

Translocation Plan
GREATER TROUT CANYON AREA

Clark County, Nevada

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Purpose of translocation: Population Augmentation, Research

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)
BO: 1-5-00-FW-446 and 2013-F-0273

Date of proposed translocation: Spring/Fall 2013; Spring 2014 (potential)

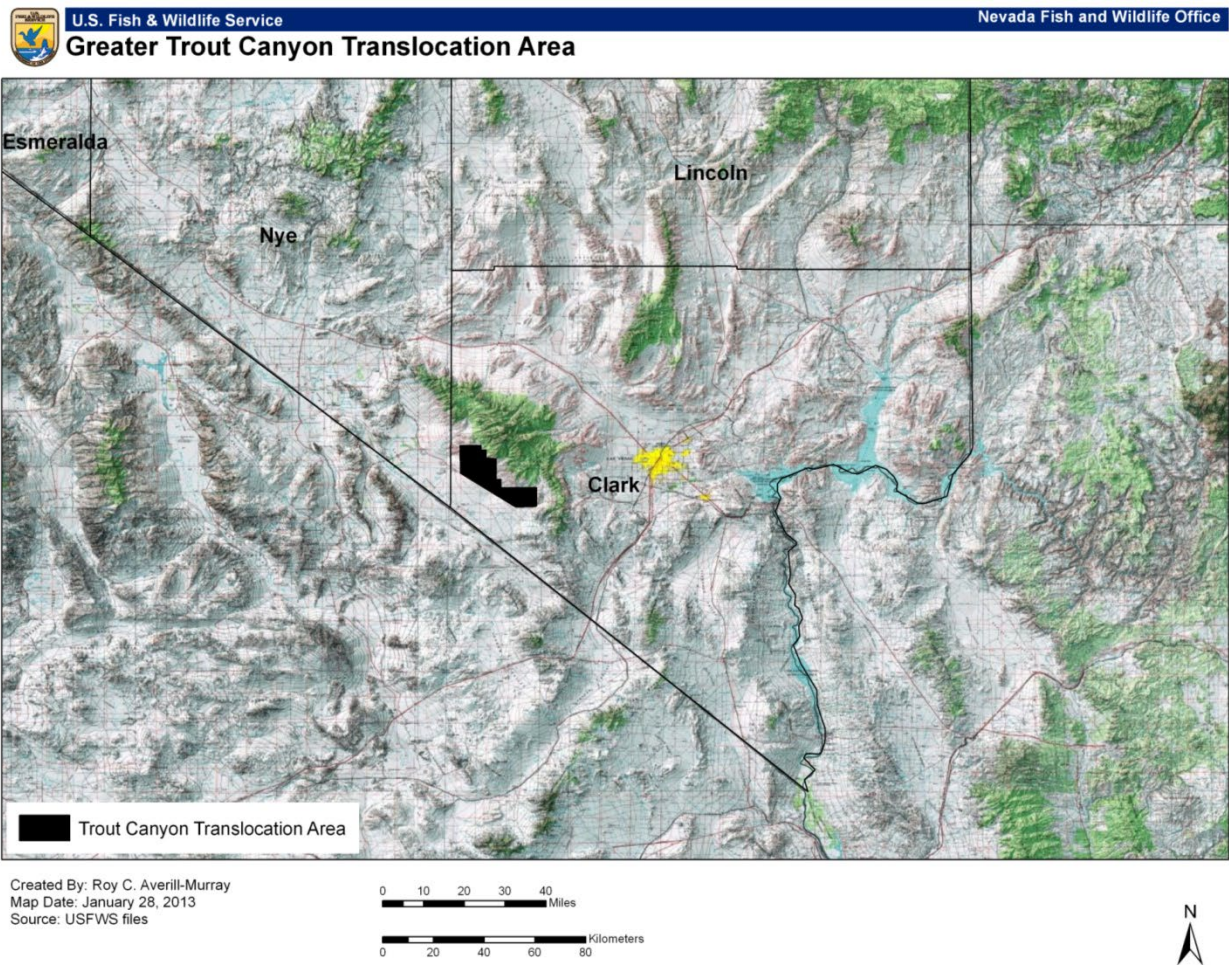
Source of translocatees: Desert Tortoise Conservation Center, Clark County, Nevada

Number of translocatees: Up to 400 adults, 400 juveniles

Translocation Plan Narrative

Site description

The Greater Trout Canyon translocation site encompasses approximately 59,000 acres (239 km²) of public lands managed by the BLM (Map 1) within Clark County, Nevada. The site is located on the southwestern bajada of the Spring Mountains near Pahrump, Nevada, with the southern boundary formed by State Route 160. The northern, eastern, and western limits of the site are open to adjacent land, with the 1,250-meter elevation line in the Spring Mountains generally forming the northern limit, the border between BLM and Forest Service land forming the eastern limit, and the western limit running North-South approximately 2 miles east of the Clark County line. There are approximately 556 acres of private land within the boundaries. The 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 (USFWS 2012a).



Map 1. Greater Trout Canyon Translocation Area in relation to southern Nevada.

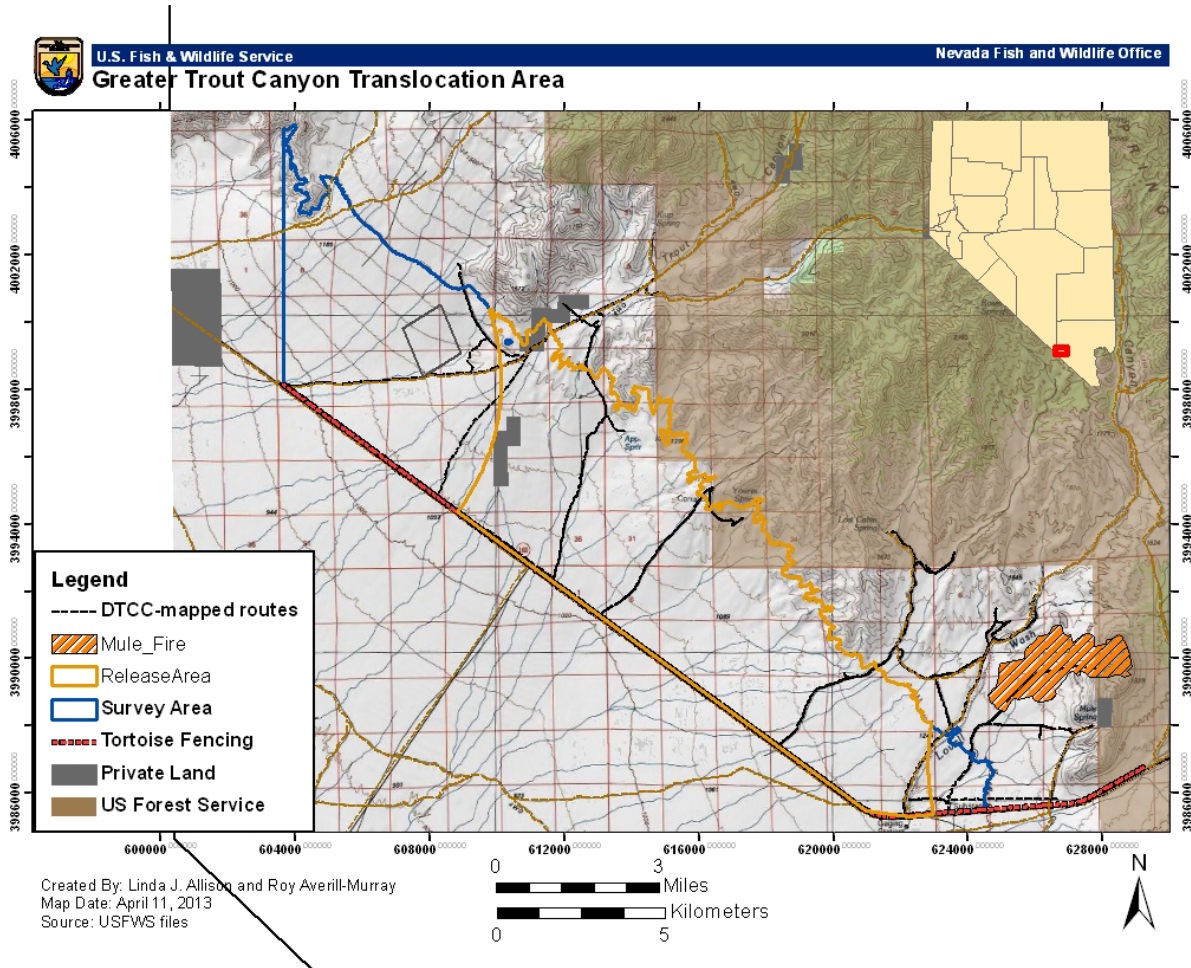
Two power lines cross the site: the Valley Electric line, which services Pahrump, and a power/telephone line that follows the Trout Canyon road to the small Trout Canyon community within the Humboldt-Toiyabe National Forest (Forensic Analytical Specialties and Aztec Environmental Consulting 2005). There are no utility corridors or any proposals to dispose of public lands within this site. There are 335 acres of private land that are open for development. Though none of the land has been developed, the BLM has received an application for an access road to service a portion of the private land from State Route 160. The applicant intends to sell five-acre home sites. With the development of these lands, we anticipate an increase in mortality of tortoises from traffic and increased recreational use of adjoining public lands.

Aside from State Route 160, which forms the southern border of the site, there are no paved roads within the expected dispersal area of the tortoises. An approximately 19-mi (30.5-km) stretch of State Route 160 is fenced with tortoise-exclusion fencing. There are several unpaved roads that go from State Route 160 up the bajadas to the northeast and into canyons in the Spring Mountains. The most well-traveled of these roads is the road to Trout Canyon, which also passes by several private inholdings.

The Greater Trout Canyon site lies within the Wheeler Pass Herd Management Area. Most horses and burros occur northwest of the site, but at least some of them can be expected to use the area (Forensic Analytical Specialties and Aztec Environmental Consulting 2005). Horses and burros are known to use both Appaloosa and Yount Springs, which are both located on US Forest Service lands immediately adjacent to the site's 1250-meter contour. The Wheeler Wash grazing allotment overlaps the northern 1/3 of the translocation site. Though this allotment has not been active since 1998, it could be re-activated by the permit holder at any time. Off-highway-vehicle use within the area is restricted to designated roads and trails. While casual use and competitive speed and non-speed events are allowable, BLM has yet to receive an application for any speed events in this area. It appears that several fires have affected the vicinity, but the most recent is the Mule Burn from August 1997; this 1,300-acre (5 km²) burn lies outside of the 1,250-meter boundary of the site (Map 2).

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.

Specific release points are selected close to the time of release and take into account conditions at that time. The goal is to spread tortoises throughout the site while staying at least 6.5 km from identified hazards (e.g., unfenced ends of State Route 160) that are not otherwise bounded by topographic features or other hindrances to tortoise dispersal. The available 4WD roads are used to access different portions of the bajada, and tortoises will continue to be distributed broadly rather than released within one localized area.



Map 2. Greater Trout Canyon Translocation Area.

Density/Trends of Resident Tortoise Population

A 1-mi² (2.6-km²) study plot was surveyed within the Trout Canyon area in 1987 and 1992 (Hardenbrook, undated; Holle et al. 1992). In 1987, 31 tortoises were captured at least once (24 >180mm carapace length), and estimated adult abundance was 30 ± 25 (2 SE; = 11.6/km²) (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 ± 8.6 (= 7.3/km²) (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.

Surveys were conducted southeast of Pahrump, Nevada, during the 2008 range-wide monitoring season between 19 and 29 May (USFWS 2012b). Field workers surveyed 75 transects totaling 847 km in the area that includes the Greater Trout Canyon site. Estimated density was 2.9 adult tortoises per km² (CV = 43.9), which is near the lower 95% confidence limit of the mean density for the Eastern Mojave Recovery Unit, within which this site lies

(USFWS 2012c). 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). Thirteen full or partial transects were walked within the boundaries of the Greater Trout Canyon translocation site, and only 2 of 16 tortoise detections were of live animals (7.0 dead:live compared to 0.50 dead:live outside the Greater Trout Canyon area).

In April 2013, prior to the initial release, transects were walked in an approximately 25 km² area in the southeastern portion of the site. Twenty-two live tortoises and 24 tortoise remains were found.

It is apparent that the local tortoise population in the Trout Canyon area has suffered a decline in the moderate past, warranting the use of population augmentation for further investigation.

Specific Goal of Translocation

Population augmentation

The primary goal for translocation to the Greater Trout Canyon 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. Densities described by a single standard deviation of the mean tortoise density for a recovery unit are not unusually high. Therefore, assuming appropriate habitat and management exist, maximum post-translocation density of adult tortoises should not exceed the 68% confidence interval of the mean density (this is an asymmetrical interval based on one standard deviation to each side of the mean) in the respective recovery unit (USFWS 2012c). For the Eastern Mojave Recovery Unit, this density is 5.77 adult tortoise/km². Therefore, up to 686 adult tortoises may be released within the translocation area (see Table). The dead:live ratio of tortoises observed in the Greater Trout Canyon area in 2008 suggests that the current density actually may be much lower than estimated across the larger southern Pahrump Valley; therefore, a release within the maximum limit of 686 adult tortoises further buffers against introducing an unsustainable number to the area. Specific limits have not been set for juvenile tortoises, but this number should not exceed the number of adults released.

Calculation of numbers of adult tortoises that may be released to the Trout Canyon translocation site (239 km²).	
Maximum post-translocation abundance	$5.77/\text{km}^2 * 239 \text{ km}^2 = 1379$ adult tortoises
- Current abundance	$2.9/\text{km}^2 * 239 \text{ km}^2 = 693$ adult tortoises
= Maximum number of new adult tortoises	686 adult tortoises
Planned release	~400 adult tortoises + ~400 juvenile tortoises
Estimated post-translocation density	$(693 + 400)/239 \text{ km}^2 = 4.57$ adults/km ²

*The number of juveniles resident at the translocation site is unknown. Even if 400 juveniles were released as part of the translocation and assessed for their impact as if they were adults, the density would remain below the threshold density of $5.77/\text{km}^2$ $(693 + 400 + 400)/239 \text{ km}^2 = 5.09$ adults and translocated juveniles/ km^2 .

Spring 2013 Update: In spring 2013, a total of 215 tortoises (45 females, 52 males, 118 juveniles [<180 mm carapace length]) were released to the site. This number includes those released for the research described below. Additional releases, within the limits established above, will take place in fall 2013. A final release may take place in spring 2014 if necessary to achieve the targeted number of translocated adult tortoises.

Research

The research addresses two areas of interest: 1) effects of *Mycoplasma agassizii* (MyAg) ELISA status on survival, health, and movement post-release and 2) effects of vegetation density and diversity within the release area on post-release movements. A subset of the released tortoises will be monitored closely for this research. Specifically, we will be following via radio telemetry translocated healthy tortoises, with and without antibodies to *M. agassizii*, as well as resident tortoises to look for differences in survivorship and health status among groups.

H_0 (MyAg): The presence of antibodies to *Mycoplasma agassizii*, as detected through an ELISA test, does not affect post-release health, movement, and/or survival of translocated desert tortoises as compared to those without detectable antibodies.

H_1 (MyAg): The presence of antibodies to *Mycoplasma agassizii*, as detected through an ELISA test, affects post-release health, movement, and/or survival of translocated desert tortoises as compared to those without detectable antibodies.

H_0 (habitat): Release into areas of higher vegetation density and diversity does not affect post-release movements and dispersal from release areas.

H_1 (habitat): Release into areas of higher vegetation density and diversity does affect post-release movements and dispersal from release areas.

This research is a step in testing our assumption that an evaluation of health based on clinical signs of disease and body condition score within 30 days of release is more appropriate than making release eligibility decisions based on MyAg ELISA titers. Due to the longevity of this species and the fact that upper respiratory tract disease caused by *M. agassizii* is endemic in free-living tortoise populations in the Mojave Desert, we further hypothesize that translocated and resident tortoises will exhibit clinical signs consistent with this infection from time to time and that these signs will wax and wane in severity. We aim to determine if MyAg ELISA status upon release can be used to predict which tortoises will develop clinical signs of upper respiratory tract disease and/or whether the detection of antibodies to this common etiologic agent will affect survivorship. It should be noted that the presence of antibodies does not confer protection against disease caused by this pathogen, rather it is an indication of exposure. While MyAg is the agent of primary interest, *Mycoplasma testudineum* (MyTe) has

more recently been described as a pathogen of desert tortoises. We include ELISA testing for MyTe antibodies.

Thirty-two animals were selected from the DTCC's collection for the study. The MyAg ELISA-positive and ELISA-negative study groups each consisted of 8 males and 8 gravid (confirmed through ultrasound and digital radiography) females. All 32 animals were ELISA-negative for *M. testudineum*. Twelve male and 8 female adult resident tortoises were also selected for the study, to evaluate corresponding health status in the resident tortoise population and make comparisons with the translocatees. The health assessment and diagnostics used in this study are those developed by San Diego Zoo Global veterinarians in conjunction with other consulting veterinarians, scientists, and biologists for use by the USFWS DTRO (USFWS 2013). These protocols have been adapted from published recommendations (Berry and Christopher 2001) and IUCN guidelines (Woodford 2000). Diagnostic tests will include: blood collection for *M. agassizii*/*M. testudineum* ELISA (University of Florida), oral swabs for PCR detection of *M. agassizii*/*M. testudineum* and herpesvirus, and oral/cloacal swabs for PCR detection of *Chlamydomphila* spp. In addition to the standard health assessment, which includes physical examination and determination of a body condition score (BCS), we will also be collecting data to calculate condition indices (CI) (Nagy et al. 2002) for the research animals through time.

Spring 2013 Update: These 32 tortoises were released on May 1, 2013. The translocatees were all released in washes to help promote earlier settling and less dispersal (Germano et al. 2012) and were split evenly between sex and antibody status into areas that had relatively higher and lower vegetation density and diversity based on surveys carried out by UNLV.

Health Considerations

Health status of resident tortoise population

The low number of tortoises within the Greater Trout Canyon translocation area precludes the need for intensive health sampling of the resident population. Too few tortoises exist to create a health risk by adding new individuals to the population. However, prior to translocation in spring 2013, a preliminary survey was done that included conducting health assessments and collecting biological samples (blood, oral, and cloacal swabs) for serologic testing and molecular diagnostics from 22 resident tortoises (Table 1). There were no indications of active transmissible disease processes within the group examined.

Health status of translocatees

All tortoises to be translocated were 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 the comprehensive physical exam and sample collection protocols were developed by San Diego Zoo Global veterinarians in conjunction with other consulting veterinarians, scientists, and biologists (see Attachment 1 for health related eligibility criteria). These protocols have been adapted from published recommendations (Berry and Christopher 2001) and IUCN guidelines (Woodford 2000). Health-history documentation of all release candidates were evaluated, and all release candidates were assessed visually at least 2-4 times prior to release

(Table 2). 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 passed the DTCC's comprehensive health screening were released.

Genetic Considerations

The Greater Trout Canyon translocation area is located approximately 50 km northwest of the DTCC. Moving tortoises within 175 km of the DTCC ensures that the vast majority of 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. Genetic analysis of individuals as a means of selecting tortoises to be translocated is unnecessary. However, several tortoises at the DTCC were brought there from the Pahrump area, and they will be prioritized for release within the Greater Trout Canyon area.

Monitoring

Population augmentation

We will use survivorship and health of translocatees and of residents to describe the success of the translocation. Survivorship will be measured using mark-recapture surveys. All translocatees will be marked prior to release; in addition, all residents encountered will be given a permanent mark. In year 0 of the study (i.e., prior to or at the time of release), if sufficient residents are marked, we can plan to compare survivorship of translocatees to that of residents. Otherwise, our surveys will allow us to describe annual survivorship trends in translocatees starting in year 0 and to assess long-term differences between translocatees and original residents starting in year 1 (assuming that sufficient numbers of residents are encountered and marked). The intent of the monitoring design is to provide an adequate first-, second-, and fifth-year set of resightings to provide information for later surveys.

We plan to complete 3000 linear km of transects in each annual survey (i.e., 1, 2, and 5 years post-translocation). The general layout will comprise 150 20-km transects originating along State Route 160. Surveyors will use a GPS unit to walk strip transects, starting after the first week of April. The transects will be walked in a north-south orientation between State Route 160 and the Spring Mountains, keeping transects below 1250m elevation. The exact distance traversed will vary accordingly to account for irregular study area dimensions. Most of these transects will be 20 km long, or 2 days of effort. All tortoises that are found will be measured, sexed, scored for body condition, and given a permanent mark (numbered paper tag and matching marginal scute notching).

Research

Transmittered tortoises are tracked daily for the first 10 days post-release. After this we decrease the tracking frequency to 2-3 times per week until animals have begun to show signs of settling (e.g., use or creation of burrows, less movement, etc.). We will continue to monitor all animals (resident and translocated) a minimum of once per week during the active season

and once every other week during the inactive season. This will continue for at least one year post-release.

All animals received an initial health assessment (t=0) and have biological samples collected for diagnostic tests. These health checks will be repeated at 1, 5, and 12 months post-release. Any animal that is recovered dead will receive a necropsy. The extent of the necropsy will depend on the carcass condition (state of autolysis). The initial health assessment protocol and the assessments carried out at 1, 5, and 12 months will involve a comprehensive physical examination. Additionally, every month during the active season, we will attempt to determine whether or not the animal is showing clinical signs most associated with URTD (nasal discharge and periocular swelling) as well as determine BCS.

Vegetation monitoring: site-wide

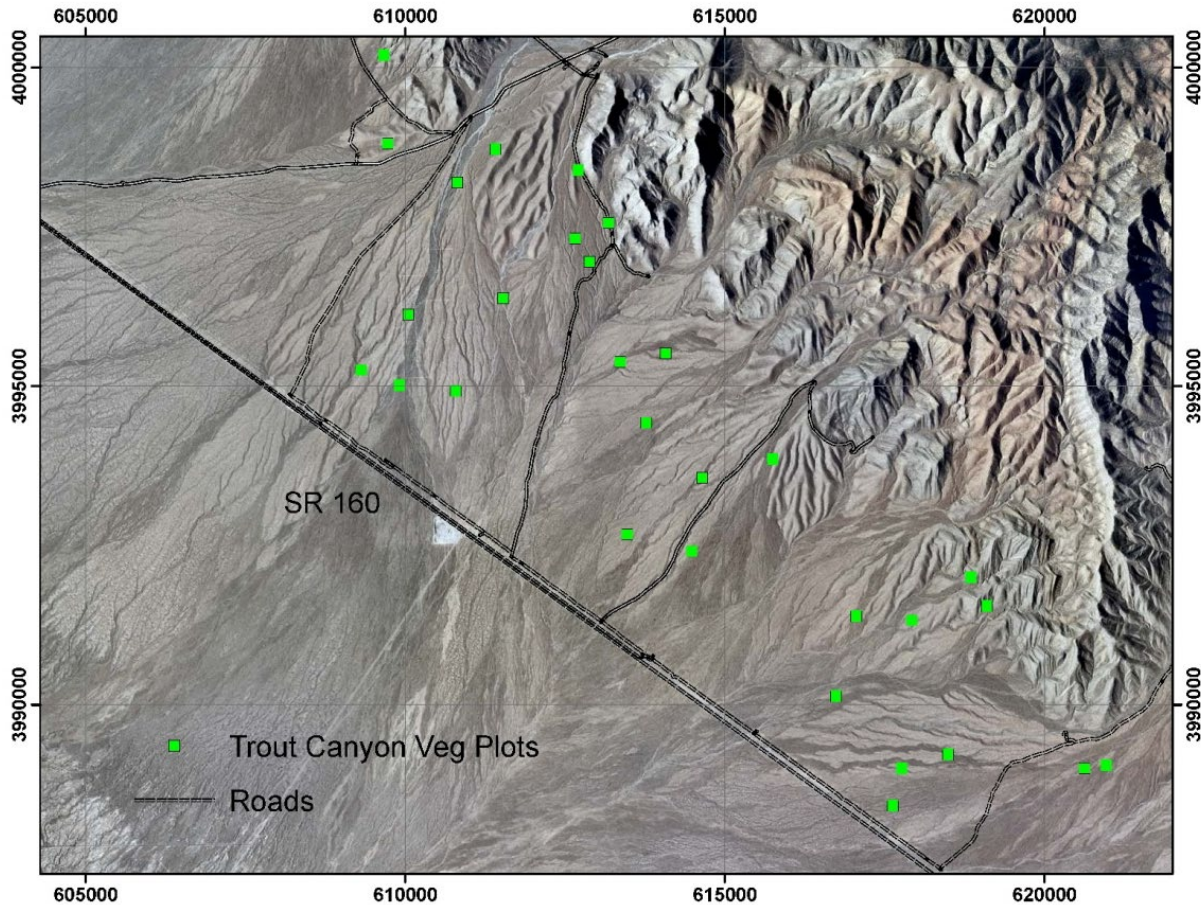
Employees of the Applied Ecology Research Group at the University of Nevada, Las Vegas, will aid Desert Tortoise Conservation Center staff and the US Fish and Wildlife Service by providing vegetation monitoring and desert tortoise forage surveys throughout the translocation sites in the Trout Canyon area. These main goals of these surveys are designed to provide long-term (five-year) data on the vegetation composition and stature, with a special focus on species that serve as important food sources for desert tortoises. Plots will be monitored annually from 2013 to 2018 with the goal of correlating vegetation and climatic variation (which can be extreme in the eastern Mojave Desert) with observations of tortoise health and survival status post-translocation. We will collect data on plant species composition and abundance which can be correlated with distribution and health metrics for monitored tortoise individuals.

We established 30, 10m x 10m (100m²) plots at points randomly distributed throughout the translocation site (30 plots total; Map 3). Random points were derived using the “AlaskaPak” toolkit random point generator in ArcGIS v. 9.3. All plots avoid unique topographical structures, such as washes or cliffs, with the intent of collecting data that reflect the general environment within which the tortoises are interacting most often.

Within each plot, we will record cover of all species present in the 100m² plots (visually estimated to the nearest 1%) and we will establish nine 1m² subplots evenly distributed throughout the plots within which we will record density of all seedlings and annual plants present. Sampling from these subplots will provide finer resolution vegetation data for small annual species that are important for tortoise forage. Due to great environmental stochasticity in Mojave Desert systems, annual plant community composition and density vary greatly from year to year. Therefore, data should be collected annually for 5 years to accurately relate vegetation with health metrics and survival.

All plots will be sampled at the time of peak biomass for annual species, generally April – June, to accurately identify annual plant species which may consist of a large portion of desert tortoise diet and therefore allow researchers to better predict or explain tortoise health. The composition of annual plant species in the Mojave Desert varies greatly year to year with

climatic oscillations. Therefore, annual vegetation surveys are suggested in order to best explain patterns in tortoise health parameters through time.

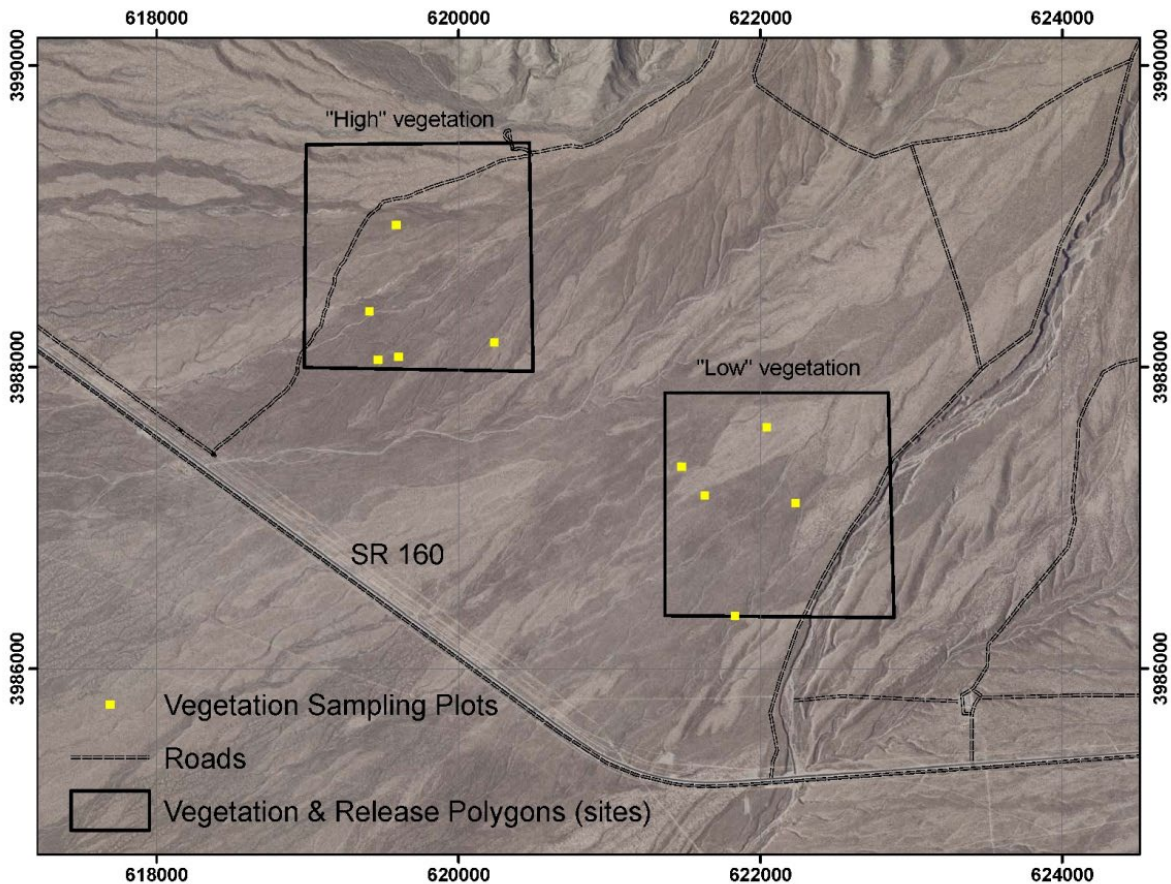


Map 3. Locations for 30 vegetation plots across the Trout Canyon release site. Plots were randomly distributed to capture vegetative diversity across the site. Map grid is in UTMs, NAD 83, Zone 11.

Vegetation monitoring: research release area

Secondarily in 2013, two release sites for telemetered animals that differ in vegetation density and composition were selected based on previous site observations. Sites must fit the requirements of easy accessibility for tortoise translocations (road access to associated washes for releasing), at least 1 km from a paved road (State Highway 160), and less than 1250m elevation. Polygons of 2.25 km² were created for each vegetation state, one for a “high” density vegetation (greater shrub density and diversity) and one for a lower (“low”) density vegetation site. Sites were chosen based on institutional knowledge and field scouting to detect areas of differing flora. Differences in floristic composition may result largely from site history, including intermittent wildfire, which may have occurred more recently throughout the “low” vegetation sites.

We established 5, 10m x 10m (100m²) plots at points randomly distributed throughout each the high and low vegetation sites (10 plots total; Map 4). Random points were derived using the “AlaskaPak” toolkit random point generator in ArcGIS v. 9.3. All plots avoid unique topographical structures, such as washes or cliffs, with the intent of collecting data that reflect the general environment within which the tortoises are interacting most often.



Map 4. Vegetation plot sample locations within “high” and “low” vegetation density sites for ELISA status release study. Yellow squares represent sampling locations. Map grid is in UTMs, NAD 83, Zone 11.

Data from the first year of sampling will confirm and elucidate the differences among the “high” and “low” density sites. We will examine plant species richness and diversity, the degree to which sites group in multivariate space (similarity among plots within each group), and which species or differences in abundances of species indicate “high” versus “low” sites for use in field categorizations for field technicians. In addition to descriptive statistics, we will perform NMS (non-metric multidimensional scaling) ordination analyses with MRPP (multiple response permutation procedures) to determine if sites are statistically different from each other, indicator species analyses to examine if certain species have greater (or exclusive) fidelity with

either “high” or “low” sites, and we will use classification trees to produce a guide for field technicians for classifying sites where the observe tortoises as “high” or “low” density/diversity vegetation sites.

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Table 1. Health Assessment Summary Table: Residents

Tortoise ID	Sex	MCL mm	Mass g	Attitude	BCS	Nasal Discharge	Discharge Severity	Oral Lesions	Other Defect	MyAg Titer	MyTe Titer
1	M	242	2930	Normal	5	None	0	None	Canid trauma- exposed bone supracaudal, nuchal missing, exposed bone RM1, LM1 and gular	Not Shipped Yet	Not Shipped Yet
2	M	269	3950	Normal	5	None	0	None	Canid trauma first marginal and gular, missing scales left hind limb	<32	<32
3	F	237	2630	Normal	5	None	0	None	Sunken scutes, split first marginal	<32	32
4	M	283	4320	Normal	5	None	0	None	Peeling carapace, exposed bone LM10	<32	64
6	M	294	4380	Normal	5	None	0	None	Trauma and exposed bone to carapace- RM4-5 splits and pinched, RC3-4 suture exposed bone, V5 split, LM9 flared, LM10 crushed in	<32	32
7	F	207	1440	Normal	5	None	0	None	Peeling plastron, exposed bone LM1 and gular	<32	128
8	M	299	4440	Normal	5	None	0	None	None	<32	<32
9	F	247	2930	Normal	4	None	0	None	Sunken scutes, gular chipped	<32	32
10	M	266	3460	Normal	3	No Exam	No Exam	No Exam	Sunken scutes	No Exam	No Exam
11	F	222	2070	Normal	4	None	0	None	None	<32	32
12	M	260	3630	Normal	5	None	0	None	Sunken scutes, chipped LM1, RC3, RM9 and bridge on plastron, two worn nubbed toenails on right hind limb, worn and curved gular	<32	64
13	M	192	1440	Normal	5	None	0	No Exam	Peeling plastron	<32	32
14	F	231	2480	Normal	4	None	0	None	None	<32	<32
15	M	214	2160	Normal	3	None	0	None	Exposed bone nuchal and RM8, puncture RC4, gular and pectorals chipped, sunken scutes	<32	<32
16	M	247	3170	Normal	4	None	0	None	Gular chipped	<32	<32
17	M	242	2910	Normal	5	None	0	No Exam	Sunken scutes, peeling plastron, chipping between gular and humerals	<32	<32
18	F	273	3750	Normal	4	None	0	None	Minor chipping rear marginals	<32	64
19	M	270	3710	Normal	5	None	0	None	Exposed bone RC4	Not Shipped Yet	Not Shipped Yet
21	F	226	2300	Normal	5	None	0	None	Missing 3 scales on right forelimb, chip on gular	<32	<32
23	F	180	1370	Normal	5	None	0	None	Peeling and worn carapace, Canid trama-exposed bone scutes and sutures LM1-4, nuchal mostly missing, chips RM1-4 and RC4, bite marks on gular and pectorals, peeling plastron	<32	64

Table 2. Health Assessment Summary Table: Translocatees To Be Tracked Using Radio Telemetry

Tortoise DTCC ID	Trout Canyon ID	Sex	MCL mm	Mass g (without transmitter)	Attitude	BCS	Nasal Discharge	Discharge Severity	Oral Lesions	Other Defect	MyAg Titer	MyTe Titer
13467	GT3099	M	279	4540	Normal	4	None	0	None	None	<32	32
13486	GT3098	M	267	3472	Normal	4	None	0	None	None	<32	<32
13490	GT3104	M	286	4108	Normal	5	None	0	None	None	<32	<32
14110	GT3103	M	272	4137	Normal	4	None	0	None	L/R nares: occluded with food (removed). Mass is an egg.	<32	32
14562	GT3127	F	249	2979	Normal	4	None	0	None	L nare occluded with dirt.	<32	32
15094	GT3097	M	277	4449	Normal	4	None	0	None	None	<32	<32
15163	GT3108	F	269	3293	Normal	4	None	0	None	None	64	32
17514	GT3122	F	259	3658	Normal	4	None	0	None	R nare missing scales 25-50%. Small mass on right side.	>512	32
17803	GT3102	M	301	5145	Normal	4	None	0	None	None	<32	<32
17987	GT3100	M	284	3898	Normal	4	None	0	None	None	<32	32
18146	GT3113	F	291	4505	Normal	4	None	0	None	L nare: missing scales <25%. L mass = eggs.	<32	<32
18171	GT3105	M	280	4167	Normal	5	None	0	None	None	128	32
18196	GT3120	F	270	3558	Normal	5	None	0	None	None	128	32
18490	GT3125	F	209	1982	Normal	4	None	0	None	L mass is egg.	<32	<32
18875	GT3124	F	231	2176	Normal	4	None	0	None	None	<32	<32
18973	GT3128	F	232	2454	Normal	4	None	0	None	1 tick in right nare.	<32	<32
19194	GT3130	F	282	4543	Normal	4	None	0	None	None	<32	32
19402	GT3116	F	262	3252	Normal	5	None	0	None	None	64	<32
19825	GT3107	M	247	2707	Normal	4	None	0	None	None	128	<32
20433	GT3119	F	246	2796	Normal	5	None	0	None	L/R nares: missing scales/eroded 25-50%.	<32	<32
20435	GT3106	M	180	1176	Normal	4	None	0	None	Shell damage RC2, RC3, RM4, RM5, RM6	<32	32
20552	GT3129	F	286	4172	Normal	4	None	0	None	None	<32	32
20810	GT3118	F	281	4206	Normal	4	None	0	None	Oral cavity very pale need to recheck before release. Oral cavity checked and tortoise approved for release.	256	32
20814	GT3126	F	231	2590	Normal	5	None	0	None	None	256	32
20816	GT3109	M	215	2071	Normal	5	None	0	None	None	256	<32
20817	GT3123	F	232	2554	Normal	5	None	0	None	None	128	<32
21094	GT3132	F	266	2997	Normal	4	None	0	None	None	128	32
21095	GT3101	M	248	2826	Normal	4	None	0	None	None	>512	32
21138	GT3121	M	298	4147	Normal	5	None	0	None	L nare: missing scales <25%.	256	<32
21896	GT3114	M	271	3200	Normal	5	None	0	None	R nare: missing scales 25-50%.	>512	32
21929	GT3115	M	297	4519	Normal	4	None	0	None	None	128	<32
21934	GT3117	M	209	1638	Normal	4	None	0	None	None	128	<32

Table 3. Health Assessment Summary Table: Translocatees For Management Translocations (Not Radio Tracked)

DTCC ID	Trout Canyon ID	Sex	MCL mm	Mass g	Attitude	BCS	Nasal Discharge	Discharge Severity	Oral Lesions	Other Defect	MyAg Sample Date	MyAg Titer	MyTe Titer
5786	GT3157	F	222	2295	Normal	5	None	0	None	L/R nares: missing scales <25%.	17-Apr-13	<32	Pending
13488	GT3155	F	269	3558	Normal	4	None	0	None	2 extra vertebral scutes.	09-Apr-13	<32	Pending
13499	GT3151	M	257	3609	Normal	4	None	0	None		21-Apr-13	<32	Pending
13970	GT3066	F	229	2004	Normal	4	None	0	None	L/R nares: partially occluded.	13-Oct-09	<32	Pending
15815	GT3061	M	260	3482	Normal	4	None	0	None	missing gular. LM8-9 large hole. RM4-7 exposed bone - burn? RM8 - exposed bone - burn?	16-Jun-10	>256	Pending
16786	GT3224	U	159	754	Normal	4	None	0	Not Examined		09-Oct-09	32	Pending
16787	GT3223	U	159	758	Normal	5	None	0	None	missing scales <25%.	09-Oct-09	<32	Pending
17110	GT3148	F	243	2809	Normal	4	None	0	None	Multiple shelled eggs.	27-Jul-09	256	Pending
17236	GT3172	M	258	2969	Normal	4	Yes	Serous 1	None		22-Apr-13	<32	Pending
17409	GT3209	U	169	957	Normal	5	None	0	None		02-Aug-09	<32	Pending
17410	GT3212	U	124	327	Normal	4	None	0	None		17-Sep-09	<32	Pending
17413	GT3210	U	118	295	Normal	4	None	0	None		17-Sep-09	<32	Pending
17415	GT3213	U	107	245	Normal	4	None	0	None		17-Sep-09	<32	Pending
17436	GT3222	F	227	2080	Normal	4	None	0	None		18-Aug-09	<32	Pending
17437	GT3196	M	236	2113	Normal	5	None	0	None	Left nare missing scales >25%.	18-Aug-09	<32	Pending
17550	GT3206	U	105	238	Normal	4	None	0	None		26-May-09	<32	Pending
17582	GT3160	F	238	2360	Normal	4	None	0	None	L mass is confirmed eggs on x-ray.	17-Apr-13	<32	Pending
17588	GT3169	F	249	2805	Normal	4	None	0	None		17-Apr-13	<32	Pending
17596	GT3167	M	247	3329	Normal	5	None	0	None				Pending
17895	GT3152	F	233	2282	Normal	4	None	0	None		09-Apr-13	64	Pending
17907	GT3198	M	263	3842	Normal	4	None	0	None		27-Aug-09	<32	Pending
17984	GT3165	F	269	3540	Normal	4	None	0	None		09-Aug-09	<32	Pending
17988	GT3154	F	280	3224	Normal	4	None	0	None		16-Apr-13	128	Pending
18056	GT3229	F	282	4394	Normal	4	None	0	None	Mass is eggs.	14-Sep-09	32	Pending
18290	GT3163	M	246	2623	Normal	4	None	0	None		29-Sep-09	<32	Pending
18412	GT3161	M	282	4199	Normal	4	None	0	None	Left nare: occluded with food.	15-Oct-09	<32	Pending
18633	GT3150	F	250	2802	Normal	4	None	0	None		17-Apr-13	>512	Pending
18659	GT3193	F	284	4508	Normal	4	None	0	None	Masses are eggs - ok.	07-Jul-10	>512	Pending
18683	GT3028	U	121	302	Normal	5	None	0	None		29-Jun-10	<32	Pending
18719	GT3014	U	88	131	Normal	4	None	0	Not Examined		01-Jun-12	<32	Pending
18744	GT3214	U	137	504	Normal	4	None	0	None		22-Jun-10	<32	Pending
18784	GT3181	U	91	140	Normal	4	None	0	None	nares partially occluded.	01-Jun-12	<32	Pending
18820	GT3144	M	295	4767	Normal	4	Yes	Serous 1	None		22-Apr-13	32	Pending

18930	GT3179	U	183	1135	Normal	4	Yes	Serous 1	None	missing scales 25-50%.	08-Jul-10	<32	Pending
18983	GT3180	U	97	171	Normal	4	None	0	None		28-May-12	<32	Pending
19110	GT5929	F	244	2692	Normal	4	None	0	None	Missing scales 25-50%.	09-Apr-13	<32	Pending
19143	GT3211	U	149	669	Normal	5	None	0	None		17-Jun-10	<32	Pending
19275	GT3166	F	238	2517	Normal	4	None	0	None		26-Jul-10	32	Pending
19288	GT3175	U	122	331	Normal	4	None	0	None		26-Jul-10	<32	Pending
19307	GT3203	U	109	266	Normal	5	None	0	None	Right nare partially occluded.	28-Jul-10	<32	Pending
19315	GT3174	U	167	931	Normal	5	None	0	Not Examined		01-Aug-10	<32	Pending
19343	GT3147	F	283	3657	Normal	5	None	0	None		10-Apr-13	<32	Pending
19345	GT3171	M	219	1858	Normal	4	None	0	None		21-Apr-13	<32	Pending
19401	GT3156	F	278	3448	Normal	4	None	0	None		16-Apr-13	256	Pending
19459	GT3026	U	112	261	Normal	4	None	0	None		17-Aug-10	<32	Pending
19495	GT3055	U	77	89	Normal	4	None	0	None				Pending
19510	GT3046	U	66	70	Normal	4	None	0	Not Examined				Pending
19511	GT3049	U	71	69	Normal	4	None	0	None	Nares occluded with dirt.			Pending
19512	GT3047	U	77	94	Normal	4	None	0	Not Examined				Pending
19514	GT3045	U	67	63	Normal	4	None	0	Not Examined	missing nails on left side (both limbs).			Pending
19516	GT3048	U	59	43	Normal	4	None	0	None				Pending
19548	GT3050	U	85	118	Normal	4	None	0	None				Pending
19549	GT3092	U	68	67	Normal	4	None	0	Not Examined	skin peeling.			Pending
19550	GT3054	U	78	86	Normal	4	None	0	None				Pending
19551	GT3051	U	77	87	Normal	4	None	0	None				Pending
19553	GT3053	U	78	107	Normal	4	None	0	None	L nare partially occluded with dirt.			Pending
19661	GT3060	U	66	57	Normal	4	None	0	Not Examined	L/R nares: occluded with dirt completely.			Pending
19679	GT3021	U	69	60	Normal	4	None	0	Not Examined	L/R nares: partially occluded.			Pending
19694	GT3159	M	312	5429	Normal	4	None	0	None	L/R nares: missing scales <25%.	21-Apr-13	<32	Pending
19706	GT3058	U	70	71	Normal	4	None	0	Not Examined				Pending
19713	GT3059	U	73	81	Normal	4	None	0	None				Pending
19726	GT3056	U	66	68	Normal	4	None	0	Not Examined				Pending
19756	GT3057	U	75	85	Normal	4	None	0	Not Examined				Pending
19804	GT3145	M	220	2098	Normal	4	None	0	None	right nare occluded with dirt.	22-Apr-13	256	Pending
19854	GT3089	U	84	121	Normal	4	None	0	None				Pending

19857	GT3088	U	78	101	Normal	4	None	0	None				Pending
19859	GT3091	U	81	108	Normal	5	None	0	None				Pending
19902	GT3204	U	160	895	Normal	4	None	0	None		13-Oct-10	<32	Pending
19904	GT3016	U	91	137	Normal	4	None	0	Not Examined		01-Jun-12	<32	Pending
19961	GT3164	M	293	4784	Normal	5	None	0	Not Examined	Could not open mouth - tucked.	15-Jun-11	<32	Pending
19980	GT3139	M	314	6003	Normal	4	None	0	None		21-Apr-13	128	Pending
19986	GT3013	U	91	160	Normal	5	None	0	Not Examined		01-Jun-12	<32	Pending
20298	GT3459	U	132	428	Normal	4	None	0	None	nares missing scales 25-50%.	04-Jul-11	<32	Pending
20308	GT3019	U	75	87	Normal	4	None	0	Not Examined				Pending
20330	GT3017	U	87	126	Normal	4	None	0	Not Examined		13-Jun-12	<32	Pending
20336	GT3226	U	164	809	Normal	4	None	0	None		04-Jul-11	<32	Pending
20337	GT3227	U	104	223	Normal	4	None	0	None		04-Jul-11	<32	Pending
20349	GT3168	M	237	2723	Normal	4	None	0	None		08-Jun-11	<32	Pending
20401	GT3093	U	79	102	Normal	4	None	0	Not Examined	L/R nares partially occluded.			Pending
20483	GT3015	U	87	139	Normal	4	None	0	Not Examined		13-Jun-12	<32	Pending
20574	GT3176	U	90	124	Normal	4	Yes	Serous 1	None	Nares occluded partially.	28-May-12	<32	Pending
20589	GT3177	U	94	150	Normal	4	Yes	Serous 1	None		28-May-12	<32	Pending
20592	GT702	F	237	2547	Normal	4	None	0	None	LM2-3 missing.	30-May-11	512	Pending
20618	GT3369	U	135	436	Normal	4	None	0	None		03-Jun-11	<32	Pending
20686	GT3469	U	153	655	Normal	4	None	0	None		10-Jun-11	<32	Pending
20687	GT3279	U	149	634	Normal	4	None	0	None		10-Jun-11	<32	Pending
20783	GT3269	U	149	632	Normal	5	None	0	None		04-Jul-11	<32	Pending
20796	GT701	F	256	2558	Normal	4	Yes	Serous 1	None	L nare: missing scales >50%. R nare: missing scales 25-50%. Anal scutes very close together may hinder egg laying.	06-Jul-11	<32	Pending
20815	GT3142	M	238	2796	Normal	5	None	0	None		07-Jul-11	128	Pending
20818	GT3135	M	217	1993	Normal	5	Yes	Serous 1	None	L/R nares: missing scales/eroded >50%.	07-Jul-11	>512	Pending
20825	GT3012	U	136	425	Normal	4	None	0	None		11-Jul-11	<32	Pending
20848	GT3133	M	303	5484	Normal	5	None	0	None		13-Jul-11	<32	Pending
20874	GT3112	U	65	58	Normal	4	None	0	Not Examined				Pending
20879	GT3005	M	271	3206	Normal	5	None	0	None		25-Jul-11	>512	Pending
20904	GT3094	U	70	63	Normal	4	None	0	Not Examined				Pending
20944	GT3137	M	268	3850	Normal	5	None	0	None		21-Apr-13	64	Pending
20964	GT3158	M	276	3499	Normal	5	None	0	None		18-Aug-11	<32	Pending

20977	GT3067	M	214	1720	Normal	4	None	0	None		23-Aug-11	>512	Pending
20984	GT3024	U	57	42	Normal	5	None	0	Not Examined				Pending
20989	GT3208	U	131	455	Normal	4	None	0	None		26-Aug-11	<32	Pending
21014	GT3025	M	259	4053	Normal	6	None	0	None	RM2 has old damage that may affect notching.	31-Aug-11	256	Pending
21015	GT3178	U	93	133	Normal	4	None	0	None	right nare completely occluded.	31-Aug-11	<32	Pending
21018	GT3000	M	210	1651	Normal	5	None	0	None		31-Aug-11	128	Pending
21023	GT3095	U	81	104	Normal	4	None	0	Not Examined				Pending
21031	GT3188	U	174	1008	Normal	4	None	0	None		01-Sep-11	<32	Pending
21053	GT3071	U	54	31	Normal	4	None	0	Not Examined				Pending
21057	GT3074	U	63	49	Normal	4	None	0	Not Examined				Pending
21058	GT3075	U	58	45	Normal	4	None	0	Not Examined	L/R nares occluded with food.			Pending
21059	GT3073	U	56	41	Normal	4	None	0	Not Examined				Pending
21060	GT3070	U	56	38	Normal	4	None	0	Not Examined				Pending
21061	GT3072	U	59	42	Normal	4	None	0	Not Examined	L/R nares occluded with food.			Pending
21161	GT3110	U	57	43	Normal	4	None	0	Not Examined				Pending
21232	GT3191	U	106	229	Normal	4	None	0	None		23-Sep-11	128	Pending
21233	GT3190	U	99	150	Normal	4	None	0	Not Examined	nares partially occluded.	23-Sep-11	32	Pending
21252	GT3064	U	132	492	Normal	4	None	0	None		26-Sep-11	64	Pending
21329	GT3042	U	162	770	Normal	5	None	0	None		03-Oct-11	128	Pending
21330	GT3043	U	150	643	Normal	5	None	0	None		03-Oct-11	32	Pending
21394	GT3170	M	270	3819	Normal	5	None	0	None		07-Oct-11	128	Pending
21396	GT3029	U	56	39	Normal	4	None	0	Not Examined				Pending
21406	GT3069	U	61	50	Normal	4	None	0	Not Examined				Pending
21525	GT3096	U	65	62	Normal	4	None	0	Not Examined				Pending
21527	GT3084	U	55	35	Normal	4	None	0	Not Examined	L/R nares partially occluded with food.			Pending
21529	GT3087	U	63	54	Normal	4	None	0	Not Examined	L/R nares occluded with dirt.			Pending

21532	GT3083	U	73	76	Normal	4	None	0	Not Examined	L/R nares partially occluded with food.			Pending
21533	GT3085	U	56	35	Normal	4	None	0	Not Examined				Pending
21539	GT3004	U	118	364	Normal	4	None	0	None		05-Jun-12	<32	Pending
21574	GT3205	U	166	959	Normal	5	None	0	None		01-Jun-12	<32	Pending
21584	GT3202	U	166	850	Normal	5	None	0	None		30-May-12	<32	Pending
21590	GT3201	U	126	399	Normal	5	None	0	None		30-May-12	<32	Pending
21612	GT3090	U	58	48	Normal	4	None	0	Not Examined				Pending
21633	GT3187	U	149	627	Normal	4	None	0	None		28-May-12	<32	Pending
21643	GT3078	U	61	50	Normal	4	None	0	Not Examined				Pending
21645	GT3077	U	63	48	Normal	4	None	0	Not Examined				Pending
21646	GT3076	U	58	46	Normal	4	None	0	Not Examined	L/R nares occluded with dirt.			Pending
21649	GT3082	U	59	42	Normal	4	None	0	Not Examined	L nare occluded completely.			Pending
21650	GT3080	U	55	34	Normal	4	None	0	Not Examined	peeling skin.			Pending
21651	GT3079	U	57	37	Normal	4	None	0	Not Examined				Pending
21652	GT3081	U	61	49	Normal	4	None	0	Not Examined	nares occluded with dirt.			Pending
21653	GT3009	M	295	4617	Normal	5	None	0	None		01-Jun-12	32	Pending
21654	GT3036	M	250	2667	Normal	5	None	0	None		01-Jun-12	32	Pending
21665	GT3040	M	252	3043	Normal	4	None	0	None		05-Jun-12	256	Pending
21667	GT3030	U	127	410	Normal	5	None	0	None		05-Jun-12	<32	Pending
21678	GT0703	U	188	1165	Normal	4	None	0	None		07-Jun-12	<32	Pending
21682	GT3111	U	56	42	Normal	4	None	0	Not Examined	L/R nares occluded with dirt.			Pending
21684	GT3183	U	129	414	Normal	4	None	0	None		01-Jun-12	<32	Pending
21701	GT3146	F	272	3517	Normal	4	None	0	None		10-Apr-13	<32	Pending
21708	GT3027	U	118	292	Normal	4	None	0	Not Examined		07-Jun-12	<32	Pending
21722	GT3034	M	235	2345	Normal	4	None	0	None		24-May-12	256	Pending
21724	GT3041	M	325	6075	Normal	4	Yes	Serous 1	None		01-Jun-12	>512	Pending
21725	GT3008	M	295	4344	Normal	5	None	0	None		01-Jun-12	128	Pending
21726	GT3035	M	279	3427	Normal	4	None	0	None		01-Jun-12	>512	Pending
21729	GT3186	F	171	1001	Normal	4	None	0	None		28-May-12	<32	Pending
21733	GT3062	U	172	1050	Normal	4	None	0	None		01-Jun-12	<32	Pending
21734	GT3063	U	181	1011	Normal	5	None	0	None		01-Jun-12	<32	Pending
21742	GT3194	F	163	757	Normal	4	None	0	None		28-May-12	<32	Pending
21758	GT3185	U	186	1280	Normal	4	None	0	None				Pending

21759	GT3173	U	194	1546	Normal	5	None	0	None		11-May-12	>512	Pending
21760	GT3220	U	186	1349	Normal	5	None	0	None		11-May-12	<32	Pending
21763	GT3225	U	156	742	Normal	4	None	0	None		11-May-12	<32	Pending
21766	GT3002	F	237	2606	Normal	5	None	0	None		17-May-12	<32	Pending
21773	GT3086	U	85	131	Normal	4	None	0	None				Pending
21779	GT3195	U	176	1005	Normal	4	None	0	None		24-May-12	<32	Pending
21780	GT3140	M	300	5320	Normal	5	None	0	None		24-May-12	>512	Pending
21782	GT3219	U	189	1240	Normal	5	None	0	None		24-May-12	<32	Pending
21791	GT3199	U	144	585	Normal	4	None	0	None		01-Jun-12	<32	Pending
21855	GT3192	U	106	226	Normal	5	None	0	None	Left nare occluded partially	06-Jul-12	<32	Pending
21888	GT3189	U	102	197	Normal	4	None	0	None		13-Jul-12	<32	Pending
21891	GT3138	F	248	2672	Normal	4	None	0	None		13-Jul-12	>512	Pending
21895	GT3162	M	274	3017	Normal	4	None	0	None		13-Jul-12	>512	Pending
21901	GT3065	U	95	197	Normal	4	None	0	None		28-Aug-12	256	Pending
21952	GT3007	U	170	889	Normal	5	None	0	None		07-Aug-12	128	Pending
21953	GT3006	U	131	469	Normal	4	None	0	None		16-Apr-13	64	Pending
22024	GT3011	F	242	2345	Normal	4	None	0	None		28-Aug-12	256	Pending
22061	GT3141	F	284	4583	Normal	6	None	0	None	Tissue eroded between nares.	16-Apr-13	<32	Pending
22082	GT3068	M	275	3503	Normal	5	None	0	None		14-Sep-12	32	Pending
22134	GT3001	F	203	1340	Normal	5	None	0	None		28-Sep-12	<32	Pending
22177	GT3020	U	160	840	Normal	4	None	0	None	RM 8-10 damaged, exposed bone on gular, missing scales on head.	11-Oct-12	<32	Pending
22178	GT3153	F	291	4662	Normal	4	None	0	None		10-Apr-13	32	Pending
22179	GT3134	M	285	3303	Normal	4	None	0	None		21-Apr-13	128	Pending
22222	GT3003	F	282	3253	Normal	4	None	0	None		16-Apr-13	<32	Pending
22241	GT3038	U	78	96	Normal	4	None	0	None	Generalized skin peeling.	01-Apr-13	<32	Pending
22255	GT3039	U	77	93	Normal	5	None	0	None		01-Apr-13	<32	Pending
22257	GT3037	U	98	187	Normal	4	None	0	None	Shell is very dark.	01-Apr-13	<32	Pending

Attachment 1

Health Eligibility Criteria

2013 Translocation from DTCC to Greater Trout Canyon 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 ≤ 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 ≤ 330 mm

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