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# **Fort Irwin Annual Report**

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### Appendices

- A – Berry et al Health and Disease Annual Report 2008**
- B – Jacobsen and Berry Desert Tortoise Annual Report 2008**
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- D – Esque et al Fort Irwin Desert Tortoise Translocation Project Annual  
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- E – Boarman et al Desert Tortoise Research and Surveys in the Southern and  
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## B.O. # 1-8-95-F-16R

As per the Biological Opinion for the Army’s Current Mission at the National Training Center, Fort Irwin, California, we are providing a table of all desert tortoise encounters by Fort Irwin personnel during calendar year 2008 (Table 1) including the number and types of tortoise takes. For calendar year 2008, there were 13 desert tortoise encounters, including carcass sightings, within the original boundary of Fort Irwin (Table 1). This figure includes six (6) sightings where the animal was not in harm’s way and no actions were taken to relocate the animal, five (5) carcasses incidentally observed during various survey efforts and two (2) relocations by authorized biologists where the tortoise was moved greater than 100 meters from its original location. All tortoises listed as “relocated” were in good general health and none voided as a result of handling or relocation.

**Table 1. Desert tortoise encounters by DPW staff on the NTC & Fort Irwin in 2008.**

*UTM coordinates reported in Zone 11, NAD 83*

<b>Date</b>	<b>Easting</b>	<b>Northing</b>	<b>Type</b>	<b>Relocated to</b>
4/6/2008	532589	3906008	Relocated	532547 3906128
4/26/2008	553104	3908358	Sighting	
4/28/2008	523036	3901102	Carcass	
4/28/2008	527034	3895764	Carcass	
6/12/2008	504163	3895462	Sighting	
“summer” 2008	Not recorded		Carcass	
9/30/2008	523525	3889950	Relocated	523560 3889861
9/30/2008	90 gridline		Sighting	
9/30/2008	90 gridline		Sighting	
10/9/2008	522015	3890198	Carcass	
10/15/2008	Not recorded		Sighting	
11/17/2008	Not recorded		Sighting	
11/26/2008	Not recorded		Carcass	

### Summary of 2008 Survey and Monitoring Efforts

- On March 3, 2008 the Sitting Bull Restoration Area was surveyed for desert tortoise and other sensitive species. The entire Sitting Bull Restoration Area polygon was surveyed by walking north-south transects in 30 meter intervals. There were no desert tortoise burrows or sign throughout the Sitting Bull Area. The Restoration Area was mostly devoid of vegetation, and consequently there was a lack of wildlife activity. There was no sign of desert tortoise or of sensitive species (Mojave fringe toed lizard, burrowing owl). Therefore, the Sitting Bull Restoration Area was deemed clear for ground disturbing activity.
- On March 9<sup>th</sup>, 2008 Fort Irwin biologists performed a survey for desert tortoises (*Gopherus agassizii*) at ITAM’s proposed road improvement site, Yermo. The survey was conducted according to United States Fish and Wildlife Service (USFWS) protocols for the desert tortoise. There was no desert tortoise sign observed during the survey. The areas surveyed varied from slightly impacted to highly impacted. There is a small

potential that tortoises may wander into the areas during the project. No other sensitive plant or animal species were observed.

- On June 20<sup>th</sup> 2008 three Fort Irwin biologists surveyed a section of land adjacent to Fort Irwin Road prior to the construction of a truck bypass route. The proposed road was 14 feet wide and approximately 2.5 miles long. The survey followed United States Fish and Wildlife Service protocol. No tortoises were seen. Multiple burrows were noted but none housed tortoises. Monitoring has continued on this project since June and no tortoises have been sighted.
- On October 15<sup>th</sup> through the 17<sup>th</sup> 2008, Fort Irwin biologists surveyed the proposed site for installation of three wind energy turbines. Surveys were conducted to analyze all plant and animal species on the site. Surveys were particularly focused on desert tortoise (*Gopherus agassizii*) and Lane Mountain milkvetch (*Astragalus jaegerianus*) that could potentially be found at the site. The survey followed United States Fish and Wildlife Service protocols. The survey area was approximately 20 hectares, covering the project location and a buffer zone around the proposed area of activity. After careful evaluation it was determined the area did not contain any sensitive species and that no biological constraints would prevent the addition of wind turbines and access roads at this site.
- On November 3<sup>rd</sup> and 4<sup>th</sup> 2008 Fort Irwin biologists conducted a preliminary survey at the intersection of Live Fire Ranges 16 and 19 where a new Military Operations in Urban Terrain (MOUT) site has been proposed. The estimated area of impact covers almost 1900 acres. Since the area was previously highly disturbed the survey focused on the undisturbed areas most likely to contain desert tortoises. Five areas of 100x100 meters were surveyed. No desert tortoises were seen however some possible burrows were sighted. A more intensive survey will occur prior to construction when more information about the project becomes available.
- On December 4<sup>th</sup> and 5<sup>th</sup> 2008 three Fort Irwin biologists surveyed the proposed Route B, a one mile long road connecting the main Fort Irwin reservation with the western expansion area. United States Fish and Wildlife Service survey protocols were used and no desert tortoise burrows or sign were sited. As part of the Route B project, an adjacent existing road will be widened. A three mile stretch of land associated with this aspect of the project was surveyed. Three possible desert tortoise burrows (unoccupied) were identified. Fort Irwin biologists will continue to monitor this project through completion of construction activities.
- On 16 December 2008 two Fort Irwin biologists accompanied Operations Group personnel through the western expansion area to determine a biologically feasible route for a Stryker unit road march from Fort Irwin to Southern California Logistics Airport (SCLA). This activity will occur on February 18 and 19, 2009 during Rotation 09-04. No desert tortoises were encountered or are expected to be affected by this activity. All participating personnel will be briefed regarding the desert tortoise and Fort Irwin biologists will precede the road march to insure no desert tortoises are harmed.

This biological opinion requires any disturbance to desert tortoise critical habitat south of the 90 Grid Line be reported. In association with the ongoing desert tortoise translocation project being executed in lands south of the 90 Grid Line (the southern expansion area or SEA), a number of activities occurred during 2008. Desert tortoises south of the 90 Grid Line, previously translocated, were translocated to one of 11 translocation plots south of Fort Irwin. Prior to being translocated, all tortoises were subjected to a health assessment including drawing blood to test for exposure to disease. All tortoises exhibiting severe clinical signs of disease or testing ELISA suspect or positive were left in the SEA. Additionally, disease pens were constructed on suitable desert tortoise habitat south of the 90 Grid Line. The intent of these pens is to house those tortoises exhibiting severe clinical signs of disease or testing ELISA positive or suspect. Subject to completion of translocating all tortoises from the SEA (lands south of the 90 Grid Line) it is Fort Irwin's plan to begin training activities on these lands.

Recommendations – This biological opinion covers lands encompassed by the original Fort Irwin boundary. A separate biological opinion covers lands acquired through the Fort Irwin land expansion project. Following completion of the Fort Irwin translocation project recommend this biological opinion be revised to incorporate all Fort Irwin lands under one biological opinion.

**B.O. # 1-8-03-F-48**  
**Desert Tortoise Permit TE-102235-3**

The Fort Irwin Biological Opinion for the Proposed Addition to Maneuver Training Lands at Fort Irwin, California requires the Army to report the details on each desert tortoise that is found dead or injured within the new training areas at Fort Irwin or at translocation sites and report any conservation actions taken for the desert tortoise and the Lane Mountain milkvetch. The expansion areas are not currently available for military training (pending completion of all environmental documentation) and are being managed in a manner consistent with Bureau of Land Management desert wildlife management area protocols. The following desert tortoise translocation project activities took place this year:

- Total injuries and mortalities of all uniquely-identified tortoises involved in the Fort Irwin Translocation Project are presented in Table 2. Two hundred (200) mortalities and six (6) injured tortoises were recorded during 2008.

**Table 2. Mortalities and injuries of uniquely-identified desert tortoises at Fort Irwin in 2008.**

<b>Tortoise ID #</b>	<b>Date of Observation</b>	<b>Easting</b>	<b>Northing</b>	<b>Status</b>	<b>Cause of Death or Injury</b>
37	9/21/2008	527378	3887993	dead	other
40	9/11/2008	527412	3887947	dead	unknown
46	5/4/2008	529588	3889880	dead	unknown
55	3/5/2008	537922	3880072	dead	canid
890	8/11/2008	526203	3888812	dead	necropsy
2005	10/2/2008	521937	3871953	dead	unknown
2009	3/28/2008			dead	canid
2037	1/13/2008	533496	3887222	dead	unknown
2047	5/16/2008			dead	canid
2524	5/6/2008	528176	3887615	dead	canid
2528	5/8/2008	518269	3880163	dead	canid
2549	7/8/2008	521700	3871001	dead	unknown
2562	3/25/2008			dead	canid
2574	7/14/2008			dead	canid
3001	4/8/2008	522181	3866117	dead	unknown
3002	1/14/2008	522419	3865647	dead	canid
3004	1/14/2008	519596	3866959	dead	natural
3006	5/5/2008	508690	3886521	dead	canid
3009	6/3/2008	518512	3881296	dead	canid
3011	4/3/2008	518451	3882108	dead	natural
3018	10/2/2008	554219	3884078	dead	canid
3024	7/15/2008	519451	3870144	dead	canid
3028	6/30/2008	523288	3864844	dead	canid
3029	1/14/2008	522785	3866440	dead	canid
3032	9/3/2008	512048	3882102	dead	canid

3036	4/3/2008	509792	3880830	dead	canid
3038	3/26/2008	513428	3877544	dead	unknown
3047	1/15/2008	513414	3879184	dead	unknown
3063	1/16/2008	532746	3886473	dead	unknown
3067	1/15/2008	512938	3877984	dead	unknown
3068	2/13/2008	512542	3877760	dead	canid
3070	6/30/2008	537416	3879271	dead	canid
3077	7/27/2008	520594	3873389	dead	canid
3082	5/23/2008	509624	3880096	dead	canid
3094	2/12/2008	512270	3883139	dead	unknown
3095	4/3/2008	509509	3880646	dead	canid
3098	5/5/2008	508533	3879771	dead	canid
3101	3/28/2008	509009	3881081	dead	unknown
3102	7/23/2008	518762	3871794	dead	canid
3103	4/2/2008	511522	3883201	dead	canid
3104	8/14/2008	510650	3883779	dead	canid
3107	2/12/2008	513352	3877027	dead	unknown
3110	1/15/2008	512696	3877290	dead	canid
3113	1/14/2008	528851	3881464	dead	unknown
3126	8/5/2008	512844	3880166	dead	canid
3128	4/3/2008	508112	3880193	dead	canid
3129	4/29/2008	512955	3878094	dead	canid
3134	2/13/2008	513449	3877348	dead	canid
3142	7/16/2008	520550	3871179	dead	canid
3146	9/3/2008	520013	3877302	dead	canid
3159	3/26/2008	513232	3876995	dead	unknown
3161	5/25/2008	513301	3877180	dead	canid
3168	9/3/2008	518907	3876668	dead	other
3170	11/5/2008	546007	3879590	dead	canid
3175	7/2/2008	517889	3876737	dead	canid
3201	4/2/2008	510789	3883895	dead	canid
3217	9/3/2008	514242	3885157	dead	canid
3222	9/2/2008	518513	3882047	dead	unknown
3225	3/3/2008	509919	3878181	dead	canid
3229	2/11/2008	543895	3882361	dead	canid
3242	4/1/2008	511142	3881352	dead	unknown
3282	9/18/2008	549587	3885382	dead	unknown
3286	9/17/2008	548111	3886568	dead	canid
3298	9/22/2008	536001	3879972	dead	canid
3302	7/26/2008	520119	3872105	dead	canid
3307	2/13/2008	520010	3871304	dead	unknown

3313	1/19/2008	548329	3885664	dead	canid
3366	10/14/2008	518105	3881186	dead	canid
3381	7/14/2008	525589	3886599	dead	necropsy
3408	7/28/2008	525173	3886747	dead	necropsy
3413	4/10/2008	548906	3885306	dead	unknown
3442	10/13/2008	521637	3869424	dead	unknown
3453	10/20/2008	521741	3888349	dead	other
3454	5/5/2008	522932	3887941	dead	necropsy
3460	9/19/2008	521003	3871293	dead	canid
3468	5/12/2008	524237	3889048	dead	necropsy
3469	8/20/2008	524469	3887921	dead	necropsy
3470	10/8/2008	554595	3889216	dead	unknown
3475	8/27/2008	520277	3868485	dead	unknown
3477	6/17/2008	524500	3888696	dead	necropsy
3478	4/23/2008	526805	3887876	dead	unknown
3479	6/30/2008	524266	3889131	dead	necropsy
3481	7/5/2008			dead	unknown
3507	7/26/2008	521119	3871988	dead	canid
3528	10/23/2008	526404	3887357	dead	canid
3581	3/31/2008	549449	3882881	dead	canid
3582	3/31/2008	549962	3883161	dead	canid
3595	1/19/2008			dead	canid
3604	9/8/2008	522921	3888389	dead	necropsy
3605	5/2/2008	522278	3887950	dead	canid
3606	11/2/2008	519329	3869363	dead	unknown
3607	10/19/2008	520467	3869155	dead	canid
3618	7/15/2008	520226	3868981	dead	canid
3628	8/29/2008	522880	3871947	dead	unknown
3700	11/2/2008	520448	3870996	dead	canid
3703	8/9/2008	519850	3870898	dead	canid
3706	3/19/2008	519969	3871651	dead	canid
3708	10/19/2008	523921	3872366	dead	unknown
3709	6/24/2008	521397	3868690	dead	unknown
3711	10/8/2008	521668	3868849	dead	canid
3712	8/20/2008	521804	3868987	dead	unknown
3720	10/15/2008	550214	3885886	dead	canid
4007	7/23/2008	519797	3873062	dead	canid
4011	12/10/2008	518266	3877929	dead	canid
4014	5/25/2008	541130	3889822	dead	canid
4018	5/12/2008	537152	3880227	dead	canid
4025	4/9/2008	528688	3889774	dead	canid



4029	7/2/2008	521239	3871592	dead	canid
4031	10/10/2008	520427	3873600	dead	canid
4032	6/5/2008	531597	3887466	dead	canid
4037	7/16/2008	528706	3888799	dead	canid
4040	6/19/2008	537017	3881004	dead	canid
4043	3/28/2008	533664	3889734	dead	canid
4058	4/15/2008	515016	3875970	dead	canid
4059	6/5/2008	519746	3876746	dead	canid
4093	6/13/2008	508136	3879034	dead	canid
4097	5/27/2008	510621	3880906	dead	canid
4130	5/28/2008	530677	3889921	dead	canid
4137	3/31/2008	509234	3880096	dead	canid
4142	9/27/2008	506923	3882259	dead	canid
4159	7/14/2008	550362	3892571	dead	canid
4161	7/15/2008	530203	3888082	dead	canid
4165	6/3/2008	518676	3876143	dead	canid
4180	4/15/2008	510494	3880734	dead	canid
4182	12/10/2008	519583	3875618	dead	canid
4186	5/20/2008	535934	3879411	dead	natural
4209	5/20/2008	509190	3880315	dead	unknown
4212	10/30/2008	536267	3880303	dead	unknown
4215	4/7/2008	508975	3880147	dead	canid
4218	4/12/2008	547939	3890801	dead	vehicle impact
4226	9/20/2008	520888	3871956	dead	canid
4230	8/16/2008	528465	3890205	dead	canid
4233	5/22/2008	518533	3874750	dead	canid
4237	7/17/2008	508840	3879840	dead	other
4248	11/13/2008	518396	3876448	dead	canid
4250	8/1/2008	548550	3891375	dead	canid
4254	6/23/2008	519995	3876007	dead	canid
4262	5/21/2008	537099	3878074	dead	unknown
4263	8/6/2008	548637	3890703	dead	canid
4266	4/9/2008	548801	3890613	dead	canid
4267	3/29/2008	508339	3879945	dead	unknown
4270	4/11/2008	548787	3890498	dead	canid
4272	5/24/2008	517634	3883004	dead	natural
4274	10/14/2008	509396	3880330	dead	canid
4280	4/1/2008	513404	3885642	dead	canid
4282	7/26/2008	519973	3872084	dead	canid
4283	5/10/2008	535828	3880366	dead	canid
4292	3/27/2008	549014	3890852	dead	unknown

4295	9/19/2008	509619	3879934	dead	canid
4296	4/8/2008	548495	3892319	dead	canid
4304	9/17/2008	519889	3872567	dead	canid
4320	9/11/2008	519391	3877070	dead	canid
4343	11/2/2008	527279	3887605	dead	unknown
4359	6/23/2008	517982	3874434	dead	canid
4360	3/28/2008	528514	3888549	dead	unknown
4388	3/26/2008			dead	canid
4390	2/14/2008			dead	canid
4391	9/21/2008	525104	3889606	dead	canid
4393	2/14/2008	524584	3889905	dead	canid
4399	9/11/2008	517983	3875444	dead	canid
4408	9/27/2008	528120	3888000	dead	canid
4409	9/20/2008	520736	3872096	dead	canid
4413	7/14/2008	520104	3892095	dead	canid
4417	4/28/2008	530673	3889522	dead	necropsy
4443	8/6/2008	509244	3881143	dead	canid
4448	7/5/2008	518481	3876590	dead	canid
4451	4/9/2008	520789	3890523	dead	canid
4458	8/24/2008	520412	3873272	dead	canid
4469	6/6/2008			dead	unknown
4481	5/20/2008	529410	3886487	dead	canid
4484	5/28/2008	548299	3887637	dead	canid
4487	6/2/2008	520306	3873020	dead	canid
4488	11/8/2008	548577	3885422	dead	canid
4489	5/2/2008	508611	3887827	dead	canid
4490	7/20/2008	542422	3889318	dead	raven
4491	5/15/2008	548399	3891260	dead	canid
4498	5/28/2008	550825	3892493	dead	canid
4528	4/30/2008	519532	3871333	dead	raven
4529	4/24/2008			dead	necropsy
4547	5/13/2008	547958	3887037	dead	raven
4586	8/2/2008	519495	3890762	dead	canid
4590	4/16/2008	547764	3890701	dead	necropsy
4593	5/10/2008	519388	3871613	dead	canid
4595	4/21/2008	549347	3890977	dead	canid
4598	7/25/2008	520787	3873341	dead	canid
4614	7/26/2008	521625	3871118	dead	canid
4650	9/17/2008	520301	3871499	dead	raven
4654	7/1/2008	517087	3892875	dead	unknown
4669	6/26/2008	526378	3889882	dead	unknown

4675	6/2/2008	524368	3889592	dead	canid
4684	4/24/2008	520440	3869962	dead	canid
4685	3/30/2008			dead	unknown
4716	9/21/2008	548017	3890871	dead	canid
4720	8/2/2008	520975	3890589	dead	canid
4721	3/25/2008	520811	3890811	dead	canid
4739	5/16/2008	542237	3877227	dead	raven
4756	5/16/2008	542617	3876834	dead	raven
5018	10/22/2008	513007	3897930	dead	unknown
5057	5/21/2008	514446	3898955	dead	unknown
5126	10/28/2008	508606	3898958	dead	canid
3141	11/17/2008	519367	3876075	injured	canid
2540	12/16/08	535854	3880651	injured	unknown
2557	12/08/08	508348	3880980	injured	unknown
4118	12/10/08	519040	3876002	injured	unknown
4291	12/10/08	514822	3878884	injured	unknown
4517	12/11/08	538655	3881274	injured	unknown

- Research – Reports outlining the 2008 activities, results, issues and recommendations for each research project associated with the Fort Irwin desert tortoise translocation effort are attached as appendices (A through E).
- Predator control – Predator control measures were implemented during summer 2008 in an attempt to reduce tortoise predation experienced by translocation research projects. See USDA APHIS (Animal and Plant Health Inspection Service) report, Appendix F.
- Fencing – Western Expansion Area (WEA) continued in 2008 in accordance with the fencing plan. Following discussion with Naval Air Weapons Station (NAWS) China Lake, Fort Irwin agreed to install tortoise fencing along the NAWS China Lake WEA boundary. Following a significant rain event numerous sections of the southern expansion area desert tortoise fence were repaired. A new tortoise fence design was developed to address overland flow issues during rain events. This design will undergo limited testing in 2009.
- On May 21<sup>st</sup> and 23<sup>rd</sup> 2008 four pens built to house diseased tortoises were surveyed and cleared. Any residents housed in these pens were removed to ensure they would not be subject to disease. These pens were cleared using United States Fish and Wildlife Service survey protocol. Three individuals were found. All were moved outside of their respective pens into a shady area nearby. Each was given water and a visual health assessment prior to release.
- On July 15<sup>th</sup> 2008 two biologists from DPW Environmental completed a tortoise survey in the western expansion area prior to the building of a tortoise boundary fence. The survey area was approximately 4.5 miles long and 20 meters wide. One burrow and one

carcass were discovered during this survey. The burrow was marked to ensure it would not be affected by construction. This project was monitored continually and two tortoises were moved out of harm's way during construction.

- In the spring of 2008 18 of the 73 juvenile tortoises (including 4 new tortoises from the WEA) overwintering in Bldg 602 on Fort Irwin were returned to the FISS by Fort Irwin biologists. The remaining 33 surviving tortoises from Bldg 602 were translocated by ITS researchers. With the addition of the 18 juvenile tortoises from Bldg 602 there are a total of 33 juvenile tortoises in the FISS.
- All three FISS structures were searched visually October 6, 2008 for any active individuals above ground. No juveniles were observed but scat littered the edges of pens 2, 3, and 4. This scat was still shiny dating it to this year (USFWS 1992). On October 14<sup>th</sup> 2008 pen 4 was intensively surveyed. There were no tortoises out walking around in this enclosure. Additionally, all burrows large enough to house a neonate tortoise were examined and no tortoises were found. In the summer of 2008 this pen was searched by a Fort Irwin biologist and no tortoises were observed.
- Pen 1 was surveyed on the 21<sup>st</sup> of October. No individuals were seen out walking around or in burrows. Pens 2 and 3 were examined October 28, 2008 and no individuals were seen. Pens 2 and 3 were irrigated during the summer months and Fort Irwin biologists reported seeing one or two individuals roaming the pens on multiple occasions. The identity of these individuals was not noted at that time. No burrow was prodded in order to avoid waking hibernating individuals. In spring of 2009 another survey will be conducted in order to confirm the fates of all juveniles at the FISS.

Summary of FISS Surveys:

Date	Survey Area	Juveniles	Scat	Burrows
10/6/08	Walked Pen 1, 2, 3, and 4	No	Yes (pens 1,2,3)	Yes
10/14/08	Pen 4, intensive burrow search	No	No	Yes
10/21/08	Pen 1, intensive burrow search	No	Yes	Yes
10/28/08	Pens 2 and 3, intensive burrow search	No	Yes	Yes

- On December 23<sup>rd</sup>, 24<sup>th</sup>, 29<sup>th</sup>, 30<sup>th</sup>, and 31<sup>st</sup> Fort Irwin biologists conducted a desert tortoise construction clearance survey in the western expansion area prior to work beginning on re-routing the existing Copper City Road. No tortoises were found. There were 13 desert tortoise carcasses encountered. Carcass locations were recorded and added to the Fort Irwin tortoise database.
- Lane Mountain Milkvetch - Conservation efforts for the Lane Mountain milkvetch consisted primarily of continued monitoring of populations at several sites. A complete annual report is attached (Appendix G).

### **B.O. # 1-8-00-F-78**

The Biological Opinion for the Proposed Off-Road Vehicle Area, U.S. Army National Training Center, Fort Irwin, California requires an annual report documenting ORV area usage and violations. Established in 2003, the ORV area encompasses approximately 70 acres. The ORV area is completely enclosed by triple strand smooth wire and tortoise proof fencing. During calendar year 2008, the Fort Irwin Recreation Center reported a total of 84 users of the OHV area which is less than in previous years. No desert tortoise encounters were reported within the boundaries of the OHV area. No violations of the NTC and Fort Irwin Regulation 350-3 were reported or observed.

### **B.O. # 1-8-05-F-43**

The Biological Opinion for Translocation of Desert Tortoises from the Southern Expansion Area requires Fort Irwin submit a report to the USFWS within 60 days of completion of activities outlined in the biological opinion. Construction of the I-15 tortoise exclusion fence and holding pens for diseased animals is complete. A final report detailing the effects of this action on desert tortoises is in preparation. Upon provision of this report to USFWS by the Army all provisions set forth by this biological opinion will have been fully satisfied.

### **B.O. # 1-8-03-F-47**

This project is still in progress with a tentative completion date of late February, 2009. Ground disturbance activities for this project were completed in 2007 and early 2008 with no tortoises, burrows or carcasses observed. A full report will be submitted, as required, within 90 days of project completion.

## **Literature Cited**

*Annual United States Fish and Wildlife Service report on the status of the desert tortoise at Fort Irwin.*  
2007. Signed by Lance Toyofuku.

USFWS. 1992. *Field Survey Protocol for any Federal and Non-federal Action That May Occur Within the Range of the Desert Tortoise.*