Translocation Plan

STUMP SPRINGS

Clark County, Nevada

June 26, 2014
DRAFT

Prepared by the U.S. Fish and Wildlife Service

Purpose of translocation: Population Augmentation

Critical Habitat Unit: none

Recovery Unit: Eastern Mojave

Recipient site land ownership: Bureau of Land Management

Action permitted by federal and state wildlife agencies? (list permits, BOs): Yes

federal: TE-08592A-1 (Douglas G. Myers, Zoological Society of San Diego)
FWSDTRO-1 (Roy Averill-Murray, USFWS – Desert Tortoise Recovery Office)

state: S35185 (Allyson Walsh, Desert Tortoise Conservation Center)
S36694 (Edward Koch, USFWS)

EA: NV-050-2005-173
BO: 2013-F-0273, 2013-F-0273.AMD1

Date of proposed translocation: Fall 2014

Source of translocatees: Desert Tortoise Conservation Center, Clark County, Nevada

Number of translocatees: To be determined (see Specific Goal of Translocation)

Translocation Plan Narrative

Site description

The Stump Springs translocation site lies within an undesignated multiple-use area managed by the BLM in the western portion of Clark County. The Stump Springs site covers approximately 85,000 acres (344 km^2) northwest of the town of Sandy Valley (Figure 1). It is bordered by State Highway 160 (SH 160) to the northeast, Tecopa Road to the northwest, and California to the southwest, with the approximate 4900-foot (1,500-meter) elevation line in the Spring Mountains generally forming the eastern boundary. The Greater Trout Canyon translocation site lies on the opposite (north) side of SH 160. The Stump Springs translocation site occurs outside of designated critical habitat, but it does lie within a block of contiguous desert tortoise habitat that may be valuable for population connectivity (i.e., between the Ivanpah Critical Habitat Unit, Death Valley National Park, and areas to the north; USFWS 2012a). Several culverts provide potential connection between the Stump Springs and Greater Trout Canyon sites.

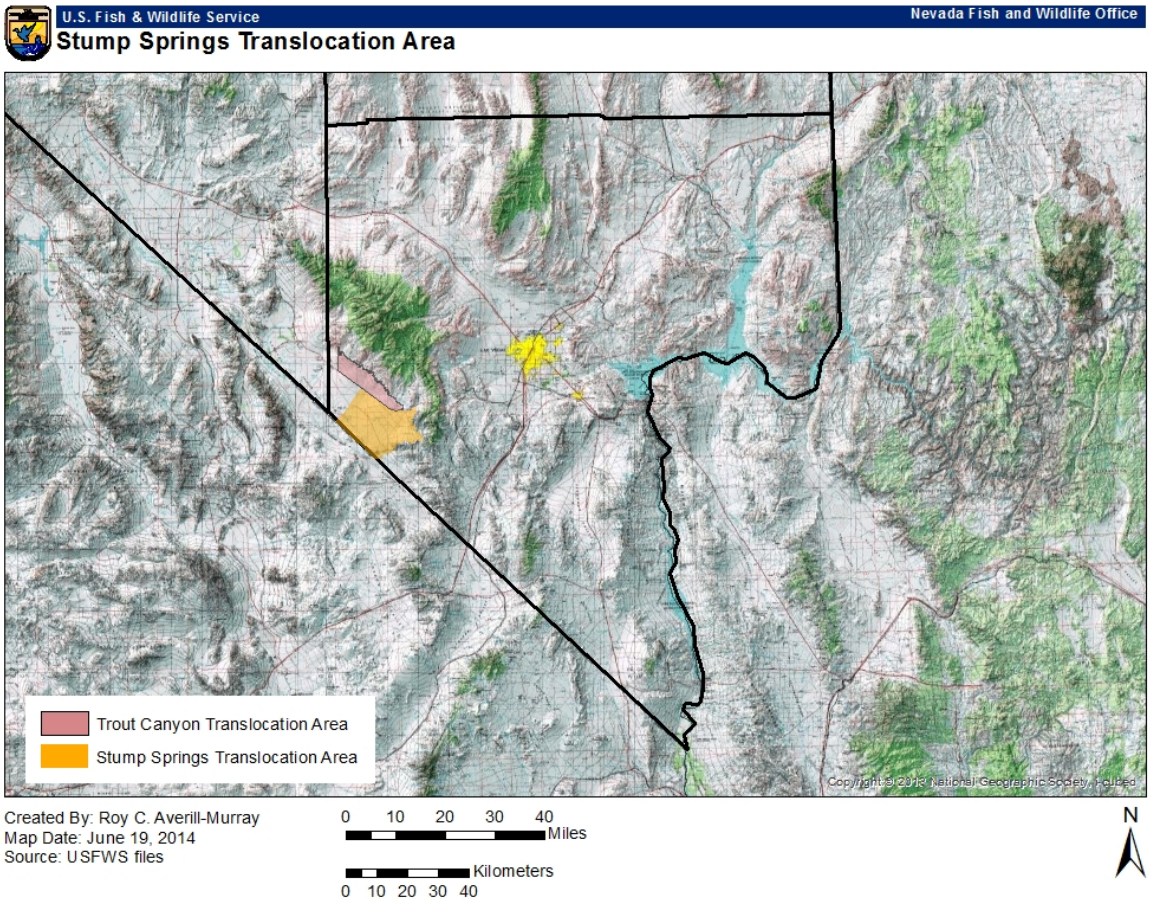

Figure 1. Stump Springs Translocation Area in relation to the Greater Trout Canyon Translocation Area and southern Nevada.

Mojave Desert scrub dominates the site. Small amounts of salt desert scrub, gypsum soils, and mesquite/catclaw habitats occur on the valley floor in the southern portions of the site. Most of the site lies on the floor of Pahrump Valley at elevations of 2,600-3,000 feet (800-900 meters). Small, isolated hills and ridges occur in the southern portion of the site. The major drainage direction is northeast to southwest; major washes include Lovell Wash and Potosi Wash.

Several well-used unpaved roads cross the site, one of which connects SH 160 with the town of Sandy Valley. Two existing utility corridors bisect the area. A 3,500 foot-wide corridor established in 2009 as a component of the Energy Policy Act of 2005 runs approximately 18 miles in a northwest-southeast direction. The corridor designated in the BLM's Resource Management Plan (RMP) does not have a specified width, but BLM believes it to be 2,640 feet. It runs parallel but not contiguous to the 2009 corridor for most of its length.

Several solar-development applications overlap the translocation area (Figure 2). Each of these applications are considered "pending" under the programmatic solar environmental impact statement (U.S. Bureau of Land Management and U.S. Department of Energy 2012), but none have progressed in at least three years. The two applications by Abengoa Solar, Inc. primarily lie on the western side of Tecopa Road, and development is not planned on the eastern side of the road. The Boulevard Associates application comprises 3,272 acres proposed for photovoltaic development, and the Brightsource Energy application comprises 6,787 acres proposed for concentrating solar ("power tower") development. Any future development of these applications must take into consideration desert tortoises and will accommodate translocated tortoises that have dispersed throughout the translocation area. However, in order to minimize future conflicts with potential solar development, a 61,174-acre (247.6-km^2) priority release area has been identified (Figure 3). The population augmentation will focus on this priority area, subject to the limit of tortoises that can be added to the priority area (see Specific Goal of Translocation and Figure 4, below) and the number of tortoises available for release.

Four grazing allotments that overlap the area are currently closed. There are numerous mining claims that potentially impact the site. Most of these are concentrated in the Spring Mountain foothills on an approximate 6,000-acre block in the southeast corner of the area. Validity exams have not been conducted on any of the claims, most of which are held by three entities. The BLM has designated one community mineral materials site for commercial sales with approximately 6,400 acres located near Sandy Valley. The last recorded use of this site was in 1994. Off-highway-vehicle use within the area is restricted to existing roads and trails. One motorized off-highway-vehicle event occurs within the unit, the Barstow-to-Las Vegas motorcycle race. This event was held in 2010 and expected to continue annually. The race course is on existing roads and trails.

Nevada Department of Wildlife (NDOW) Hunt Management Unit 262 includes and surrounds the translocation area. Portions of two Wild Horse and Burro Herd Management Areas (HMA) are located within the area. The Red Rock HMA includes 25,000 acres within the area and has an Appropriate Management Level (AML) of 50 burros and 50 horses. The Wheeler Pass HMA includes about 22,000 acres in the area and has an AML of 47-66 horses and 20-35 burros.

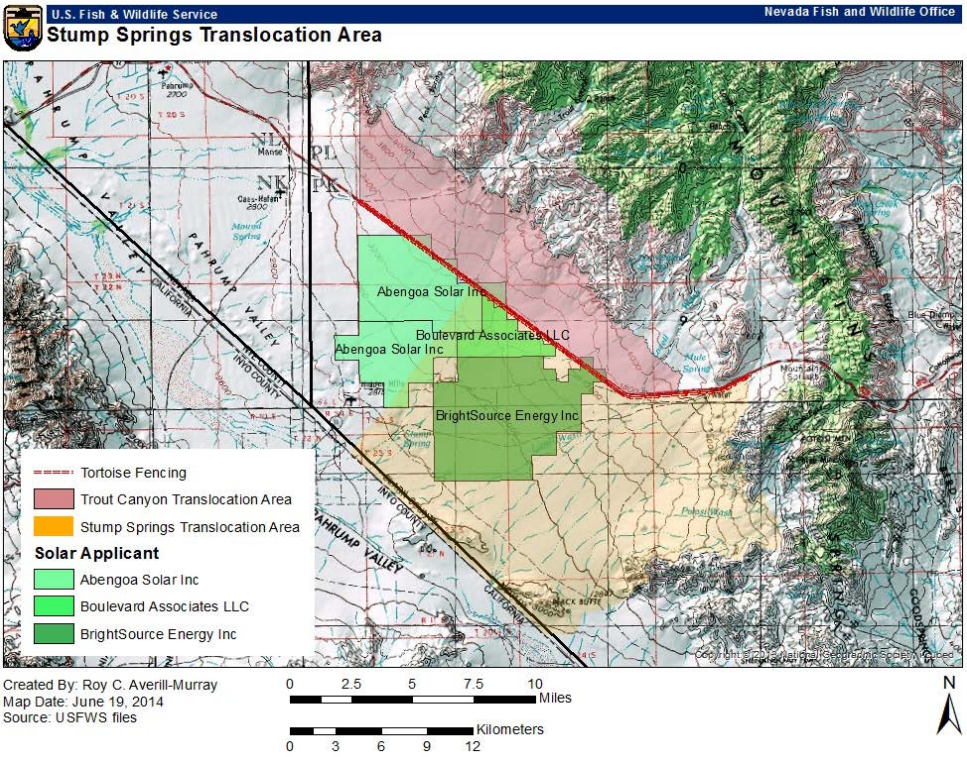

Figure 2. Pending solar-development applications in the Stump Springs Translocation Area.

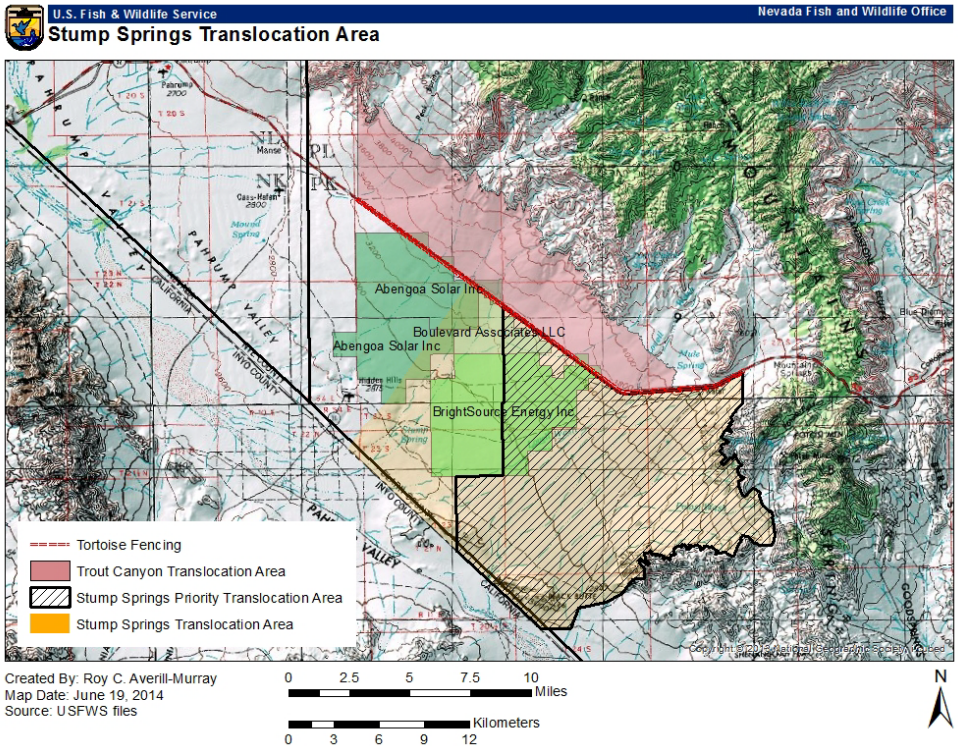

Figure 3. Stump Springs priority translocation area.

The area surrounding Stump Springs is currently classified as experiencing "severe drought" conditions (Palmer Drought Severity Index = -3.0 – -3.9; Tinker 2014). Since the beginning of 2012, moderate to severe drought conditions have been present in the area during May-July 2012, May-July 2013, and February-April 2014 (National Climatic Data Center 2014). Precipitation outlooks for the area suggest that three-month rainfall totals may exceed the 1981-2010 average by up to 0.2 inches between August and November 2014 (NOAA/National Weather Service 2014).

Translocation will have no effect on current multiple use of the site. For example, future grazing of the site will be managed in accordance with BLM's current resource management plan relative to allotments that occur outside designated critical habitat and Areas of Critical Environmental Concern. Potential conflicts with increased numbers of desert tortoises and human activities will be accommodated through routine planning, monitoring, and consultation between the BLM and Fish and Wildlife Service.

Selection of release sites

Tortoises will be released within an approximately 6,569-acre (26.6-km^2) release zone within the priority translocation area (Figure 4). If the full translocation area is used, releases will occur within a larger 21,150-acre (85.6-km^2) area (Figure 4). Specific release points will be selected close to the time of release and will take into account conditions at that time. The goal is to distribute tortoises throughout the site while minimizing risks to individuals by staying at least 6.5 km from unfenced portions of paved roads that are not otherwise bounded by topographic features or other hindrances to tortoise dispersal (most desert tortoises are expected to settle within 6.5 km of their release point; USFWS 2012b). A group of up to 40 juvenile tortoises (carapace length <100 mm) may be released at a higher elevation within the translocation area, but outside the release area defined in Figure 4, as part of a related habitat-use experiment conducted by San Diego Zoo Global and the U.S. Geological Survey. These tortoises, which are not expected to disperse as far as translocated adults, will be compared to a cohort at a lower elevation in the Greater Trout Canyon translocation area. Existing roads will be used to access different portions of the release area, and tortoises will be distributed broadly rather than released within one localized area.

Density/Trends of Resident Tortoise Population

The nearest historic population study plot is a 1-mi^2 (2.6-km^2) plot within the western end of the Greater Trout Canyon translocation area, approximately 7.5 km northwest of the nearest point of the Stump Springs translocation area (Figure 4). The plot was surveyed in 1987 and 1992 (Hardenbrook, undated; Holle et al. 1992). In 1987, 31 tortoises were captured at least once (24 >180mm carapace length) on the plot, and estimated adult abundance was 30 $\pm$ 25 (2 SE; = 11.6/km^2) (Hardenbrook, undated). Surveyors found 28 adult shell remains (ratio of dead:live adults = 1.17), most of which were estimated to have died >2 years previous to the survey. In 1992, 27 tortoises were captured at least once (25 >180mm carapace length), and estimated adult abundance was 19 $\pm$ 8.6 (= 7.3/km^2) (Holle et al. 1992). Surveyors found 13

shell remains on the plot (dead:live = 0.52), at least 5 (38%) of which were tortoises marked in 1987.

More recent surveys were conducted southeast of Pahrump, Nevada, during the 2008 range-wide monitoring season between 19 and 29 May (USFWS 2012c). Field workers surveyed 75 transects totaling 847 km in the area that includes the Stump Springs site. Estimated density was 2.9 adult tortoises per km^2 (CV = 43.9). Within the entire Pahrump Valley (i.e., north and south of Pahrump), 28 of 58 tortoise detections were of shell remains; the ratio of dead:live tortoises (0.93) exceeded the average for all other monitoring strata in Nevada (range = 0.16-0.83; USFWS, unpubl. data). Twenty-nine full or partial transects were walked within the boundaries of the Stump Springs translocation site, and only 16 of 34 tortoise detections were of live animals. Between 2004 and 2012, estimated tortoise density across the Eastern Mojave Recovery Unit, within which this site lies, had declined to 2.6 adult tortoises per km^2 (USFWS, unpubl. data).

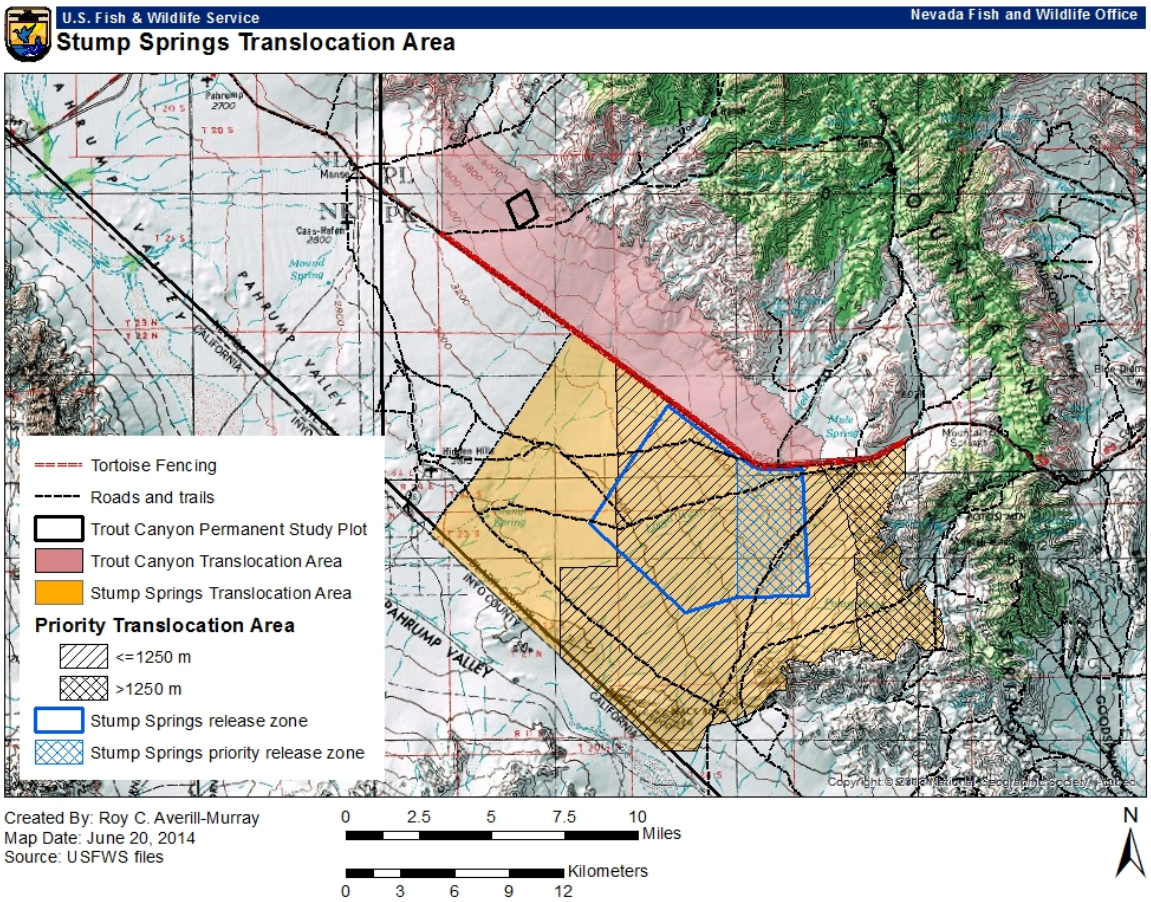

Figure 4. Release zones within the Stump Springs Translocation Area.

Additional surveys are planned for Fall 2014, prior to translocation, to determine a more precise, site-specific estimate of tortoise density within the Stump Springs area. To adjust for the number of tortoises that could not be detected because they were deep underground in burrows, we will make behavioral observations on resident tortoises outfitted with radio transmitters in the Greater Trout Canyon translocation area to estimate the proportion that are not detectable while surveys are conducted on transects (USFWS 2012c). Barring an unexpectedly high population estimate this fall, it is apparent that the tortoise population in the area has suffered a decline of some degree in the moderate past. The 2014 estimate will determine the maximum number of tortoises to be added to the local population (see Specific Goal of Translocation, below).

Specific Goal of Translocation

Population augmentation is an important tool for conservation of the Mojave desert tortoise (USFWS 2011). The primary goal for translocation to the Stump Springs area is to augment the population to increase density to a level comparable to that seen within the surrounding Eastern Mojave Recovery Unit. For a successful translocation, the number of tortoises in any area should not exceed the capacity of the surrounding desert. Little to no information on specific habitat characteristics or measures of habitat quality exist relative to carrying capacity for Mojave desert tortoises (USFWS 2011). Therefore, we will use densities recently observed elsewhere in the recovery unit to set a conservative population-density target. Densities described by a single standard deviation of the mean tortoise density for a recovery unit are not unusually high. Given appropriate habitat and tortoise management, the rationale described above results in a maximum post-translocation density of adult tortoises not to exceed the 68% confidence interval (i.e., one standard deviation) of the mean density in the respective recovery unit (USFWS 2012b). For the Eastern Mojave Recovery Unit, the density represented by the upper 68% confidence limit is currently 3.3 adult tortoises/km^2 (USFWS, unpubl. data).

Typically, Mojave desert tortoises occur at elevations <4100 feet (1250 m). However, we defined the translocation area to include the approximate 4900-foot (1500-m) elevational limit, and the release zone is within the expected dispersal distance (6.5 km) of this elevation. To ensure that we do not underestimate post-translocation density in the event that few tortoises disperse above 4100 feet, we subtracted the area above 4100 feet (approximately 8900 acres [36 km^2]) in determining the maximum number of tortoises to augment the population. For the priority translocation area, this maximum density equates to a total of 700 adult tortoises ([212 km^2 – 36 km^2] * 3.3 adult tortoises/km^2). The maximum post-translocation density for the full translocation area is 1016 adult tortoises ([344 km^2 – 36 km^2] * 3.3 adult tortoises/km^2). The number of adult tortoises released to Stump Springs will not exceed the difference of the maximum limits defined above and the estimate obtained from the Fall 2014 surveys.

Juvenile tortoises (<180 mm carapace length) have naturally higher mortality rates than adults, so fewer tortoises released in this size category are expected to contribute to the population or compete for resources than adult translocated tortoises. As a conservative limit, however, the number of juvenile tortoises released will not exceed the number of adults released. We expect

that approximately 13% of the total population consists of tortoises ≥180 mm carapace length (Turner et al. 1987), so limiting the maximum number of juveniles (which normally comprise about 87% of a population) released to the total number of adults released will add fewer tortoises to the population than would be normally represented in a full size distribution.

Despite the area currently experiencing drought conditions, the proposed translocation targets an area that is considered to have high tortoise habitat potential (Nussear et al. 2009). Furthermore, recent research has shown that survival of translocated tortoises is similar to non-translocated tortoises even under drought conditions (Esque et al. 2010; Nussear et al. 2012). Therefore, while overall survival may be lower than in wetter years, we expect augmentation to improve population status by providing a net increase in tortoise numbers. Delaying augmentation until a wetter year may increase individual survival, but inaction could extend indefinitely given the uncertainty of future drought. Proceeding in Fall 2014 increases the probability that additional tortoises will more immediately contribute to population recovery.

Health Considerations

Health in a population context can be thought of as the ability of a population to perform all of its ecological functions with typical efficiency (Hanisch et al. 2012). Inherent in this is the idea that healthy populations should be able to remain resilient and self-sustaining in the face of naturally occurring disease. It is neither possible nor desirable for organisms to be "parasite and disease free", so there is rarely cause to consider translocation unfeasible due to disease or parasites if reasonable precautions are taken (IUCN 2013). However, all aspects of the translocation process can cause stress-induced disease (but see Drake et al. 2012), so strict disease-prevention, quarantine, and handling/release protocols will be implemented based on the most recent guidance available (e.g., Woodford 2000; USFWS 2012b) and procedures described below.

Health status of resident tortoise population

One pathogen of long-standing concern is *Mycoplasma agassizii*, a bacterium known to cause upper respiratory tract disease. Seroprevalence of *M. agassizii* was recorded at levels up to 13% in the Stump Springs area (Sandmeier et al. 2013). Documented presence of *M. agassizii* indicates that extensive disease screening for this pathogen is likely unnecessary (IUCN 2013). However, in order to collect data for post-translocation monitoring purposes, we will conduct complete health assessments according to standardized protocols (USFWS 2013), including collection of biological samples, on each tortoise found during the Fall 2014 surveys.

Health status of translocatees

Current guidance developed for wild-to-wild translocation projects provides a structured approach for evaluating health status of individual desert tortoises prior to translocation (USFWS 2013; Figure 5). All tortoises to be translocated in this project will be selected from the collection residing at the Desert Tortoise Conservation Center (DTCC) in Las Vegas. The DTCC is operated by San Diego Zoo Global (SDZG), and comprehensive physical exam and sample collection protocols were developed by San Diego Zoo Global veterinarians in conjunction with

other consulting veterinarians, scientists, and biologists. These protocols include health assessments that take into account body condition, clinical signs of disease, exam findings (e.g., coelomic masses or white mucous membranes), weight history, medical history while at the DTCC, presence of ectoparasites, concurrent illness in cohorts, and other factors determined to be important in appropriately assessing an individual's health and determining suitability for translocation. The protocols have been adapted from published recommendations (Berry and Christopher 2001) and IUCN guidelines (Woodford 2000). Quarantine before release is a basic disease-prevention precaution for translocation, and potential stress caused by confinement may usefully bring out latent infections (IUCN 2013). All tortoises to be released will have undergone a quarantine period of ≥90 days with repeated health evaluations (Woodford 2000).

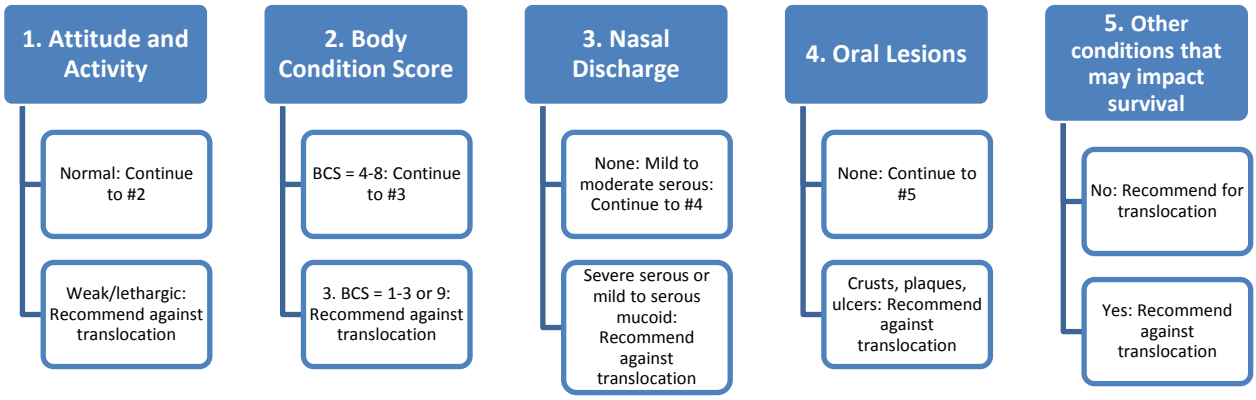

Figure 5. Algorithm for evaluating if desert tortoises are suitable for translocation, taken from USFWS (2013) guidance for wild-to-wild translocation projects. BCS = body condition score.

Given the particular condition of using captive tortoises for population augmentation, additional health-related eligibility criteria will be applied beyond those depicted in Figure 5 (Attachment 1; these criteria may be modified to incorporate new information). For example, individuals housed together in pens will be disqualified collectively and subjected to additional quarantine if a single individual shows signs of disease. Additional individual criteria to minimize risks to individual translocated tortoises, as well as to the resident population in the Stump Springs area, include screening for bladder stones and ectoparasites and ensuring that each translocated tortoise has a history of maintained or increased weight (Attachment 1). Health-history documentation of all release candidates will be evaluated, and all release candidates will be assessed according to current protocols. The history of repeat evaluations increases the chances of observing an abnormal condition and minimizes the chance of releasing a sick individual. Only tortoises that pass the DTCC's comprehensive health screening will be released.

Genetic Considerations

The Stump Springs translocation area is located approximately 40 km west of the DTCC. Moving tortoises within 175 km of the DTCC ensures that the vast majority of released tortoises will remain in a genetic unit equivalent to that of their origin (actual locality of genetic origin, not

that of the area immediately surrounding the DTCC) (USFWS 2012d). Additionally, the risk of inducing outbreeding depression in desert tortoises is low and would only manifest itself on a time scale of 600 years or more (Averill-Murray and Hagerty, in press). As a result, we consider genetic analysis of individuals as a means of selecting tortoises to be translocated to be unnecessary. Negative population effects will be further reduced in the event any translocated individuals do happen to originate from a more distant population (which we expect to be a rare occurrence) if they are poorly adapted to conditions in the Stump Springs area and do not successfully integrate into the resident population (Edwards and Berry 2013).

Monitoring

A specific monitoring approach and design will be developed depending on available funding. Tortoises found during the Fall 2014 pre-release surveys and all translocated tortoises will be given permanent marks to provide the option to comparatively monitor residents and translocatees through future mark-recapture surveys. For example, a potential approach would use survivorship and health of translocatees and of residents to describe the success of the translocation.

Archived blood samples of all translocated tortoises will be available for comparison with resident tortoises if particular questions about health or genetics arise in the future. Other monitoring topics that may be pursued include long-term changes in prevalence of upper respiratory tract disease, as measured by observation of clinical signs of disease, and correlates of population change with respect to habitat characteristics or threats.

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Attachment 1

Health Eligibility Criteria
2014 Translocation from DTCC to the Stump Springs Translocation Area

Initial Assessment of Pen Group Eligibility

- Assess **all** individuals occupying pen concurrently.
- The pen group is preliminarily deemed eligible if no tortoises in the pen have signs of disease.
- If one or more tortoises in the pen show mild to moderate signs of disease, the pen is not eligible for release, and all tortoises in pen will be treated and observed with re-assessment for eligibility after 3 months.
- If one or more tortoises in the pen has a Body Condition Score $\leq$ 3 and/or moderate to severe signs of disease, those individuals receive a follow-up health assessment immediately, and the pen is quarantined for 30 days.

Individual Eligibility

- Pre-release comprehensive health assessment, which includes a full physical exam and collection and banking of biological samples (blood, choanal swab, cloacal swab, nasal lavage) conducted
- Normal behavior for season and time of day
- Normal bodily functions
- No active signs of communicable disease
- Serous 1 nasal and/or ocular discharge **does not disqualify** a tortoise from eligibility if there is no scarring or missing scales around the nares and no other health issues
- No oral lesions
- No white oral cavity
- No bladder stones
- No ectoparasites
- No generalized skin conditions
- Body Condition Score 4-7
- History of maintained or increased weight
- 4 legs and normal ambulation
- No gross disfigurements such as severely flattened carapace, unusually domed or peaked carapace, or grossly enlarged carapace
- Midline carapace length $\leq$ 330 mm

Final approval for release will be given by the DTCC's Conservation Program Specialist or DVM after review of assessments.