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Appendix C

Desert Tortoise Clearance Survey Protocol

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1.0 Qualified Biologist Definition

As described in Section 6.3.3.2 of the MSHCP Amendment, the following terms and definitions will be used to determine qualified biologists to conduct desert tortoise clearance surveys and handling. Survey and clearance guidance is based on the US Fish and Wildlife Service (USFWS) Field Manual,¹ Clearance Survey Protocol for the Mojave Desert Tortoise,² and the guidance “Preparing for Any Action that may Occur within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*).”³ Guidance and protocols as described in this document may be updated to be consistent with current guidelines.

1.1 MSHCP Desert Tortoise Biologist

A person with demonstrated experience working with desert tortoises and their habitat including conducting protocol surveys, locating tortoise sign, burrow excavation, and oversight of tortoise fence installation. Resumes will be submitted to the DCP for approval prior to implementing the desert tortoise measures. Qualifications must meet the current U.S. Fish and Wildlife Service (USFWS) standards for a desert tortoise authorized biologist. The DCP will also develop a Species Clearance class approved by the USFWS for biologists on desert tortoise biology, clearance protocols. All MSHCP Desert Tortoise Biologists must attend this class prior to conducting activities that may result in take covered under the MSHCP Amendment.

1.2 MSHCP Assistant Desert Tortoise Biologist

A person with demonstrated experience working with desert tortoises and their habitat including conducting protocol surveys, locating tortoise sign, burrow excavation, and oversight of tortoise fence installation. MSHCP Assistant Desert Tortoise Biologists are generally less experienced than MSHCP Desert Tortoise Biologists and must be overseen by a MSHCP Desert Tortoise Biologist when conducting clearance surveys or other activities approved under the MSHCP Amendment. Resumes will be submitted to the DCP for approval prior to implementing the desert tortoise measures. Attendance at the Species Clearance class is also required prior to conducting activities that may result in take covered under the MSHCP Amendment.

2.0 Desert Tortoise Survey

2.1 General Survey Guidance

1. Surveys shall occur up to 1 month prior to construction.
2. One MSHCP Desert Tortoise Biologist per clearance survey site shall be present to supervise MSHCP Assistant Desert Tortoise Biologists and oversee clearances.
3. Clearance surveys require a single pass with 100 percent coverage of the project area.

¹ [USFWS] U.S. Fish and Wildlife Service. 2009. *Desert Tortoise (Mojave Population) Field Manual: (Gopherus agassizii). Region 8, Sacramento, California.*

² [USFWS] U.S. Fish and Wildlife Service. 2019. *Clearance Survey Protocol for the Mojave Desert Tortoise. In: USFWS. 2020. Translocation of Mojave Desert Tortoises from Project Sites: Plan Development Guidance. USFWS, Las Vegas, Nevada.*

³ [USFWS] U.S. Fish and Wildlife Service. 2019. *Preparing for Any Action that may Occur within the Range of the Mojave Desert Tortoise (Gopherus agassizii). October 8.*

- a) Focus on locating all desert tortoises above and below ground
 - b) Surveys must consist of at least two consecutive surveys of the site
 - c) Surveys shall involve walking transects less than or equal to 10 feet (3 meters) wide under typical conditions.
 - d) Surveys should be conducted when desert tortoises are most active (see i and ii, below); however, clearance surveys may be conducted at any time of year (see 2.2)
 - i) April and May, or September and October, and
 - ii) Air temperatures are below 95 degrees F (35 degrees C) with air temperature measured approximately 5 centimeters from the soil in an areas of full sun but in the shade of the observer.
4. Any time a vehicle is parked, whether the engine is engaged or not, the ground around and under the vehicle shall be inspected for desert tortoise immediately prior to moving the vehicle.
 5. Desert tortoises shall be collected and transported to the location of the former Desert Tortoise Conservation Center (DTCC)⁴. This location may be changed at the direction of the USFWS.
 6. Global Positioning system (GPS) data points of burrows and location of tortoises shall be collected in Universal Transverse Mercator (UTM) Zone 11 North American Datum 1983 (NAD83) and all data shall be entered on the USFWS data sheet (Attachment 1) and reported back to the DCP.

2.2 Desert Tortoise Clearance

1. Desert tortoise clearances may occur year-round, although preferred to be conducted when desert tortoises are most active (as described in Section 2.1). All clearance activities (capture, transport, release, etc.) shall occur when ambient temperatures are below 95 degrees F (35 degrees C) and not anticipated to rise above 95 degrees F (35 degrees C) before handling and processing desert tortoises are completed.
2. All potential burrows with non-visible ends shall be scoped or hand excavated to determine presence/absence of any protected species including eggs. Excavation will be conducted using hand tools as described in Section 3 below.
 - a) Any burrow occupied by burrowing owl or other animals shall be left intact, unless burrowing owl procedures allow for excavation to be conducted (see **Appendix X**).
3. Should Gila monster be encountered GPS data points of burrows, photos, and location of Gila monster shall be collected in UTM Zone 11 NAD83 and all data shall be reported to the Nevada Department of Wildlife (NDOW) at (702) 486-5127.
 - a) If the Gila monster is exposed and there is potential for harm or injury, alert NDOW immediately. Should NDOW's assistance be delayed, MSHCP Desert Tortoise Biologists or Assistant Desert Tortoise Biologists should detain the Gila monster out of harms way until NDOW personnel can respond. The Gila monster should be detained until NDOW biologists have responded.
 - i) Should NDOW not be immediately available to respond for photo-documentation, a digital (5 megapixel or higher) or 35mm camera will be used to take good quality images of the Gila

⁴ The DTCC is no longer operational, but the facility is maintained by Clark County and serves the same purpose. The USFWS may provide updated guidance for transport location if new facilities are created or more appropriate facilities determined.

- monster in situ at the location of live encounter or dead salvage. The pictures will be provided to NDOW at reptiles@ndow.org along with specific location information including GPS coordinates (as described above), date, time, and habitat description. Pictures will show the following information: (1) Encounter location (landscape with Gila monster in clear view); and if Gila monster is dead/salvage, (2) a clear overhead shot of the entire body with a ruler next to it for scale (Gila monster should fill camera's field of view and be in sharp focus); (3) a clear, overhead close-up of the head (head should fill camera's field of view and be in sharp focus).⁵
4. Desert tortoises in burrows shall be removed through grasping and removing, tapping, or careful excavation of the burrow.
 - a) If the tortoise is within arm's reach, firmly grasp the gular, plastron, or posterior edge of the carapace and gently pull the tortoise towards the burrow entrance.
 - i) If the tortoise resists to the point where moderate pulling effort is unsuccessful, stop pulling while maintaining a grip on the tortoise. Resume pulling when the tortoise relaxes.
 - ii) Never use a hook or other instrument to remove a tortoise from a burrow.
 - b) If the tortoise is visible but deep in its burrow, the observer shall remove the tortoise through careful excavation of the burrow following protocols described in Section 3 of this document.
 5. Desert tortoises shall be collected and placed in a disinfected/clean container for transport following the protocols listed in this document.
 - a) If tortoises are found together or occupying the same burrow they can be placed in the same container if there is room, otherwise tortoises shall be placed one to a container.

3.0 Desert Tortoise Burrow Excavation

1. Excavators should wear leather or cloth gloves during burrow excavation to avoid being bitten or stung by venomous animals.
2. All potential burrows within the project site shall be excavated, except those occupied by other animals. Burrows occupied by burrowing owl may be excavated if procedures as described in Appendix X allow for excavation.
 - a) Spider-webs, litter, and other debris may accumulate in burrow openings overnight, and openings may collapse during winter rains.
 - b) Do not assume that a burrow is inactive if it looks unused or collapsed.
 - c) If excavation is not possible with hand tools because of rock or sediment type, the burrow will be scoped to the extent feasible to determine occupancy. If confirmed unoccupied, the entrance will be closed to block reentry by desert tortoise and other wildlife. If the burrow cannot be confirmed unoccupied by desert tortoise, a motion sensor camera or other camera trap device suitable for detection of desert tortoise will be installed to monitor the entrance for a minimum of 3 days. If no desert tortoise activity is detected at the burrow, the entrance will be closed. If desert tortoise

⁵ [NDOW] Nevada Department of Wildlife. 2012. Gila Monster Status, Identification, and Reporting Protocol for Observations. Southern Region. September 7.

is observed to use and occupy the burrow, the Service will be consulted for next steps such as use of mechanized equipment to excavate the burrow.

3. Feel for desert tortoise eggs by gently probing the soil in front of the burrow opening with a blunt instrument and along the floor of the burrow as it is excavated.
 - a) Areas of less compacted soil may indicate a nest.
 - b) Eggs have been found up to 6 feet (1.9 meters) in front of (outside of) the burrow opening and up to 6 feet (1.9 meters) within the burrow.
 - c) Removal of the top 10 inches (25 centimeters) of soil (or until a hard layer of soil is encountered) will typically ensure that all desert tortoise eggs, if present, will be detected.
 - d) If eggs are detected, see methods in Section 5.
4. Blunt-nosed shovels or garden trowels shall be used for excavation.
 - a) Place a shovel in the burrow entrance, or garden trowel for small burrows, and slice away the ceiling with the second shovel or trowel.
 - b) Remove the soil with the first shovel or trowel as excavation proceeds and repeat.
5. The burrow shall be excavated slowly and carefully.
 - a) Stop often to see if a tortoise or eggs are within reach.
 - b) Do not collapse inside the burrow ahead of the shovel or trowel.
6. Burrows shall be excavated an additional foot-or-so (0.3 meter) beyond the suspected end to ensure that a desert tortoise is not behind a dirt plug or mound.
 - a) All side tunnels within the burrow shall be searched for tortoises.
 - b) If a tortoise is found, do not assume that it is alone.
 - c) After removing the first tortoise encountered, return to the burrow and continue to excavate it looking for additional tortoises or eggs.

4.0 Desert Tortoise Handling

4.1 General Handling

1. Desert tortoises shall be treated in a manner to ensure that they do not overheat or exhibit signs of overheating, which include aggressive struggling by the tortoise, hot to the touch, frothing at the mouth, excessive salivation, or voiding its bladder.
2. When handling desert tortoises, staff shall wear a new pair of disposable latex or rubber gloves. One pair of gloves, per tortoise, per encounter.
 - a) If a glove is torn while handling a tortoise, which is likely if its toenail scrapes the glove, put on a new glove over the old one.
 - b) Used gloves and disposable supplies (e.g., surveyors tape or flagging, etc.) must be placed in a plastic trash bag and disposed of offsite.
3. All tools that contact tortoises shall be disinfected after each use.

4.2 Hot Temperatures

1. Desert tortoises shall be treated in a manner to ensure that they do not overheat or exhibit signs of overheating, which include aggressive struggling by the tortoise, hot to the touch, frothing at the mouth, excessive salivation, or voiding its bladder.
2. Desert tortoises shall not be placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being.
3. Desert tortoises shall be kept shaded at all times until they are transported to the location of the former DTCC facility⁴ (If necessary, remove the upper layer of hot substrate to expose a cooler layer below). The transport location may be updated by the USFWS.
 - a) When possible, desert tortoise should not be captured if ground temperature is anticipated to exceed 95 degrees F (35 degrees C) before handling and transport can be completed.
 - b) If the ground temperature exceeds 95 degrees F (35 degrees C) during handling, desert tortoises shall be kept shaded in an environment where the ambient air temperatures do not exceed 91 degrees F (32.7 degrees C) and ground temperature does not exceed 95 degrees F (35 degrees C).
 - c) Desert tortoises that begin frothing at the mouth are probably nearing an upper lethal body temperature and shall immediately be moved to a climate-controlled environment, or if a nearby climate-controlled environment is unavailable, the tortoise shall immediately be placed in an open, disinfected plastic container in the shade and shall have cool water poured over the shell to a depth that ensures the nares remain above the water level.

4.3 Desert Tortoise Urination and Hydration

1. Desert tortoises may void their bladder when first encountered, picked up, or carried. Since desert tortoises store water in their bladders, any loss of this fluid may result in death.⁶
 - a) Discourage bladder voiding by gently and slowly moving the tortoise. Avoid all unnecessary actions that may result in stress to the animal.
 - b) Bladder voiding may also be discouraged by pressing the tortoise's tail against its vent while you are carrying it. Also, press the tail against its vent if it starts to urinate.
2. When weather records indicate that desert tortoises likely have not had a chance to drink within the previous or current active season, or clinical signs indicate that a tortoise may be dehydrated, tortoises shall be soaked to be rehydrated prior to transport to a temporary facility or if to be directly translocated, prior to transport to release location.
 - a) Place tortoise in an uncovered container or other suitable tub-like receptacle with water level just below the tortoise's chin. Water temperature should be tepid to cool in warm months or tepid to slightly warm in cool months. Soak tortoise for 15-30 minutes.
 - b) Container with the tortoise should be placed in the shade or in summer months in an air-conditioned vehicle and in winter months in a vehicle at approximately 55 degrees F. Tortoises shall never be left unattended in a vehicle.

⁶ Averill-Murray, Roy C. 2002. *Reproduction of Gopherus agassizii in the Sonoran Desert, Arizona. Chelonian Conservation and Biology*. 4(2): 295-301.

- c) If containers are re-used, containers shall be sterilized using 10% bleach solution, or other approved disinfectants such as 1% Trifectant solution, before being used for a different tortoise.

5.0 Nest and Egg Handling Protocol

1. Any nest found will be carefully excavated by hand at a time of day when the air temperature 6 inches (15 centimeters) above the ground is approximately equal to the soil temperature at egg level.
2. Excavate suspected nests by hand.
 - a) Disposable rubber or latex gloves must be work when marking and handling eggs.
3. Before disturbance of nest contents, each egg will be marked with a small dot on the top with a felt-tipped pen to establish and maintain the egg's orientation.
 - a) Eggs must be maintained in this orientation at all times.
4. Extra care must be taken August – October as eggs shells become extremely fragile.
 - a) Any broken eggs will be buried nearby and left in the field, or if approved, contents preserved for research projects.
 - b) All broken eggs shall be reported on the data sheet (Attachment 1), and the DCP will report to the USFWS.
5. Measure and record the depth of the nest below the soil surface and the position of the nest relative to the burrow entrance (or other shelter).
6. Place approximately 1 inches (2.5 centimeters) of soil from the nest area in a bucket and carefully transfer the eggs to the bucket, keeping the eggs in correct orientation.
 - a) Gently cover the eggs with the soil that is free of cobbles and pebbles, to a depth that is equivalent to the original nest.
7. Transport the eggs to the former DTCC facility, and the DCP will coordinate for transfer to the Service-approved relocation site.

6.0 Desert Tortoise Transport

1. During transport each tortoise shall remain in a clean, unused container that is covered or closed.
 - a) Newspaper or hay shall be placed in the bottom to absorb any urine that is voided.
 - b) The container shall be ventilated in such a way that a tortoise's leg or head will not get stuck.
 - c) Desert tortoises shall not be allowed to roam freely in the vehicle.
2. If re-used, containers shall be sterilized using 10% bleach solution, or other approved disinfectants such as 1% Trifectant solution, before being used to transport other tortoises.
3. Tortoises shall not be placed over the catalytic converter or other area that becomes hot with vehicle operation.
4. Tortoises shall never be left unattended in a vehicle.
5. During summer months, tortoises shall be transported in an air conditioned vehicle.

6. During winter inactivity period, tortoises shall be transported in a vehicle maintained at approximately 55 degrees F, which may allow it to remain in a physiological state of hibernation.
7. Tortoises shall never be transported in the bed of a truck.

7.0 Desert Tortoise Disposition

1. Desert tortoises found during clearance surveys will be transported to the location of the former DTCC facility⁴ or directly to a Service-approved translocation site.
 - a) Tortoises shall be transported to the former DTCC facility or Service-approved translocation site the same day of the survey and clearance.
 - i) No tortoises shall be held by a surveyor overnight.
 - b) Access will be granted to the former DTCC but surveyor must contact the DCP 24 hours prior to the clearances to allow for intake preparation.
 - c) Tortoises shall be dropped off at the former DTCC facility and meet DCP staff at the facility for transfer/collection of tortoises.
 - i) Surveyors using personal reusable containers shall collect used tortoise transport containers after 48 hours, but within 120 hours. Containers must be clearly marked by the owner to be eligible for collection. DCP may also provide surveyors with cardboard boxes upon request.
 - ii) Upon picking up personal containers for re-use, the surveyor is responsible for cleaning and disinfecting containers. Surveyor will have access to water at the former DTCC to rinse them. Access is only allowed for containers used to drop off desert tortoises at the former DTCC facility at the time of container pick-up.
 - iii) Following drop-off, the DCP will coordinate desert tortoise health assessments and translocation to Service-approved relocation sites.
 - d) If a new facility is approved for desert tortoise temporary holding, these protocols will be updated with current location information and the DCP will send notice to tortoise surveyors.

Date of survey: _____ Survey biologist(s): _____
(day, month, year) (name, email, and phone number)

Site description: _____
(project name and size; general location)

County: _____ Quad: _____ Location: _____
(UTM coordinates, lat-long, and/or TRS; map datum)

Circle one: 100% coverage or Sampling Area size to be surveyed: _____ Transect #: _____ Transect length: _____

GPS Start-point: _____ Start time: _____ am/pm
(easting, northing, elevation in meters)

GPS End-point: _____ End time: _____ am/pm
(easting, northing, elevation in meters)

Start Temp: _____ °C End Temp: _____ °C

Live Tortoises

Detection number	GPS location Easting Northing		Time	Tortoise location <i>(in burrow: all of tortoise beneath plane of burrow opening, or not in burrow)</i>	Approx MCL ≥180 mm? <i>(Yes, No or Unknown)</i>	Existing tag # and color, if present
1						
2						
3						
4						
5						
6						
7						
8						

Tortoise Sign (burrows, scats, carcasses, etc)

Detection number	GPS location Easting Northing		Type of sign <i>(burrows, scats, carcass, etc)</i>	Description and comments
1				
2				
3				
4				
5				
6				
7				
8				

Tortoise Nests/Eggs

Detection number	GPS location		Distance of Nest from Burrow/Cover Entrance	Depth of nest	Description and comments
	Easting	Northing			
1					
2					
3					
4					
5					
6					
7					
8					

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