

ESCA RP at the Former Fort Ord

**Aquatic Feature Monitoring Data Sheet**

Observer(s): J. Tallis

Date: 1/5/2016

Begin Time: 0900

End Time: 0930

Weather: Raining

Location: Grenade Range Aquatic Features, Future East Garrison MRA

	Aquatic Feature Number		
	AF09-1A (Restored)	AF09-1B	AF09-2
Water present?	<u>Y/N</u>	<u>Y/N</u>	<u>Y/N</u>
Water depth at deepest point as measured on permanent gauge:	<u>1.20</u>	<u>.82</u>	<u>1.08</u>
If surface water not present indicate soil conditions:	saturated / moist / dry	saturated / moist / dry	saturated / moist / dry
Water turbidity:	None - Low - Med - <u>High</u>	None - Low - <u>Med</u> - High	None - Low - Med - <u>High</u>
Water pH:	<u>6.8</u>	<u>6.8</u>	<u>6.5</u>
Water surface area (sq. feet)	<u>500</u>	<u>50</u>	<u>200</u>
% ponded with submergent veg.:	<u>100</u>	<u>0</u>	<u>~ 50</u>
% ponded with emergent veg.:	<u>200</u>	<u>0</u>	<u>~ 150</u>
Plant species observed and other observations:	<u>Not recorded</u>		
Fauna species observed and other observations:	<u>- Tree frog egg masses</u>	<u>- red tiny worms</u>	<u>- tree frog egg masses - many -</u>
Other Observations:			
Notes:			

ESCA RP at the Former Fort Ord

Aquatic Feature Monitoring Data Sheet

Observer(s): J. Tallis

Date: 1/20/2016

Begin Time: 1300

End Time: 1330

Weather: cloudy, little rain

Location: Grenade Range Aquatic Features, Future East Garrison MRA

	Aquatic Feature Number		
	AF09-1A (Restored)	AF09-1B	AF09-2
Water present?	(Y) N	(Y) N	(Y) N
Water depth at deepest point as measured on permanent gauge:	1.34	.94	1.20
If surface water not present indicate soil conditions:	saturated / moist / dry	saturated / moist / dry	saturated / moist / dry
Water turbidity:	None - <u>Low</u> - Med - High	None - Low - <u>Med</u> - High	None - Low - <u>Med</u> - High
Water pH:	7.0	6.5	6.5
Water surface area (sq. feet)	700	100	200
% ponded with submergent veg.:	<sup>100</sup> ~200 (cloudy)	0	~100
% ponded with emergent veg.:	200	0	90
Plant species observed and other observations:	Not recorded on this visit		
Fauna species observed and other observations:	- water beetle → - water strider - <del>Tree frog</del> Tree frog larvae. - Tree frog larvae - water strider		
Other Observations:	Black phoebe present →		
Notes:	in vicinity		



ESCA RP at the Former Fort Ord

**Aquatic Feature Monitoring Data Sheet**

Observer(s): J. Tallis

Date: 3/8/2016

Begin Time: 12:30

End Time: 13:00

Weather: Overcast 55°F

Location: Grenade Range Aquatic Features, Future East Garrison MRA

	Aquatic Feature Number		
	AF09-1A (Restored)	AF09-1B	AF09-2
Water present?	(Y) N	(Y) N	(Y) N
Water depth at deepest point as measured on permanent gauge:	1.57 ft.	1.04 ft.	1.36 ft.
If surface water not present indicate soil conditions:	saturated / moist / dry	saturated / moist / dry	saturated / moist / dry
Water turbidity:	None - Low - Med - <u>High</u>	None - Low - <u>Med</u> - High	None - Low - Med <u>High</u>
Water pH:	7.2	6.5	6.5
Water surface area (sq. feet)	700-800	150	250
% ponded with submergent veg.:	too cloudy	5	Too cloudy to see.
% ponded with emergent veg.:	40	5	60
Plant species observed and other observations:	Mainly <i>Juncus pycnocephalus</i> , <i>S. libchans micropstachya</i> , <i>Trabellium</i> grass, Duck weed	<i>Juncus pycnocephalus</i>	Mainly <i>J. pycnocephalus</i> and <i>S. micropstachya</i> - Duck weed.
Fauna species observed and other observations:	- Flying water strider like insect - Pacific chorus frog larvae abundant (heard 100+) - caddis fly-like larvae	Water strider-like insect. water beetle (2mm)	- apparent leeches - 1" green insect larvae - Abundant Pacific chorus frog larvae (100+) and egg masses
Other Observations:			

Notes: Killdeer observed near aquatic features, and scrub jay

ESCA RP at the Former Fort Ord

Aquatic Feature Monitoring Data Sheet

Observer(s): JT Tallis  
also W. Ferren

Date: 4/26/2016

Begin Time: 0900

End Time: 10:00

Weather: Clear

Location: Grenade Range Aquatic Features, Future East Garrison MRA

	Aquatic Feature Number		
	AF09-1A (Restored)	AF09-1B	AF09-2
Water present?	(Y)N	Y(N)	Y(N)
Water depth at deepest point as measured on permanent gauge:	0.88 ft	—	—
If surface water not present indicate soil conditions:	saturated / moist / dry	saturated / moist / (dry)	saturated (moist) / dry
Water turbidity:	(None) Low - Med - High	None - Low - Med - High	None - Low - Med - High
Water pH:	6.0	—	—
Water surface area (sq. feet)	300	—	—
% ponded with submergent veg.:	70	—	—
% ponded with emergent veg.:	25	—	—
Plant species observed and other observations:	Callitriche sp. Triglochin Scilloides Eleocharis microstachya Juncus phaecephalus	<del>J. butanensis</del> J. phaecephalus J. occidentalis Eleocharis acicularis	Juncus phaecephalus, Eleocharis macrostachya, Juncus occidentalis, J. butanensis Crassula aquatica
Fauna species observed and other observations:	Crassula aquatica J. occidentalis Leothemia sp Deschampsia dentonoides		
Other Observations:	specific chorus frog larvae		
Notes:			



ESCA RP at the Former Fort Ord

**Aquatic Feature Monitoring Data Sheet**

Observer(s): *J. Tallis*

Date: *5/27/2016*

Begin Time: *0920*

End Time: *0935*

Weather: *Clear Morning massive fog*

Location: Grenade Range Aquatic Features, Future East Garrison MRA

	Aquatic Feature Number		
	AF09-1A (Restored)	AF09-1B	AF09-2
Water present?	Y/ <u>N</u>	Y/ <u>N</u>	Y/ <u>N</u>
Water depth at deepest point as measured on permanent gauge:	—	—	—
If surface water not present indicate soil conditions:	saturated / moist / <u>dry</u>	saturated / moist / <u>dry</u>	saturated / moist / <u>dry</u>
Water turbidity:	None - Low - Med - High	None - Low - Med - High	None - Low - Med - High
Water pH:	—	—	—
Water surface area (sq. feet)	—	—	—
% ponded with submergent veg.:	—	—	—
% ponded with emergent veg.:	—	—	—
Plant species observed and other observations:	<i>No new species - Juncus pyenocephalus spreading quickly</i>		
Fauna species observed and other observations:			
Other Observations:			
Notes:			

ESCA RP at the Former Fort Ord

Aquatic Feature Monitoring Data Sheet

Observer(s): J. Tallis

Date: 10/3/2010

Begin Time: 09:45

End Time: 09:55

Weather: Partly cloudy, light rain, 65°F

Location: Grenade Range Aquatic Features, Future East Garrison MRA

	Aquatic Feature Number		
	AF09-1A (Restored)	AF09-1B	AF09-2
Water present?	Y/N	Y/N	Y/N
Water depth at deepest point as measured on permanent gauge:	—	—	—
If surface water not present indicate soil conditions:	saturated / moist / dry	saturated / moist / dry	saturated / moist / dry
Water turbidity:	None - Low - Med - High	None - Low - Med - High	None - Low - Med - High
Water pH:	—	—	—
Water surface area (sq. feet)	—	—	—
% ponded with submergent veg.:	—	—	—
% ponded with emergent veg.:	—	—	—
Plant species observed and other observations:	see prior data sheets. No new species observed. Plants are quite dry.		
Fauna species observed and other observations:	Deer tracks in previously wet mud observed.		
Other Observations:			
Notes:			



ESCA RP at the Former Fort Ord

**Aquatic Feature Monitoring Data Sheet**

Observer(s): *J. Tallis*

Date: *10:10<sub>3</sub> Nov 1, 2016*

Begin Time: \_\_\_\_\_ End Time: \_\_\_\_\_

Weather: *Partly cloudy; 60°F, Rain in past 24 hours*

Location: Grenade Range Aquatic Features, Future East Garrison MRA

	Aquatic Feature Number		
	AF09-1A (Restored)	AF09-1B	AF09-2
Water present?	<i>(Y) N</i>	<i>Y (N)</i>	<i>(Y) N</i>
Water depth at deepest point as measured on permanent gauge:	<i>0.64 ft</i>	<i>-</i>	<i>0.68 feet</i>
If surface water not present indicate soil conditions:	<i>saturated / moist / dry</i>	<i>saturated / (moist) / dry</i>	<i>saturated / moist / dry</i>
Water turbidity:	<i>None (Low) Med - High</i>	<i>None - Low - Med - High</i>	<i>None - Low (Med) - High</i>
Water pH:	<i>7.2</i>	<i>-</i>	<i>6.0</i>
Water surface area (sq. feet)	<i>300</i>	<i>-</i>	<i>100</i>
% ponded with submergent veg.:	<i>5%</i>	<i>-</i>	<i>5%</i>
% ponded with emergent veg.:	<i>0.5%</i>	<i>-</i>	<i>30%</i>
Plant species observed and other observations:	<i>Calandrinia Salix Plantago coronopus</i>	<i>UnID grass blades</i>	<i>New Plantago coronopus UnID new blades of a grass and Eleocharis sp.</i>
Fauna species observed and other observations:	<i>Water beetle same</i>	<i>same</i>	<i>Tree frog adult audible No larva or eggs</i>
Other Observations:	<i>Many chaparral birds around all aquatic features (Calif scrub jay, California towhee)</i>		
Notes:			

ESCA RP at the Former Fort Ord

Aquatic Feature Monitoring Data Sheet

Observer(s): J. Tallis

Date: 11/23/2016

Begin Time: 10:30

End Time: 11:00

Weather: Partly cloudy

Location: Grenade Range Aquatic Features, Future East Garrison MRA

	Aquatic Feature Number		
	AF09-1A (Restored)	AF09-1B	AF09-2
Water present?	(Y) N	Y (N)	(Y) N
Water depth at deepest point as measured on permanent gauge:	0.64 ft		0.78 ft.
If surface water not present indicate soil conditions:	saturated / moist / dry	saturated / moist / dry	saturated / moist / dry
Water turbidity:	None - Low - (Med) - High	None - Low - Med - High	None (Low) - Med - High
Water pH:	6.5		6.5
Water surface area (sq. feet)	250		90
% ponded with submergent veg.:	50%		2%
% ponded with emergent veg.:	5%		15%
Plant species observed and other observations:	- <i>Juncus phaecephalus</i> growing well - <i>Heteromeles arbutifolia</i>		
Fauna species observed and other observations:	Hyla eggs, calls, and larvae. Black fly present. water beetle		
Other Observations:			
Notes:			



Aquatic Feature Monitoring Data Sheet

Observer(s): J. Tallis

Date: 12/12/2016

Begin Time: 11:30 - 12 pm

End Time: 12 pm

Weather: Light rain

Location: Grenade Range Aquatic Features, Future East Garrison MRA

	Aquatic Feature Number		
	AF09-1A (Restored)	AF09-1B	AF09-2
Water present?	(Y) N	Y (N)	(Y) N
Water depth at deepest point as measured on permanent gauge:	0.94 ft	—	1.18 ft.
If surface water not present indicate soil conditions:	saturated / moist / dry	saturated (moist) / dry	saturated / moist / dry
Water turbidity:	None - Low - (Med) - High	None - Low - Med - High	(None) - Low - Med - High
Water pH:	—	—	—
Water surface area (sq. feet)	400		150
% ponded with submergent veg.:	20%		10%
% ponded with emergent veg.:	25%		15%
Plant species observed and other observations:	New rooted floating plant covering much of surface. Likely Callitriche sp. Callitriche ciliata.		
Fauna species observed and other observations:	Red worms		Hyla egg masses
Other Observations:			

Notes:

Blank lines for notes.

Table C-1  
2016 Aquatic Feature Monitoring in the Future East Garrison MRA Grenade Range

ESCA RP 2016 Annual Natural Resources Report

Date	Aquatic Feature Number	Water depth (ft.)	Turbidity	pH	Percent Emergent and Submergent Vegetation**	New or Unusual Flora Observed	Fauna Observed	CTS present?	CA Linderiella present?	Aquatic Invertebrates Present?	Total Rainfall During Last 7 days (in.)	Total Rainfall Since Last Monitoring Event (in.)	Total Rainfall Year to Date (in.)
1/5/2016	AF09-1A*	1.2	High	6.8	40% emergent; 20% submergent	-	Pacific tree frog egg masses, water beetles	no	no	yes	0.14	2.19	6.33
	AF09-1B	0.82	Medium	6.8	0% emergent; 0% submergent	-	tiny red worms	no	no	yes			
	AF09-2	1.08	High	6.5	75% emergent; 25% submergent	-	Pacific tree frog egg masses (many), water beetles	no	no	yes			
1/20/2016	AF09-1A*	1.34	Low	7	28% emergent; 14% submergent	-	Pacific tree frog larvae, water beetle, water strider, black phoebe	no	no	yes	2.17	3.28	10.55
	AF09-1B	0.94	Medium	6.5	0% emergent; 0% submergent	-	water beetle, water strider, black phoebe	no	no	yes			
	AF09-2	1.2	Medium	6.5	45% emergent; 50% submergent	-	Pacific tree frog larvae, water beetle, black phoebe	no	no	yes			
3/8/2016	AF09-1A*	1.57	High	7.2	too turbid	<i>Juncus phaeocephalus, Eleocharis macrostachya, Tribolium obliterum, Lemna minuta</i>	flying water strider-like insect, Pacific tree frog larvae (abundant), caddis fly larvae, killdeer, scrub jay	no	no	yes	3.24	5.78	16.35
	AF09-1B	1.04	Medium	6.5	3% emergent; 3% submergent	<i>Juncus phaeocephalus</i>	flying water strider-like insect, water beetle, killdeer, scrub jay	no	no	yes			
	AF09-2	1.36	High	6.5	too turbid	<i>Juncus phaeocephalus, Eleocharis macrostachya, Lemna minuta</i>	1" long green insect larvae, Pacific tree frog larvae (100+) and egg masses (abundant), killdeer, scrub jay	no	no	yes			
4/26/2016	AF09-1A*	0.88	Low	6	8% emergent; 23% submergent	<i>Callitriche sp., Triglochin scilloides, Lasthenia sp., Deschampsia danthonioides</i>	Pacific tree frog larvae	no	no	yes	0.2	1.59	17.96
	AF09-1B	0	-	-	-	<i>Juncus bufonius, Juncus occidentalis, Eleocharis acicularis</i>	-	no	no	no			
	AF09-2	0	-	-	-	<i>Juncus phaeocephalus, Eleocharis macrostachya, Juncus occidentalis, J. bufonius, Crassula aquatica</i>		no	no	no			
5/27/2016	AF09-1A*	0	-	-	-	No new species. <i>Juncus phaeocephalus</i> spreading quickly	none	no	no	no	0	0.21	18.17
	AF09-1B	0	-	-	-	-	none	no	no	no			
	AF09-2	0	-	-	-	-	none	no	no	no			



Table C-1  
2016 Aquatic Feature Monitoring in the Future East Garrison MRA Grenade Range

ESCA RP 2016 Annual Natural Resources Report

Date	Aquatic Feature Number	Water depth (ft.)	Turbidity	pH	Percent Emergent and Submergent Vegetation**	New or Unusual Flora Observed	Fauna Observed	CTS present?	CA Linderiella present?	Aquatic Invertebrates Present?	Total Rainfall During Last 7 days (in.)	Total Rainfall Since Last Monitoring Event (in.)	Total Rainfall Year to Date (in.)
<b>Aquatic Features Dry From Spring-Fall 2016</b>													
10/3/2016	AF09-1A*	0	-	-	-	-	deer tracks observed in previously wet mud.	no	no	no	0	0.17	0
	AF09-1B	0	-	-	-	-	none	no	no	no			
	AF09-2	0	-	-	-	-	none	no	no	no			
11/1/2016	AF09-1A*	0.64	Low	7.2	0.5% emergent; 5% submergent	<i>Calandrinia ciliata</i> , <i>Lythrum hyssopifolia</i> , <i>Salix lasiolepis</i> , <i>Plantago coronopifolia</i> , <i>UnID grass seedlings</i> , <i>UnID floating algae</i>	Tree frog adult audible, black water beetle, many central maritime chaparral bird species (Calif. towhee, Calif. scrub jay)	no	no	yes	1.33	2.32	2.32
	AF09-1B	0	-	-	-	UnID grass seedlings	Tree frog adult audible, many central maritime chaparral bird species (Calif. towhee, Calif. scrub jay)	no	no	no			
	AF09-2	0.68	Medium	6	30% emergent; 5% submergent	<i>Plantago coronopifolia</i> , <i>UnID grass and spike rush seedlings</i>	Tree frog adult audible, many central maritime chaparral bird species (Calif. towhee, Calif. scrub jay)	no	no	no			
11/23/2016	AF09-1A*	0.64	Medium	6.5	5% emergent; 50% submergent	<i>Heteromeles arbutifolia</i> (at high waters edge alongside <i>Salix lasiolepis</i> ), <i>Juncus phaeocephalus</i>	Hyla eggs, larvae, and adult calls. Black flies on water surface. Water beetles.	no	no	yes	0.61	0.68	3.15
	AF09-1B	0	-	-	-	-	-	no	no	no			
	AF09-2	0.78	Low	6.5	15% emergent; 2% submergent	-	Hyla eggs, larvae, and adult calls.	no	no	no			
12/12/2016	AF09-1A*	0.94	Medium	-	25% emergent; 20% submergent	New rooted but floating plant, likely young <i>Callitriche sp.</i> ; <i>Calandrinia ciliata</i> .	Tiny aquatic red worms	no	no	no	0.48	1.63	4.79
	AF09-1B	-	-	-	-	-	-	no	no	no			
	AF09-2	1.18	None	-	15% emergent; 10% submergent	-	Hyla egg masses	no	no	no			

Notes:  
 \* Restored Aquatic Feature  
 \*\* Percent vegetative cover is based on visual estimate and is affected by water turbidity.

Table C-2  
2016 Aquatic Feature Monitoring in the Future East Garrison MRA Grenade Range

ESCA RP 2016 Annual Natural Resources Report

Survey	Aquatic Feature Number	Water depth (ft.)			Turbidity**			pH			Percent Emergent and Submergent Vegetation***		
		2010	2011	2016	2010	2011	2016	2010	2011	2016	2010	2011	2016
		Total annual precipitation: 2010 = 23.6 inches, 2011 = 16.6 inches, 2016 = 15.0 inches											
1/13/2010; 1/31/2011; and 1/20/2016	AF09-1A*	inundated	0.78	1.34	-	Low	Low	-	-	7	-	-	28% emergent; 14% submergent
	AF09-1B	-	0.14	0.94	-	N/A	Medium	-	-	6.5	-	-	0% emergent; 0% submergent
	AF09-2	inundated	0.94	1.2	-	Medium	Medium	-	-	6.5	-	-	45% emergent; 50% submergent
3/12/2010; 3/28- 29/2011 and 3/8/2016	AF09-1A*	0.94	0.98	1.57	Low	Low	High	-	6.62	7.2	-	-	too turbid
	AF09-1B	0.34	0.49	1.04	Medium	Medium	Medium	-	6.86	6.5	-	-	3% emergent; 3% submergent
	AF09-2	1.08	1.08	1.36	Medium	Medium	High	-	6.12	6.5	-	-	too turbid
4/15/2010; 4/21/2011 and 4/26/2016	AF09-1A*	0.96	0.46	0.88	Medium	Low	Low	6.36	-	6		28.5% emergent; 10% submergent	8% emergent; 23% submergent
	AF09-1B	0.44	0	0	High	-	-	6.36	-	-		0% submergent	-
	AF09-2	1.06	0	0	High	-	-	6.07	-	-		-	-

Notes:

\* Restored Aquatic Feature

\*\* During baseline monitoring field crews used a turbidity meter that measured in nephelometric turbidity units (NTU). During post disturbance monitoring a simpler method was used. "Low" turbidity ranged from 0-30 NTU, and is comparable to a relatively clear lake (Nathanson, 2003). "Medium" turbidity ranged from 30-100 NTU. "High" turbidity is greater than 100 NTU and is comparable to muddy water (Joyce, 1996).

\*\*\* Percent cover is based on visual estimate and is affected by water turbidity.

References:

Joyce, T.M. et al. 1996. Inactivation of Fecal Bacteria in Drinking Water by Solar Heating. Applied and Environmental Microbiology: Volume 62 (2), pages 399-402.

Nathanson, Jerry A. 2003. Basic Environmental Technology: Water Supply, Waste Management, and Pollution Control. Upper Saddle River, New Jersey: Prentice Hall.



## Appendix C – Aquatic Feature Monitoring and Maintenance Photo-documentation



**Photograph 1**

**Location:** Future East Garrison (FEG) Munitions Response Area (MRA), Grenade Range

**Description:** Aquatic Feature AF09-2 during wet season

**Date:** 21 March 2016



**Photograph 2**

**Location:** FEG MRA, Grenade Range

**Description:** Aquatic Feature AF09-2 during dry season

**Date:** 3 October 2016

FORA ESCA Remediation Program





## Appendix C – Aquatic Feature Monitoring and Maintenance Photo-documentation



**Photograph: 3**

**Location:**  
FEG MRA,  
Grenade Range

**Description:**  
Aquatic Feature  
AF09-1B during  
wet season

**Date:** 21 March  
2016



**Photograph 4**

**Location:**  
FEG MRA,  
Grenade Range

**Description:**  
Aquatic Feature  
AF09-1B during dry  
season

**Date:** 3 October  
2016

FORA ESCA Remediation Program



## Appendix C – Aquatic Feature Monitoring and Maintenance Photo-documentation



**Photograph 5**

**Location:**  
FEG MRA,  
Grenade Range

**Description:**  
Restored Aquatic  
Feature AF09-1A  
during wet season

**Date:** 21 March  
2016



**Photograph 6**

**Location:**  
FEG MRA,  
Grenade Range

**Description:**  
Restored Aquatic  
Feature AF09-1A  
shortly after surface  
water dried

**Date:** 27 May 2016

FORA ESCA Remediation Program



## Appendix C – Aquatic Feature Monitoring and Maintenance Photo-documentation



**Photograph 5**

**Location:**  
FEG MRA,  
Grenade Range

**Description:**  
Restored Aquatic  
Feature AF09-1A  
during fall

**Date:** 3 October  
2016



**Photograph 6**

**Location:**  
FEG MRA,  
Grenade Range

**Description:**  
Restored Aquatic  
Feature AF09-1A  
beginning to fill for  
2016-2017 wet  
season. Adult  
Pacific chorus frogs  
audible.

**Date:** 1 November  
2016

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