Translocation Plan

NORTHEAST BOULDER CITY CONSERVATION EASEMENT

Clark County, Nevada

August 25, 2014

Prepared by

U.S. Fish and Wildlife Service and Clark County Desert Conservation Program

Purpose of translocation: Population Augmentation

Critical Habitat Unit: Piute-Eldorado

Recovery Unit: Eastern Mojave

Recipient site land ownership: Clark County

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

federal: TE-034927-0 (Clark County MSHCP)
FWSDTRO-1 (Roy Averill-Murray, USFWS – Desert Tortoise Recovery Office)

state: S35185 (Allyson Walsh, Desert Tortoise Conservation Center)
S36694 (Edward Koch, USFWS)
To be determined (Clark County)

EA: NV-050-2005-173

BO: 2013-F-0273, 2013-F-0273.AMD1

Dates of proposed translocation: Fall 2014 through 2019

Source of translocatees: Desert Tortoise Conservation Center (2014 only) and locations in the wild within the path of development, Clark County, Nevada

Number of translocatees: up to 115 adults from the DTCC in Fall 2014 (the difference between 115 and the number actually released from the DTCC, up to 10 per year, may be translocated from the wild); up to 115 juveniles from captive and wild sources, subject to need and availability

Translocation Plan Narrative

Site description

The Northeast Boulder City Conservation Easement (BCCE) translocation area occupies approximately 50,850 acres (206 km^2) at the northern end of the Eldorado Valley, south and southwest of the populated portions of Boulder City (Figure 1). The area includes approximately 38,360 acres of Boulder City Conservation Easement lands and 12,458 acres of public lands managed by the BLM Las Vegas Field Office (Forensic Analytical Specialties and Aztec Environmental Consulting 2005). The BCCE land is owned by Boulder City but managed under the 50-year Conservation Easement Grant (1995) established with Clark County in 1995 for the conservation of desert tortoises and other desert wildlife. Boulder City is responsible for permitting activities under city ordinances, and Clark County provides for law enforcement and management of the BCCE.

U.S. Highway 95 forms the western boundary of the translocation area, and Nevada State Highway 165 bounds the southwestern edge. The easement is surrounded on the south, west, and southeast by BLM-administered lands, including the Sloan Canyon National Conservation Area to the west. Lake Mead NRA borders the easement to the east and Boulder City to the north. The translocation area is divided by several unpaved roads that are open for regulated vehicle use, although about 2/3 of all roads across the full BCCE have been closed by signage. The adjacent portions of U.S. 95 and S.R. 165 have been fenced with tortoise-exclusion fencing; the remaining boundaries lack such fencing. There are several designated utility corridors, power lines, and rights of way within the area. Off-highway-vehicle use is restricted to designated roads and trails. A more detailed description of management issues and associated management recommendations within the conservation easement is provided in the management plan (O'Farrell 2009).

The area occurs within the northern end of the Piute-Eldorado Critical Habitat Unit. The land slopes gently towards the Eldorado Dry Lake Bed, and most of the translocation area lies at 1,800–2,500 feet elevation. The majority of the area consists of Mojave Desert scrub ecosystem. Three soil types (Great Groups or suborders; Soil Survey Staff 2013) dominate the translocation area (Figure 2). Lower elevations generally are comprised of soils in the Argid suborder, characterized by clay and, in some cases, sodium components. The mid-elevation alluvial fan is comprised of Calcid soils which contain accumulations of calcium carbonate and higher perennial plant cover than the Argid soils. The more topographically-diverse, actively-eroding uplands contain relatively undeveloped Orthent soils.

The area surrounding the BCCE 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-May and July 2014, with extreme drought conditions (Palmer Drought Severity Index = -4.0 and below) in June 2014 (National Climatic Data Center 2014).

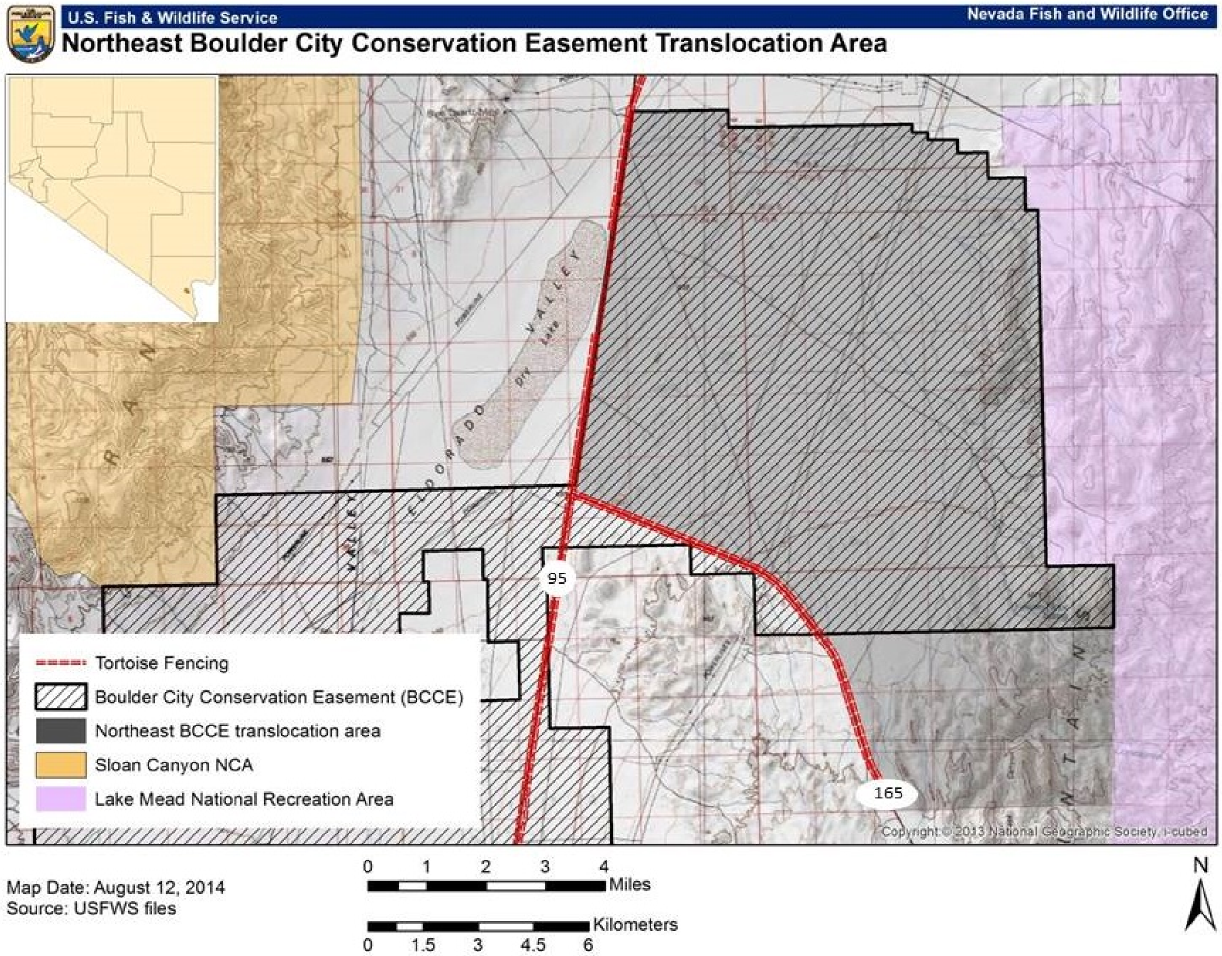

Figure 1. Northeast Boulder City Conservation Easement translocation area.

The decision record for the environmental assessment approving translocation to the BCCE (NV-050-2005-173) included several stipulations that must be met as part of a translocation program to this area, as follows:

1. A management plan for the BCCE must be developed and approved by the USFWS prior to the translocation of desert tortoises to this site. *This stipulation has been completed (O'Farrell 2009).*
2. Desert tortoise translocation must be consistent with the revised Desert Tortoise Recovery Plan (USFWS 2011) as determined by the USFWS's Desert Tortoise Recovery Office. *This translocation plan is consistent with the revised recovery plan.*
3. Prior to the implementation of a desert tortoise translocation program, the County shall address the concerns of the USFWS regarding issues related to genetics and disease. *This stipulation is addressed within this translocation plan (see Health Considerations and Genetic Considerations, below).*
4. To reduce visual impacts, only biodegradable flagging shall be used when marking transects or other locations. *Field workers will comply with this stipulation.*

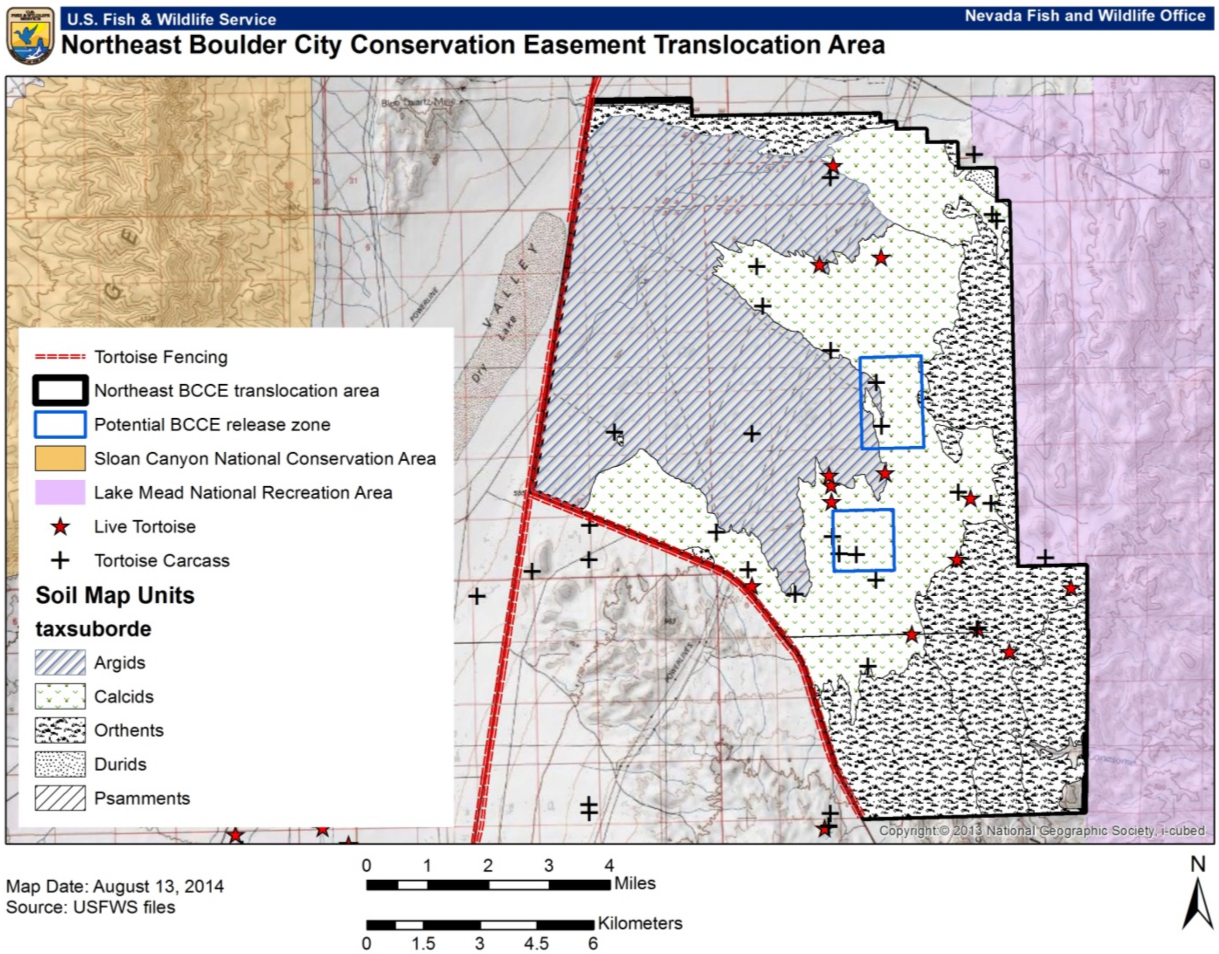

Figure 2. Soil types and potential release zone within the Northeast Boulder City Conservation Easement translocation area.

5. To reduce fugitive dust emissions, researchers and monitors shall not exceed a 25 mph speed limit. *Field workers will comply with this stipulation.*
6. All vehicles and equipment used for translocation, monitoring, and research shall remain on existing roads and trails and only park in existing disturbance. *Field workers will comply with this stipulation by staying on roads designated as "open".*
7. The integrity of tortoise-proof fences associated with translocation sites shall be maintained by implementing a monitoring and maintenance program approved by USFWS. *This action is ongoing.*
8. Surface disturbance created by heavy equipment associated with new fence construction shall be minimized and/or restored. Clark County will be required to implement this action in conjunction with fence construction activities. *Fence construction along U.S. 95 and S.H. 165 has been completed.*

9. All new fence construction will only be allowed during the period between August 30 and February 1 of each year to avoid “take” of migratory birds or their nests. *Fence construction has been completed.*
10. A cultural resource survey and report shall be completed for all new fence construction where a previous cultural clearance cannot be documented. The report shall be approved by the BLM and shall include the survey findings and any necessary mitigation that may be necessary. *Fence construction was completed in 2002 and 2003, prior to the Finding of No Significant Impact.*
11. Prior to translocation, a tortoise survey shall be conducted to obtain baseline data on population density and the existence of disease within the population. *Density surveys have been completed (see Density/Trends of Resident Tortoise Population, below), and baseline health data will be collected in the fall prior to translocation.*
12. Clark County shall ensure that desert tortoise populations are adequately monitored within the translocation site to determine the long-term effect of translocation on both resident and translocated desert tortoises. The researchers shall meet with Clark County, the USFWS, the Nevada Department of Wildlife, and the BLM to report on the monitoring/research program and to determine program direction. *This action is planned (see Monitoring, below).*
13. Section 7 consultation will be completed prior to the use of BLM lands for translocation unless the USFWS makes a determination that consultation is not required (e.g., translocation to the BCCE may be covered under Clark County’s Section 10 permit). *BLM lands are not being used for this translocation, although programmatic section 7 consultation has been completed for population-augmentation activities (2013-F-0273, 2013-F-0273.AMD1).*
14. Clark County shall implement an outreach/public education program to reduce the number of desert tortoises produced in captivity with the goal of reducing the number of pet tortoises picked up through the County’s pick up service to no more than 100 annually within 10 years. *This action is ongoing.*
15. The County shall ensure that a record of all tortoises collected and processed through the County’s pick-up service is maintained. This record shall include minimally the size, gender, and health of individuals tortoises collected, and the origin of each tortoise (i.e., captive, wild, and location from which it came), and its final disposition. *This action is ongoing.*

<u>Selection of release sites</u>

Recent surveys found few tortoises or tortoise sign in the more sparsely vegetated Argid soil types (Figure 2). Therefore, tortoises will be released within the Calcid alluvial fan (e.g., see potential release zones in Figure 2). The goal is to augment the BCCE population (see the Specific Goal of Translocation and Monitoring sections, below, for topics related to different soil types) specifically, by distributing tortoises throughout the site by staying at least 6.5 km from the unfenced northern and southern boundaries. Most desert tortoises are expected to settle within 6.5 km of their release point (USFWS 2012b). Steep topography borders most of the eastern boundary of the translocation area. Specific release points will be selected close to the time of release and will take into account conditions at that time. Designated roads will be used to access release areas, and tortoises will be distributed broadly across the release areas.

Density/Trends of Resident Tortoise Population

The nearest historic population study plot is a 2.6km^2 study plot that was surveyed in 1994 in the Eldorado Valley, approximately 3.2 km south of the McCullough substation and 4.8 km west of U.S. Highway 95 (Goodlett et al. 1994). The 60-person-day survey resulted in 11 encounters of 8 individual tortoises, only 4 of which were $\geq$180 mm midline carapace length (MCL). These limited data provided an abundance estimate of 4 adult tortoises on the plot. In contrast, 19 shell remains were found during the survey, 15 of which were $\geq$180 mm MCL. Three of the individuals were estimated to have died within the 4 previous years. The condition of the environment during and immediately preceding the survey was characterized as drought-stressed.

Before tortoise barrier fencing was installed along U.S. 95, S.R. 164, and S.R. 165 between 2000 and 2003, Hoff and Marlow (2002) documented areas of depletion up to 4 km from these unfenced, heavy traffic-volume roads. Smaller areas of depletion were documented on roads in the valley with lower traffic volumes.

Annual distance sampling surveys conducted within the Eldorado Valley portion of the Piute-Eldorado Valley Critical Habitat Unit between 2004 and 2012 (except in 2006) indicate declining trends in densities of adult desert tortoises, with a current density estimate of 2.8 adult tortoises/km^2 (USFWS, unpubl. data). Between 2004 and 2012, 187 of 309 tortoise detections during range-wide monitoring in Eldorado Valley were of shell remains. This proportion of dead tortoises (0.61) exceeded the average for all other regular monitoring strata in Nevada (range = 0.16-0.42); only Pahrump Valley (0.93 in 2008) and an area north of Mormon Mesa (0.83 in 2008-09) exceeded the proportion of dead tortoises observed in Eldorado Valley (USFWS, unpubl. data).

The tortoise population within Eldorado Valley has suffered a recent decline, warranting the application of population augmentation. 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), although site-specific tortoise survey and soil data suggest variability in habitat suitability within the translocation area (Figure 2). 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 survival of individual translocated tortoises, but inaction could extend indefinitely given the uncertainty of future drought.

Specific Goal of Translocation

Population augmentation is an important tool for conservation of the Mojave desert tortoise (USFWS 2011). The goal for translocation to the BCCE will be to increase the population in this portion of the Eldorado Valley. Little to no information on specific habitat characteristics or measures of habitat quality exists relative to carrying capacity for Mojave desert tortoises (USFWS 2011). Therefore, we will use densities recently observed within the Eldorado Valley portion of the Piute-Eldorado Critical Habitat Unit to set a conservative population-density target. Local densities described by a single standard deviation of the mean tortoise density for the critical habitat unit are not unusually high, so we hope to increase density by up to one standard deviation in the BCCE translocation area. Given appropriate habitat (see below) and tortoise management within the BCCE exist, 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 Eldorado Valley (USFWS 2012b). The upper 68% confidence limit of the density in Eldorado Valley (maximum post-translocation density) is 3.8 adult tortoises/km^2 (USFWS, unpubl. data).

Given the lack of tortoise sign in the Argid soil layer (Figure 2), the potential that this soil type represents unsuitable tortoise habitat in the area, and the possibility that translocated tortoises will not settle in this soil type, we subtracted this area (approximately 17,600 acres [71 km^2]) from the total area within which we expect tortoises to occur. We also subtracted approximately 6,400 acres (26 km^2) of rugged terrain within which we expect few tortoises to disperse. This results in an effective translocation area of approximately 28,400 acres (115 km^2). Therefore, we plan to add up to 115 adult tortoises to the estimated resident population of 322 adult tortoises (see Table for calculations). By keeping augmentation expectations within these limits, a reasonable recovery goal has been set.

Calculation of numbers of adult tortoises that may be released to the Northeast BCCE translocation area (115 km^2).	
Maximum post-translocation abundance	3.8/km^2 * 115 km^2 = 437 adult tortoises
- Current abundance	2.8/km^2 * 115 km^2 = 322 adult tortoises
= Maximum number of new adult tortoises	115 adult tortoises
Planned release	115 adult tortoises

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 (Bjurlin and Bissonette 2004; see also Averill-Murray 2002). 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 $\geq$180 mm carapace length (Turner et al. 1987), so limiting the maximum number of juveniles released to the total number of adults released adds fewer tortoises to the population than would be normally represented in a full size distribution.

Up to 115 adult tortoises may be released to the BCCE translocation area from the resident population at the Desert Tortoise Conservation Center in Fall 2014, subject to these tortoises passing the health screening described below. Within the maximum limit of 115 juvenile tortoises that may be released, a sample of juvenile tortoises ($\leq$20) captively reared at the DTCC may be released in Spring 2015 as part of study conducted by San Diego Zoo Global and U.S. Geological Survey. If fewer than 115 adult and 115 juvenile tortoises from the DTCC are released, the difference in numbers to be translocated to the BCCE will be removed from non-federal lands covered under the Clark County Multi-Species Habitat Conservation Plan (MSHCP). In this case, a maximum of 10 MSHCP tortoises per year will be translocated to the BCCE through 2019.

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 presence of 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. Because populations near this translocation site have undergone declines in abundance due to unknown factors, these protocols screen resident and translocated tortoises for evidence of factors acting to systematically undermine health of either group of tortoises.

<u>Health status of resident tortoise population</u>
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 BCCE area (and higher levels elsewhere in southern Nevada; Sandmeier et al. 2013). This indicates that *M. agassizii* is not unfamiliar to populations in southern Nevada and that inadvertent release of an infected tortoise from the DTCC to the BCCE would not introduce a novel pathogen to the population. Documented presence of *M. agassizii* indicates that extensive disease screening for this pathogen is likely unnecessary (IUCN 2013). In Fall 2014, we will conduct pre-release surveys across the translocation area and complete health assessments according to standardized protocols (USFWS 2013), including collection of biological samples, on each tortoise found. For monitoring comparison purposes, health assessments within the BCCE translocation area will be compared to those from tortoises in control plots established for a separate translocation to the south in Eldorado Valley, which were surveyed in Spring 2014 (Averill-Murray et al. 2014).

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 3). Many 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 usefully may bring out latent infections (IUCN 2013). All captive tortoises to be released will have undergone a quarantine period of ≥90 days with repeated health evaluations (Woodford 2000).

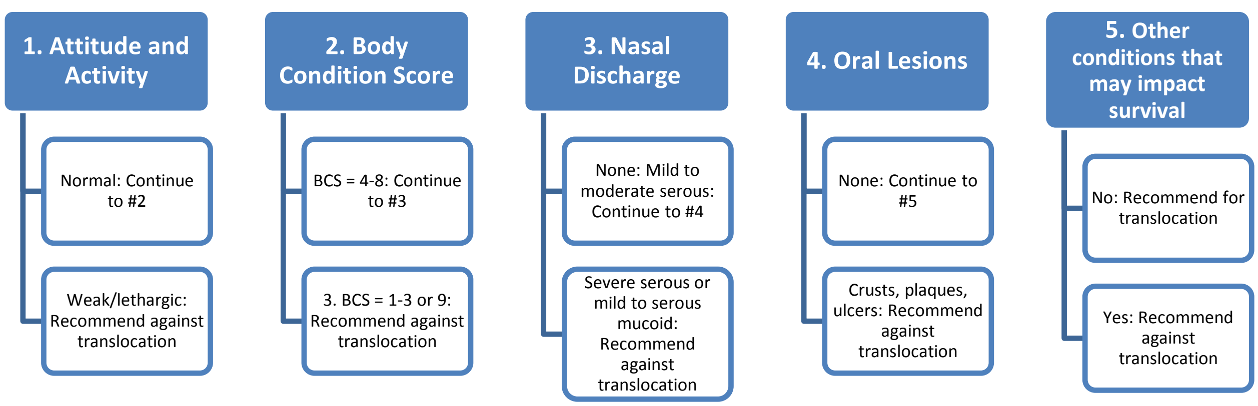

Figure 3. Algorithm for evaluating if desert tortoises are suitable for translocation, taken from USFWS (2013) guidance for wild-to-wild translocation projects. BCS = body condition score.

To address specific conditions that arise from using captive tortoises for population augmentation, additional health-related eligibility criteria will be applied beyond those depicted in Figure 3 (Attachment 1; these criteria may be modified to incorporate new information). For example, individuals housed together in pens will be disqualified collectively. Additional individual criteria to minimize risks to individual translocated tortoises, as well as to the resident population in the BCCE, 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.

Any tortoises translocated to the BCCE from lands covered by Clark County's MSHCP will undergo screening by a qualified biologist according to the most recent USFWS translocation guidance (e.g., USFWS 2012b, 2013; Figure 3). Since tortoises will be translocated to the BCCE from disparate populations throughout the County (as opposed to a contiguous population in Eldorado Valley), all tortoises to be released will undergo an isolation and evaluation period of ≥30 days as a basic disease-prevention precaution (Woodford 2000, IUCN 2013) or will otherwise be evaluated according to the most recent USFWS guidance. Health assessments will be completed at the beginning and end of the evaluation period. This precaution will minimize the chance that transitory signs of illness are missed from a single assessment and that an ill tortoise is inadvertently translocated, especially given the documented prevalence of clinically ill (and seropositive) desert tortoises in proximity to urban areas, and to Las Vegas in particular (Tomlinson and Hardenbrook 1993, Jacobson et al. 1995, Jones 2008). Tortoises that do not pass their health assessments will not be translocated.

Genetic Considerations

The BCCE is located approximately 38 km southeast 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). For example, 95% of samples that were tested against a genetic database that included samples from Nevada were assigned to populations within about 100 km of the DTCC (USFWS 2012a). Similarly, moving tortoises to the BCCE from wild locations within 200 km also maintains historical population genetic structure (Averill-Murray and Hagerty 2014). The entirety of Clark County lies within 200 km of the BCCE, so any tortoise from a wild population within the county may be translocated to the BCCE translocation area.

In addition to the safeguards to negative genetic effects provided by the geographic limits described above, 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 2014). 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 BCCE area and do not successfully integrate into the resident population (Edwards and Berry 2013).

Monitoring

We will conduct surveys over approximately 1000 km of transects across the translocation area during the fall of 2014 to attach radio transmitters to and obtain health assessments from resident tortoises. This level of effort is planned to encounter 40 resident tortoises in the survey area. Associated behavioral observation of transmittered tortoises at a research plot south of Searchlight, Nevada, will be used to adjust the count of observed tortoises to also account for tortoise that were present but were not visible as they were too deep in burrows. The detection pattern of tortoises relative to observers (distance sampling; Buckland et al. 2001) will be used to further increase the estimate of tortoises present by accounting for those that were visible but cryptic and not seen due to distance from the surveyors. All tortoises that are found will be measured, sexed, scored for body condition, and given a permanent mark (numbered paper tag).

Translocations will follow these surveys in Fall 2014, and we expect that some translocated tortoises will disperse into what appears to be lower quality habitat within the translocation area (perhaps about 38%, based roughly on equal dispersal from three of eight sides of the two potential release zones; Figure 2). Given questions related to tortoise use within the habitat/soil types in the translocation area, we will evaluate the behavior and survival consequences to any tortoises that disperse to less-occupied soil types by tracking a sample of 40 adult translocated (from the DTCC in Fall 2014) and 40 resident tortoises with radio telemetry for a minimum of four years. We will compare survival, movements, settling time, home range, and health status between translocated and resident tortoises in relation to soil type. Differences in vegetation communities between soil types may also be characterized. A sample of up to 20 juvenile tortoises may also be radio-tagged, released, and monitored beginning in Spring 2015.

Subsequent monitoring (and methodology) will be determined upon evaluation of results from the initial four-year period. Such monitoring may include more intensive effort applied in this area as part of the long-term, range-wide monitoring program (USFWS 2014) or as part of an ongoing project studying the effects on tortoise occupancy of anthropogenic and natural factors (Enduring Conservation Outcomes 2011). 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.

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Attachment 1

Health Eligibility Criteria
Fall 2014 Translocation from DTCC to the BCCE 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.

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.