

Nest Boxes!

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The same study found that annual adult survivorship ranged from 58 percent to 74 percent.

Snakes are thought to be the main predator on CACW nests. Cooper's Hawks, Greater Roadrunners, domestic cats, and other predators can also pose threats.

Cactus Wren Biology

Threats

Habitat loss, degradation, and fragmentation probably represent the most critical management issues facing coastal CACW. In recent years, massive wildfires across the region have intensified these threats.

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Habitat loss, degradation, and fragmentation probably represent the most critical management issues facing coastal CACW. In recent years, massive wildfires across the region have intensified these threats.

Disease could also be playing a role.

Increasing cover of annual grasses in scrub could also be a factor.

Coastal populations may be experiencing loss of genetic variation through genetic drift. Unlike natural selection, in which more adaptive traits are preferentially selected for, genetic drift refers to random changes in gene frequencies within a limited population, often with adverse consequences for viability of the population.

2012 Study Methods

Training and Assistance

Today you will be trained in the field methods discussed in this presentation (weather permitting).

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The "Cheat Sheet" provided to you summarizes the relevant information on a two-sided page for reference in the field.

The data sheets, Cheat Sheet, and this PowerPoint presentation will be posted at the online workspace to be downloaded for your reference.

2012 Study Methods

Your Survey Area

You will be tasked with mapping/classifying cactus scrub and surveying for CACW within a given Planning Area.

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The goal is to complete 10 rounds of surveys at each site; 2 rounds per month between February and June/July.

2012 Study Methods

First Step: Map the Cactus Resources

You will receive an aerial covering your survey area(s), from Google Earth.

2012 Study Methods

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The paper aerials will be overlain with clear acetate. You will draw on the acetate using ultra fine-point Sharpies.

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The color of the Sharpie will indicate whether a mapping outline refers to an area of “cactus scrub” or “proto cactus scrub.”

2012 Study Methods

Mapping of Cactus Scrub Polygons

An expanse of cactus that you judge capable of supporting a CACW nest will be called a cactus scrub "Polygon."

2012 Study Methods

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What does potentially suitable habitat look like?

2012 Study Methods

Suitable Nesting Habitat, Typical Example

2012 Study Methods

An Atypical Example

2012 Study Methods

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Map the entire Polygon perimeter using a blue *Sharpie*.

2012 Study Methods

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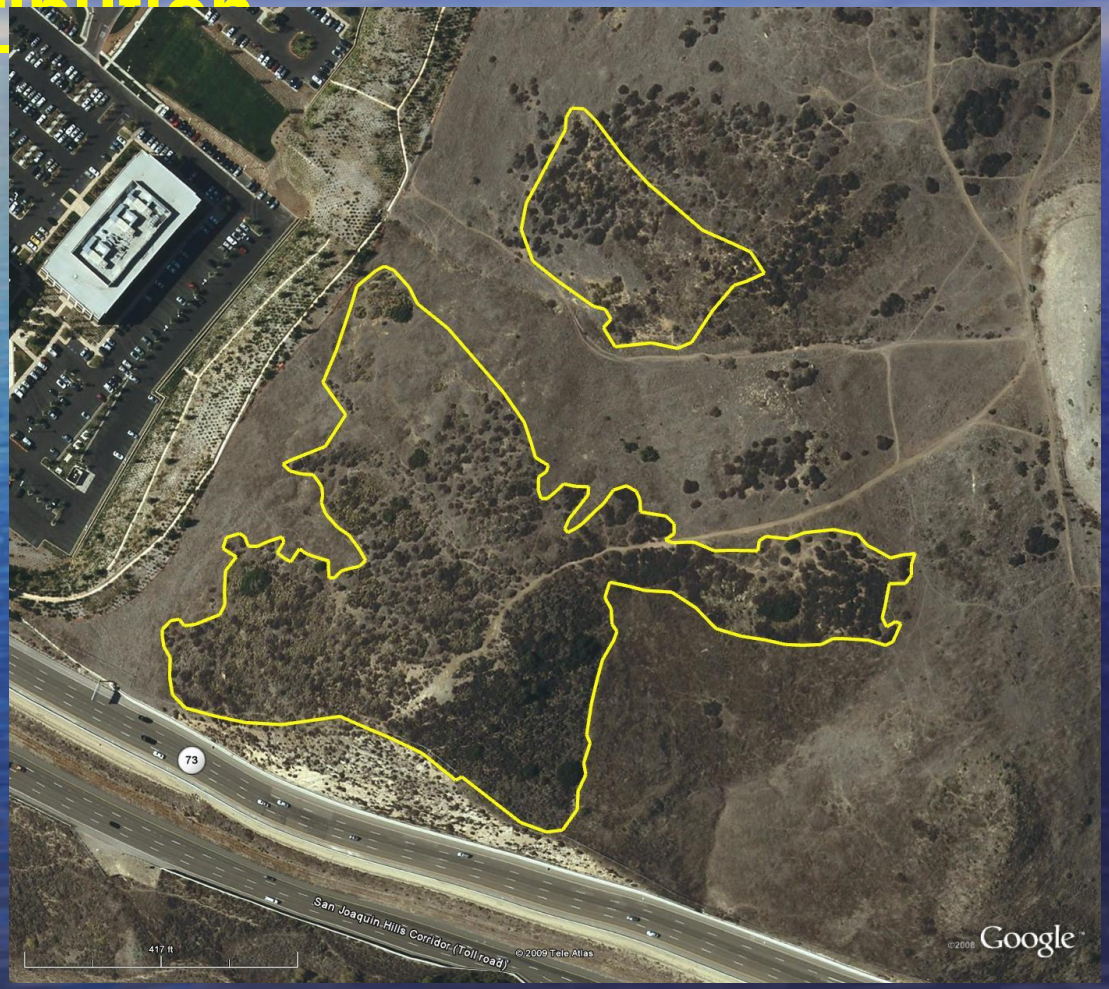
A couple examples . . .

2012 Study Methods

Good

2012 Study Methods

Probably Too Precise – May Depend on CACW Distribution



2012 Study Methods

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In many cases, a Polygon will not contain more than one Site.

Each Site gets a unique, three-part ID, which we'll review later. You will write this ID on the map.

2012 Study Methods

Bottom Polygon Divided into Two Sites (Blue Line)

2012 Study Methods

Proto Cactus Scrub

Expanses of cactus-containing habitat that do not include any cactus that you judge to be capable of supporting a CACW nest are called “proto cactus scrub.”

2012 Study Methods

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Areas of proto cactus scrub are not called Polygons or Sites, and these areas do not receive unique ID's.

No data sheet is filled out for proto cactus scrub and no survey is completed.

2012 Study Methods

Map Cholla Separately in All Areas

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Use a small "c" to denote the cholla plants on the map.

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Use a small "c" to denote the cholla plants on the map.

In areas that have a lot of cholla do not try to map every individual cholla plant; instead, map small clusters of cholla.

2012 Study Methods

Map Prickly-Pear "Satellites"

Prickly-pear is abundant and widespread in the region; unlike cholla, isolated prickly-pear plants will not provide potentially suitable habitat for CACW.

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Use a small "p" to denote prickly-pear satellites on the map.

2012 Study Methods

Types of Cactus Resources

To review, this study identifies three basic cactus resources:

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Cactus scrub: Expanses of mature cactus scrub judged as capable of supporting a CACW nest. Cactus scrub is mapped as Polygons and Sites. These receive unique ID's and are surveyed for CACW. The rest of this presentation focuses only on cactus scrub Polygons and Sites.

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Proto cactus scrub: Other cactus-containing habitats judged as likely incapable of supporting a CACW nest. These areas are mapped but no CACW survey is completed and no ID is assigned.

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Proto cactus scrub: Other cactus-containing habitats judged as likely incapable of supporting a CACW nest. These areas are mapped but no CACW survey is completed and no ID is assigned.

Satellites: Individual prickly-pear plants growing outside

2012 Study Methods

Identifying Polygons and Sites

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First part of code is the Planning Area (e.g., Saddle Creek North).

Second is a number corresponding to the polygon.

Third is a lowercase letter corresponding to the site.

2012 Study Methods

Identifying Polygons and Sites

You will assign each cactus scrub site a 3-part code.

First part of code is the Planning Area (e.g., Saddle Creek North).

Second is a number corresponding to the polygon.

Third is a lowercase letter corresponding to the site.

For example, a single polygon might be divided into two sites with codes “Saddle Creek North -1-a” and “Saddle Creek North -1-b.”

2012 Study Methods

Data Sheet

Name(s) of the investigator(s)

2012 Study Methods

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Planning Area

2012 Study Methods

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Please write legibly so that the Study Coordinators don't have to call or e-mail you!

2012 Study Methods

Bird Info

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Presence/absence of California Gnatcatchers at or near the Site. Map these with a small "g" but no data needed.

2012 Study Methods

Data Sheet Comments

Note whether the scrub is Type 1, 2, 3, or 4.

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Cactus Scrub Type 1: Site includes at least 1.0 contiguous acre with ≥ 20% estimated areal cover of cactus ≥ 1 m tall. Sparser/lower cactus scrub may also occur. [An acre is 209 feet square]

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Cactus Scrub Type 2: Site covers ≥ 1.0 acre, but does not include at least 1.0 contiguous acre with ≥ 20% estimated areal cover of cactus ≥ 1 m tall.

Cactus Scrub Type 3: Small, isolated stand *with cholla*. Site (a) covers less than 1.0 acre, and (b) includes at least one cholla plant ≥ 1 m tall. Density of cactus is irrelevant.

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Cactus Scrub Type 4: Same as Type 3, but Site *does not*

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Cholla Type 1: High quality. At least one cluster is fully developed, standing ≥ 1.3 m tall and in good health with extensive branching.

2012 Study Methods

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Cholla Type 1: High quality. At least one cluster is fully developed, standing ≥ 1.3 m tall and in good health with extensive branching.

Cholla Type 2: Medium quality. At least one plant/cluster is ≥ 1.0 m tall, in good health, with branching extensive enough to readily hold a nest.

2012 Study Methods

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Cholla Type 2: Medium quality. At least one plant/cluster is ≥ 1.0 m tall, in good health, with branching extensive enough to readily hold a nest.

Cholla Type 3: Poor quality. At least one plant/cluster is ≥ 1.0 m tall, but no plants or clusters appear to have branching extensive enough to readily hold a nest.

2012 Study Methods

CACW Survey Methods

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2012 Study Methods

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Surveys should be conducted primarily during the morning hours, but may extend into the early afternoon.

Wind speed ≤ 8 mph; you will receive a Beaufort Scale that will enable you to estimate wind speed without a meter.

Don't survey in rain or drizzle. If surveying in the early afternoon, temperatures should not exceed 90° F.

2012 Study Methods

CACW Survey Methods

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Your maps will be digitized after the field season is over.

2012 Study Methods

CACW Survey Methods

Record all adult and juvenile CACW.

2012 Study Methods

CACW Survey Methods

Record all adult and juvenile CACW.

Map all adults/pairs/family groups using a “W” and indicating the date – do this by specifying the survey round (1, 2, 3, etc.).

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Adults and juveniles are generally easy to tell apart,

2012 Study Methods

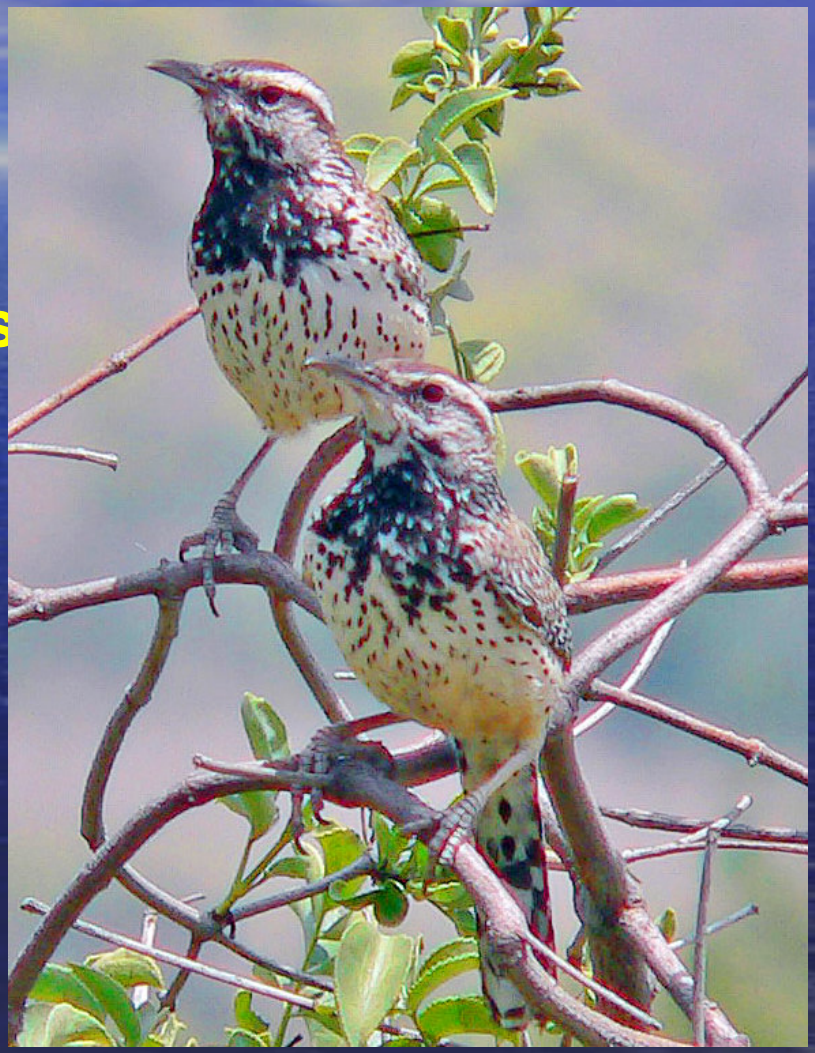
Adult CACW

Important marks visible:

Heavily marked upper breas and throats

Long bills (poor angle)

Eye-color vaguely reddish on lower bird (poor angle)



2012 Study Methods

Juvenile CACW

Important marks visible:

Upper breast and throat mostly white; spots diffuse.

Sharply defined facial marks

Fresh-looking plumage

Short bill (poor angle)

Eye color should be dark: Red color could be effect of flash and/or reflection of red from buckwheat flowers

2012 Study Methods

Adult CACW

Important marks visible:

Extensive spotting on underparts

Long bill (poor angle)

Weakly defined facial marks

Worn-looking plumage

Late in the season, starting around July, adults become so worn that their spots start to fade. Juveniles also start to look worn, so plumage less reliable.

2012 Study Methods

Adult CACW

Important marks visible:

Long bill

Weakly defined facial marks

Worn-looking plumage

Heavily marked throat and
upper breast (getting worn)

2012 Study Methods

Juvenile CACW

Important marks visible:

Stubby bill

Dark eye

Sharply defined facial marks

Chocolaty brown on head – color lightens with sunlight and wear.

Stubby tail, down on head, fleshy gape (very young only)

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If you follow CACW for an extended period, you may find that they are using multiple Sites. This should always be noted on the data sheet for each Site, and later entered into the "Comments" section of data sheet (for each Site involved).

2012 Study Methods

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If you follow CACW for an extended period, you may find that they are using multiple Sites. This should always be noted on the data sheet for each Site, and later entered into the "Comments" section of data sheet (for each Site involved).

With repeated visits, there is potential for CACW to move around and cause confusion about how many pairs are

2012 Study Methods

CACW Survey Methods

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2012 Study Methods

CACW Survey Methods

Finally…

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CACW Survey Methods

Finally…

If you detect a CACW adult/pair during an earlier round at Site "X" but not at nearby Site "Y," and these results are reversed during a later round, you should normally recognize only one territory (at Site "X").

2012 Study Methods

CACW Survey Methods

Finally…

If you detect a CACW adult/pair during an earlier round at Site "X" but not at nearby Site "Y," and these results are reversed during a later round, you should normally recognize only one territory (at Site "X").

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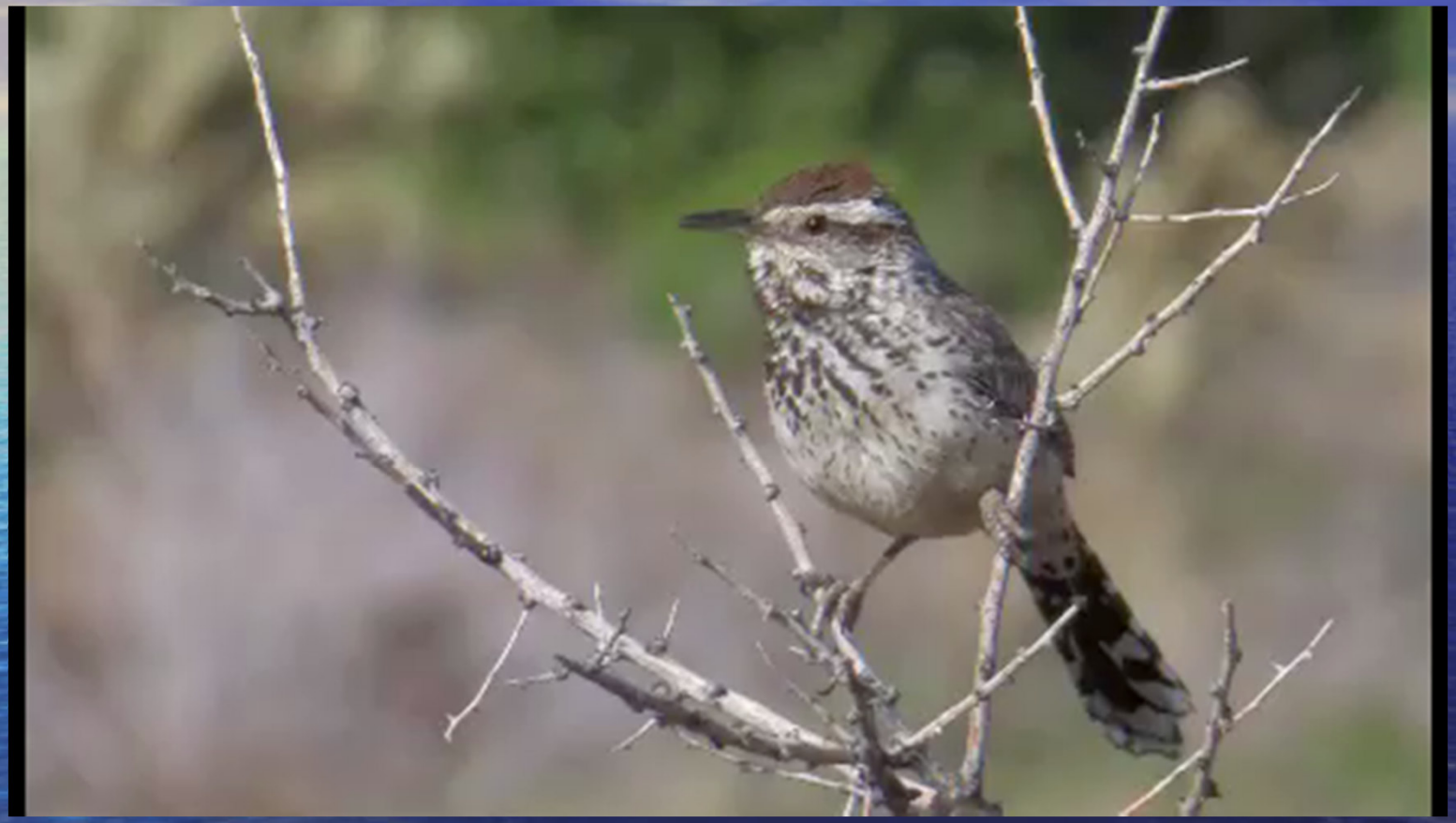
ONE LAST VIDEO!



COURTESY OF DON DESJARDIN