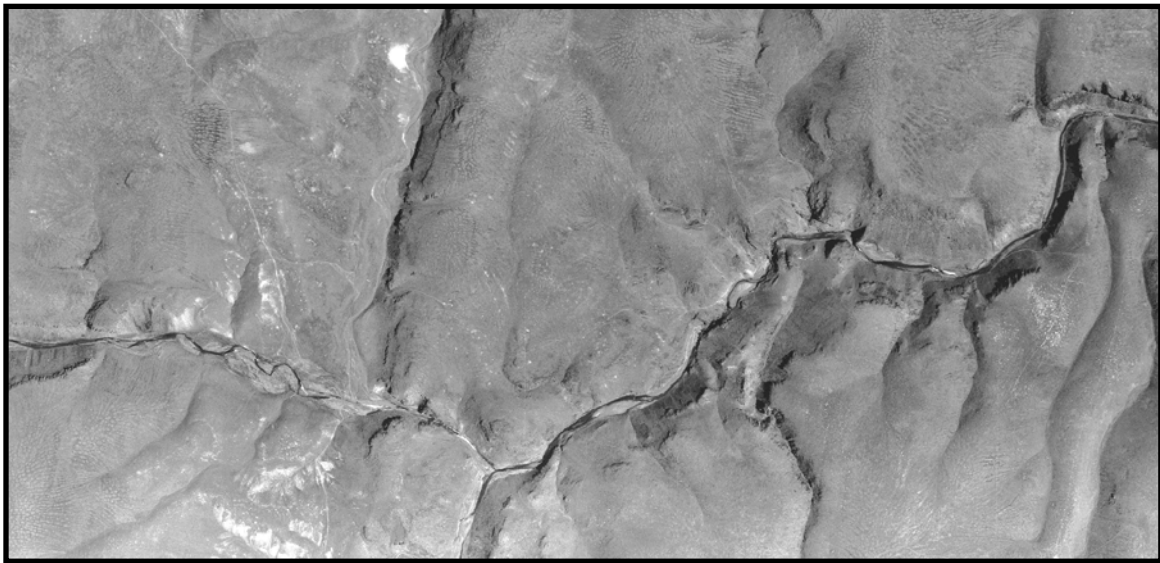




Columbia Spotted Frog
(Rana luteiventris)
2001 Monitoring Report

Dry Creek, Oregon



**Prepared for the Vale District
Bureau of Land Management**

**by
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November 2001

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Introduction

This report summarizes the results of the first year of the Dry Creek Monitoring project for Columbia spotted frogs, with incidental observations of other herpetofauna. The protocol followed for this survey is described in the 2000 monitoring proposal (Appendix I).

Dry Creek is characterized by steep canyons, scour pools, and narrow reaches with boulders, cobbles, and a sandy substrate (Figure 1). Occasional oxbow and sidebow pools (Figure 2) provide slack water for frog breeding and tadpole development, but deep pools with vertical canyon walls (Figure 3) contain large trout and could negatively affect continuous movement of frogs along the creek between breeding, foraging, and hibernation sites. The summer of 2001 was considered a drought year,



Figure 1. Dry Creek survey site.



Figure 2. Oxbow pool.



Figure 3. Deep pool with trout.

with aquatic habitat frequently becoming intermittent, isolated, and relatively warm. Several stretches along the survey transect became dry (Figure 4) and livestock grazing



Figure 4. Dry stretch in August.



Figure 5. Livestock grazing in the riparian area.

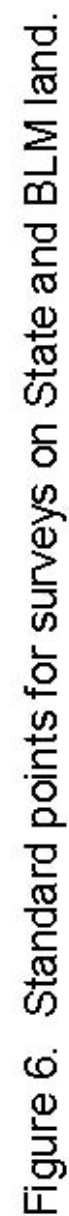
removed vegetation from the riparian corridor in August (Figure 5).

Dry Creek was visited twice this summer, from June 6 through June 9 to conduct the mark-recapture survey (four days to make two complete passes), determine breeding sites, and measure habitat parameters; and then on August 4 to determine annual recruitment success and to measure habitat parameters again. Standard GPS points were determined for all subsequent surveys (Table 1). The photo point is at the edge of the rocky outcrop, just north of Dry Creek, facing downstream, and the start and finish points are both along the creek, at the boundary between state and private land, and at the beginning of a large canyon, respectively (Figure 6). Additionally, the BLM land at the road crossing west of the survey site was surveyed from the

road crossing west for ½ mile to the boundary with private land in August. This BLM section will be included in future surveys.

Table 1. Standard survey points for the Dry Creek monitoring site (NAD 27, Zone 11).

	UTM E	UTM N
Start/ water chemistry	442073	4816978
Photo point	442164	4817129
Finish	443909	4818069
BLM land – upstream	440797	4817011



Monitoring Results

Date	Time	Water temp	DO	Con	pH	SSAR	SVSR	VUBA	L-P Population Estimate	Recruitment
6 Jun	1310	17.3C	14.65	191.5	9.2	1-25%	4	0-25%	74	-
4 Aug	1335	22.3	16.46	246.4	9.3	26-50%	2	76-100%	NA	yes

(for description of habitat measures, see Appendix I.)



Figure 7. Dry Creek standard photo point, June 6, 2001.

We began our survey of the Dry Creek transect on June 6, 2001 at 1310 hrs. The standard photo was taken at 1300 hrs from the bluff above the creek, facing toward the survey area (Figure 7). Proceeding east from the start point, we surveyed to the area below the campsite in three hours (1605 hrs). One short stream segment of particular interest appeared to be a “natural enclosure” to livestock because of the rocky outcrops and cliffs on both sides of the creek (Figures 8a and 8b). No manure was observed within this area and there were cattails and willows, not present elsewhere along the survey transect. It is likely that many more frogs were present there, because it was very difficult to spot and capture frogs amongst the thick vegetation. We ended the survey on the first day at the “second pinch”, immediately downstream from the “natural enclosure”.

The second day we completed the first pass of the mark-recapture survey, starting at the second pinch at 1012 and stopping at the finish point at 1612. Most of the frogs observed were in oxbows and sidebows, not in the creek itself. Frequently, small stream fish were

noted with a fungus that resulted in the posterior half of their bodies affected. Dead fish were observed also, and samples were collected for analysis (results unknown as of this time). Large crayfish were commonly observed in the stream, and remains were scattered along streambanks (from predators). Thirty-three spotted frogs were marked with Passive Integrated Tags (PIT-tags) during the first pass and 59 garter snakes were observed along the riparian corridor.

The second pass was completed on days 3 and 4 (8 and 9 June). Frogs did not appear to have moved from capture locations on the first pass. Twenty-nine spotted frogs were captured, 13 of which were recaptures from the first pass. (Lincoln-Peterson estimate calculation: $33 \times 29 / 13 = 74$). Only two adult males and ten adult females were captured and PIT-tagged; all of the rest appeared to be juveniles, probably from the 2000 cohort.

Many of the oxbow and sidebow pools had thick layers of manure floating at the surface at the downstream (or downwind) ends. The accumulation was probably due to higher flows immediately after snowmelt that left the floating mats stranded when the water receded. Oftentimes, subadults would be found in these small oxbows.

Two pools appeared to be breeding sites because of the high densities of tadpoles. However, both sites were connected to the main creek and therefore cannot be labeled with complete certainty because no egg masses were observed. Site 1 was along the edge of a large scour pool with emergent vegetation on the south side, and Site 2 was in a sidebow pool on the north side of the creek. Figure 9 shows the capture points of all adults and subadults, as well as the locations of the breeding sites.



Figure 8a. Natural enclosure as seen from the cliff above (facing downstream).



Figure 8b. Natural enclosure as seen from water level (facing upstream).

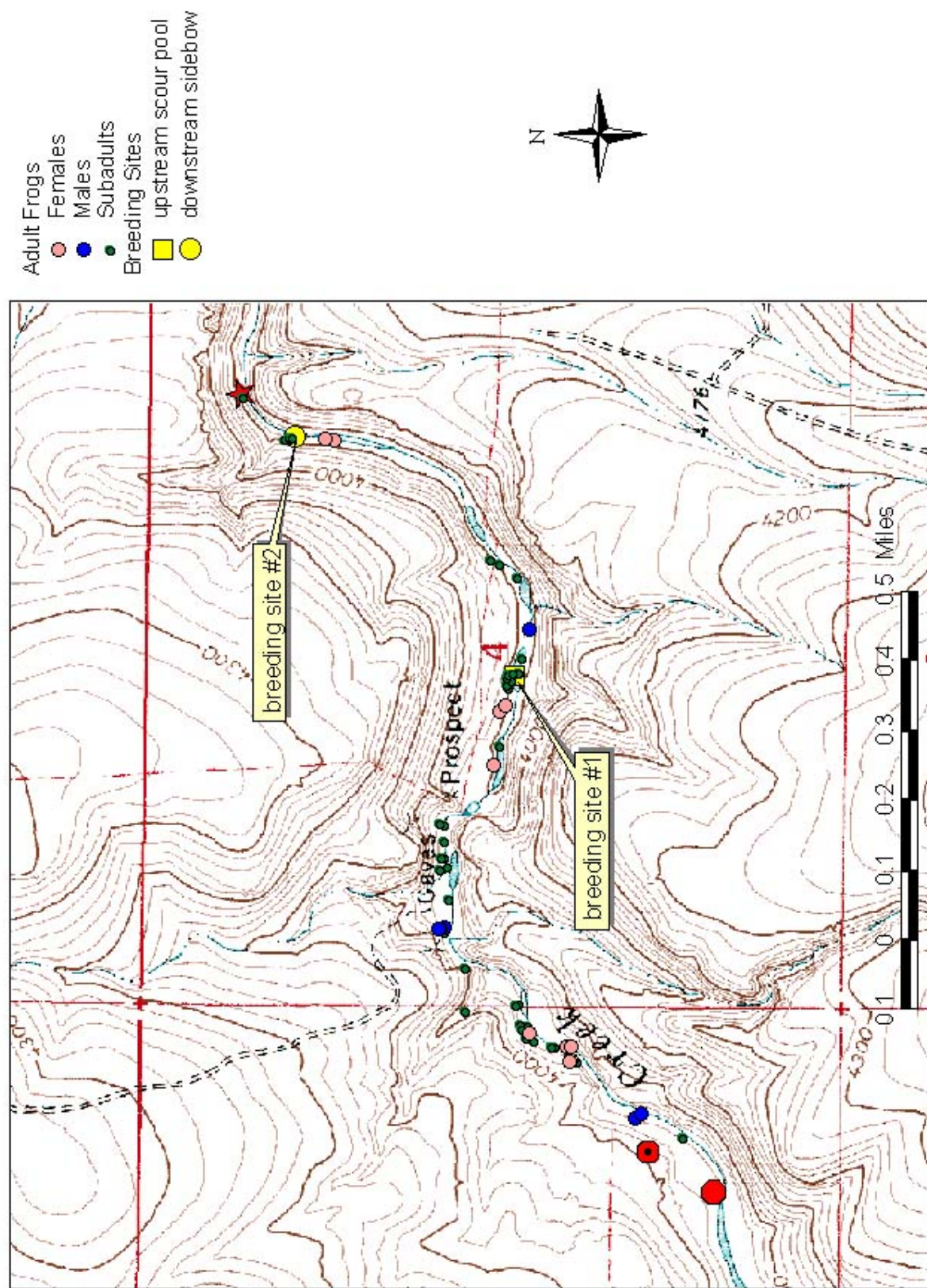


Figure 9. June survey results.

map prepared by Janice Engle
November 8, 2001

On August 4 (Figure 10), we collected water chemistry data and habitat ratings, and surveyed for recruitment based on breeding success. None of the adults captured in the June survey were recaptured in August. Two subadults were recaptured and classified as adult females. Four other adults were observed (two males and two females). It is likely that many of the subadults captured in June were lost to predation (garter snakes), but it is



Figure 10. Dry Creek standard photo point, August 4, 2001.

unknown why none of the adults were recaptured. Other factors affecting survival could include crayfish predation on eggs and larvae, water quality, availability of insect prey, climate, habitat loss due to drought, disease, parasites, and habitat conditions due to livestock use.

Many metamorphs were observed in August (38 were toe-clipped), confirming that there was successful reproductive recruitment. Although tadpoles were confined to limited breeding areas in June, metamorphs were captured along the entire survey transect in August (Figure 11). The extent to which adult frogs migrate in the Dry Creek survey area is unknown, but recapture data over several years should yield some insight into individual movement patterns. Preliminary observations suggest that movement may be limited by the geologic features that provide a predatory advantage (vertical-walled deep pools with large fish and no vegetative cover for frogs or tadpoles). Hibernation sites are unknown. Subsequent annual surveys may help determine the population demographic with greater certainty, but based on initial results, this population appears to have a high annual turnover rate.

Table 2 lists the other herpetofauna observed, except for garter snakes (*Thamnophis elegans*) and Pacific treefrogs (*Hyla regilla*) which were not mapped because of high observance frequencies. All 2001 capture data is recorded in Appendix III.

Table 2. Other herpetofauna.

date	hour	length	species	UTME	UTMN	comments
6-Jun-01	1248		<i>Coluber constrictor</i>	442427	4817548	
6-Jun-01	1259		<i>Pituophis catenifer</i>	442201	4817175	
6-Jun-01	1852		<i>Sceloporus occidentalis</i>	442671	4817752	at campsite
7-Jun-01	1439		<i>Pituophis catenifer</i>	443499	4817448	
7-Jun-01	1520		<i>Coluber constrictor</i>	443909	4818119	75m north of endpoint
9-Jun-01	925	~24"	<i>Crotalus viridis</i>	442793	4817850	on west-facing slope
9-Jun-01	950	~42"	<i>Crotalus viridis</i>	443011	4817493	along stream, drinking water

Water chemistry and land use ratings were collected to use as a baseline in future trend analyses. Data combined over a period of several years will be analyzed to determine the effects of climatic fluctuations and land use practices on spotted frog population trends.

I recommend that the photo and water sampling points be moved to the section of Dry Creek immediately below the campsite/parking area in subsequent years. This move would require less stress on the equipment. I believe that the poor photo quality is due to the fact that the film got too hot.

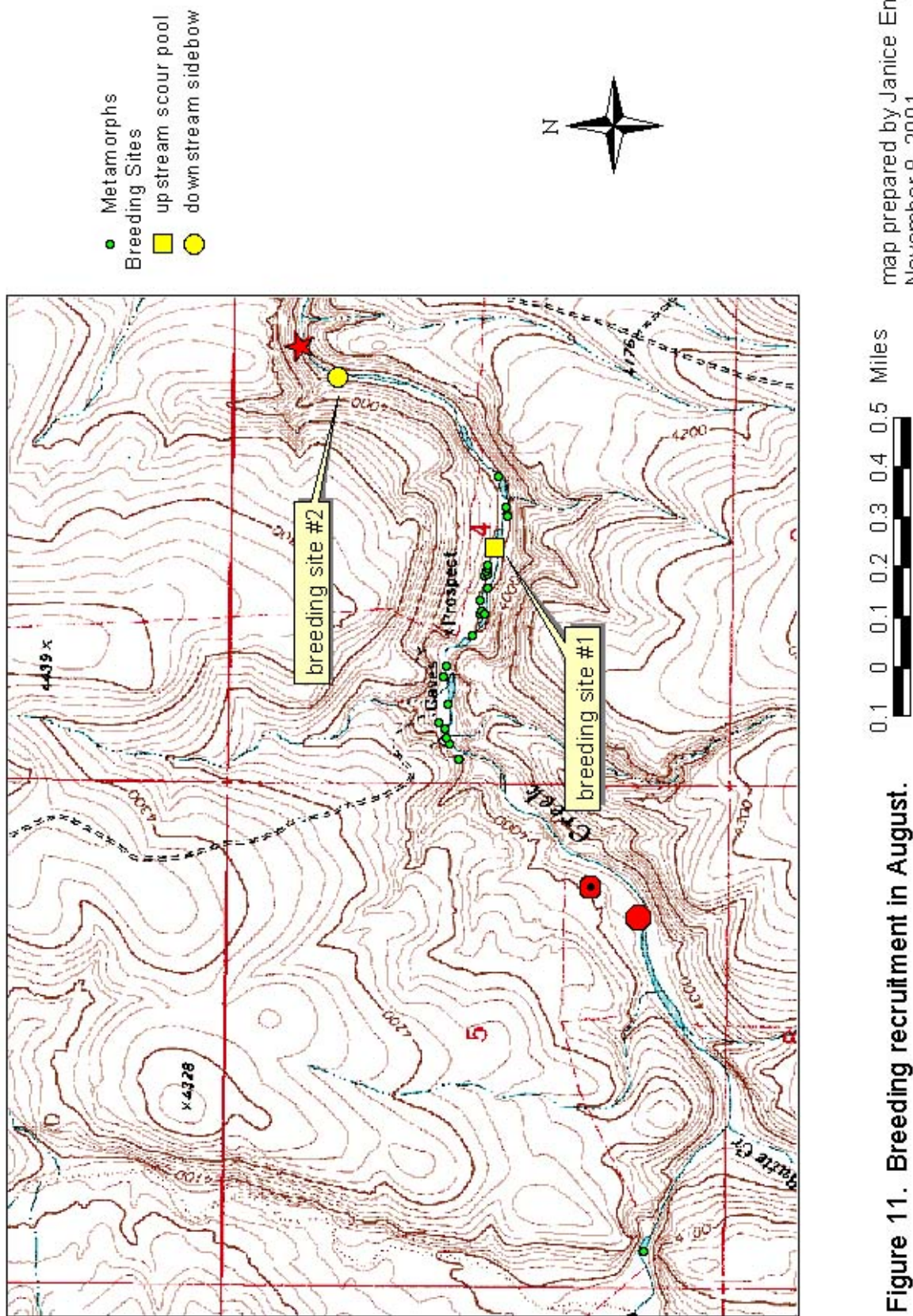


Figure 11. Breeding recruitment in August.

APPENDIX I.

MONITORING METHODS

Two population estimate methods will be used in this Monitoring Plan: mark-recapture and visual encounter surveys. Mark-recapture methods can provide accurate estimates of population size within the constraints of the following assumptions: boundaries must be accurately assessed, and ideally, immigration and emigration must not exist, and births and deaths must not occur. Visual encounter surveys provide an estimate of relative abundance as long as every individual is equally likely to be observed regardless of weather, season, or other variables; each frog is recorded only once; and there are no observer-related effects. These two methods will be used to provide comparative numbers across 10 years for the Dry Creek monitoring site. The goal is to accurately detect trends in numbers at the site over the long-term. Mark-recapture numbers will be used to calculate the Lincoln Index (Peterson Estimate) to estimate *occurrence size* in the spring and visual encounter numbers to assess *breeding success* in the late summer. The Lincoln-Peterson Index is calculated as follows:

$$N=rm/m$$

N=occurrence size

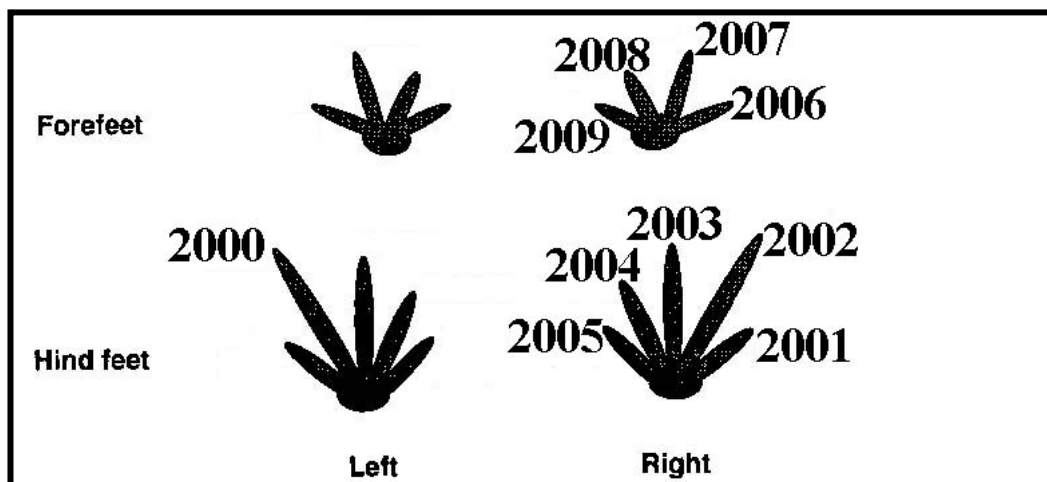
r=number of frogs caught, marked, and released on day #1

n=number of frogs caught on day #2

m=total number of marked frogs caught on day #2

For example, if on the first day 30 frogs are captured, marked, and released and on the second day, 28 frogs are caught, of which 20 had been previously marked, then using the equation, $N=(30)(28)/20$, $N=42$.

Two people will visit the site three times each year - twice in the spring for a mark-recapture population estimate and habitat analysis and once in the late summer for an assessment of breeding success and habitat analysis. Beginning and ending points (determined by ownership, accessibility, and occurrence boundaries from previous surveys) will be staked and flagged, and GPS locations will be recorded at the first survey in the spring of 2001. Attempts will be made to capture every frog within the delimited area within a specified time frame. Frogs will be toe-clipped according to the Hero toe-clipping system (or tagged with Passive Integrated Transponder tags, if available). All clips will represent the year of capture:



Parameters to be measured at each monitoring site, once in the spring and once in the late summer include:

- Water chemistry: dissolved oxygen, temperature, pH, and conductivity
- Habitat/land use: streambank alteration, vegetative stability, and vegetation use by animals (Platts 1987).

Data will be recorded in a standard log book. The site will be photographed in the spring and late summer from a standard point (to be staked and flagged in the spring of 2001).

A report will be compiled annually and submitted to the BLM. The report will consist of tables summarizing population numbers and maps of the area surveyed. Water chemistry and habitat/land use measures will be discussed along with their relevance to population trends. Raw data and field notes will be included as appendices.

APPENDIX II

Habitat/Land Use Ratings

FROM:

Platts W. S. 1987. Methods for evaluating riparian habitat with applications to management.
USFS Intermountain Forest and Range Experiment Station. Ogden, Utah. GTR INT-221.

Streambank soil alteration rating (SSAR)

Rating (%)	Description
0	Streambanks are stable and are not being altered by water flows or animals.
1-25	Streambanks are stable, but are being lightly altered along the transect line. Less than 25% of the streambank is receiving any kind of stress and if stress is being received, it is very light. Less than 25% of the streambank is false, broken down, or eroding.
26-50	Streambanks are receiving only moderate alteration along the transect line. At least 50% of the streambank is in a natural stable condition. Less than 50% of the streambank is false, broken down, or eroding. False banks are rated as altered. Alteration is rated as natural, artificial, or a combination of the two.
51-75	Streambanks have received major alteration along the transect line. Less than 50% of the streambank is in a stable condition. Over 50% of the streambank is false, broken down, or eroding. A false bank that may have gained some stability and cover is still rated as altered. Alteration is rated as natural, artificial, or a combination of the two.
76-100	Streambanks along the transect line are severely altered. Less than 25% of the streambank is in a stable condition. Over 75% of the streambank is false, broken down, or eroding. A past damaged bank, now classified as a false bank, that has gained some stability and cover is still rated as altered. Alteration is rated as natural, artificial, or a combination of the two.

Streambank vegetative stability rating (SVSR)

Rating	Description
4 (excellent)	Over 80% of the streambank surfaces are covered by vegetation in vigorous condition or by boulders and rubble. If the streambank is not covered by vegetation, it is protected by materials that do not allow bank erosion.
3 (good)	50-79% of the streambank surfaces are covered by vegetation or by gravel or larger material. Those areas not covered by vegetation are protected by materials that allow only minor erosion.
2 (fair)	25-49% of the streambank surfaces are covered by vegetation or by gravel or larger material. Those areas not covered by vegetation are covered by materials that give limited protection.
1 (poor)	Less than 25% of the streambank surfaces are covered by vegetation or by gravel or larger material. That area not covered by vegetation provides little or no control over erosion and the banks are usually eroded each year by high water flows.

APPENDIX II (continued)

Vegetation use by animals (VUBA)

Rating (%)	Description
0-25 (light)	Vegetation use is very light or none at all. Almost all of the potential plant biomass at present stage of development remains. The vegetative cover is very close to that which would occur naturally without use. If bare areas exist (i.e., bedrock), they are not because of loss of vegetation from past grazing use.
26-50 (moderate)	Vegetation use is moderate and at least one-half of the potential plant biomass remains. Average plant stubble height is greater than half of its potential height at its present stage of development. Plant biomass no longer on site because of past grazing is considered as vegetation that has been used.
51-75 (high)	Vegetative use is high and less than half of the potential plant biomass remains. Plant stubble height averages over two inches. Plant biomass no longer on site because of past grazing is considered as vegetation that has been used.
76-100 (very high)	Use of the streamside vegetation is very high. Vegetation has been removed to two inches or less in average stubble height. Almost all of the potential vegetative biomass has been used. Only the root system and part of the stem remains. That potential biomass that is now non-existent because of past elimination but grazing is considered vegetation that has been used.

APPENDIX III

2001 Capture Data

sa=subadult; m=male; f=female; mt=metamorph

date	hour	gender	mass	SV L	recapture?	PIT#	UTME	UTMN	comments
6-Jun-01	1248					<i>Coluber constrictor</i>	442427	4817548	
6-Jun-01	1259					<i>Pituophis catenifer</i>	442201	4817175	
6-Jun-01						photo point	442164	4817129	at edge of rock outcrop, facing east
6-Jun-01	1310					start & water chemistry	442073	4816978	large boulder in creek, near private boundary
6-Jun-01	1350	m	21.0	62	no	4239200D12	442241	4817159	oxbow
6-Jun-01	1417	sa	9.5	47	no	42393C281F	442373	4817305	natural enclosure; sa's are probably females
6-Jun-01	1419	sa	11.6	52	no	422D3F633E	442373	4817305	natural enclosure; sa's are probably females
6-Jun-01	1422	sa	13.7	53	no	4238663773	442373	4817305	natural enclosure; sa's are probably females
6-Jun-01	1424	sa	10.1	49	no	42392F2C1A	442373	4817305	natural enclosure; sa's are probably females
6-Jun-01	1426	sa	12.6	52	no	422D47213E	442373	4817305	natural enclosure; sa's are probably females
6-Jun-01	1428	f	45.7	82	no	4238327125	442373	4817305	natural enclosure; sa's are probably females
6-Jun-01	1500	sa	14.0	53	no	42384B6336	442373	4817305	natural enclosure; sa's are probably females
6-Jun-01	1517	f	40.0	80	no	422D285922	442407	4817317	eddy
6-Jun-01	1536	f	16.6	58	no	42391D6023	442437	4817405	had swollen toe on right rear
6-Jun-01	1546	sa	9.7	49	no	41620A620B	442454	4817407	stream
6-Jun-01	1551	sa	13.1	51	no	423827112B	442457	4817427	stream
6-Jun-01	1601	sa	12.1	53	no	423831600B	442503	4817431	stream
6-Jun-01	1605	sa	10.7	50	no	4238737469	442502	4817435	stream
6-Jun-01	1852				no	<i>Sceloporus occidentalis</i>	442671	4817752	at campsite
7-Jun-01	1012	sa	10.0	49	no	4238262558	442487	4817555	oxbow; just north of the first pinched canyon
7-Jun-01	1028	sa	10.0	48	no	422D22746E	442681	4817607	sidebow
7-Jun-01	1035	f	25.4	66	no	42381F0D25	442681	4817600	oxbow
7-Jun-01	1036	m	19.5	60	no	4238596109	442681	4817600	oxbow
7-Jun-01	1037	sa	6.6	44	no	4238167710	442681	4817600	oxbow
7-Jun-01	1041	sa	9.0	47	no	41617D627D	442681	4817600	oxbow
7-Jun-01	1103	sa	14.7	56	no	42384B4216	442745	4817588	stream
7-Jun-01	1115	sa	13.7	53	no	42393F033E	442821	4817592	stream
7-Jun-01	1144	sa	11.3	49	no	4238517003	442843	4817601	sidebow
7-Jun-01	1145	sa	11.1	48	no	422D3B1E49	442843	4817601	sidebow
7-Jun-01	1159					uncaptured	442891	4817575	sidebow; PDOP 18
7-Jun-01	1210	sa	13.5	55	no	423832241B	442918	4817603	stream; PDOP 10
7-Jun-01	1347	sa	14.0	53	no	4239154360	443233	4817452	oxbow
7-Jun-01	1353	sa	10.1	49	no	42392B780B	443254	4817447	sidebow
7-Jun-01	1405					uncaptured	443259	4817439	sidebow
7-Jun-01	1410					breeding site; large tads	443259	4817439	sidebow; photo
7-Jun-01	1411	sa	15.0	54	no	416201747F	443270	4817429	sidebow
7-Jun-01	1435	sa				uncaptured	443486	4817432	sidebow
7-Jun-01	1439					<i>Pituophis catenifer</i>	443499	4817448	
7-Jun-01	1443	sa	9.0	47	no	4238436C2A	443516	4817474	stream
7-Jun-01	1531					breeding site?; tadpoles	443807	4817944	sidebow
7-Jun-01	1536	sa	9.6	50	no	423917671E	443806	4817960	sidebow
7-Jun-01	1546	sa	10.2	49	no	432B183D72	443805	4817970	sidebow
7-Jun-01	1550	sa	18.2	50	no	4238796209	443809	4817959	sidebow
7-Jun-01	1608	sa	9.1	46	no	42384A5F03	443903	4818064	stream
7-Jun-01	1612					endpoint	443909	4818069	large boulder in creek; photo
7-Jun-01	1520					<i>Coluber constrictor</i>	443909	4818119	75m north of endpoint
8-Jun-01	1045	m	22.0	63	R	4239200D12	442252	4817148	sidebow
8-Jun-01	1122	sa	10.0	48	R	42393C281F	442371	4817295	natural enclosure
8-Jun-01	1156	sa	10.5	50	no	422D340B26	442407	4817347	pool in stream
8-Jun-01	1205	sa	15.3	53	no	42386B5F00	442405	4817354	stream
8-Jun-01	1212	sa	17.0	58	R	42391D6023	442421	4817395	stream
8-Jun-01	1220	sa	17.5	58	no	42390D7E59	442429	4817411	stream
8-Jun-01	1237	sa	9.3	49	R	41620A620B	442447	4817424	stream
8-Jun-01	1300	sa	9.5	48	R	4238262558	442587	4817555	oxbow

8-Jun-01	1313	sa	9.4	47	R	422D22746E	442669	4817601	oxbow
8-Jun-01	1319	sa	9.0	47	R	41617D627D	442676	4817608	oxbow
8-Jun-01	1320	f	37.0	78	no	4238333D14	442676	4817608	oxbow
8-Jun-01	1322	sa	6.5	43	R	4238167710	442676	4817608	oxbow
8-Jun-01	1330	f	24.5	65	R	42381F0D25	442676	4817608	oxbow
8-Jun-01	1545	sa	12.3	53	R	42393F033E	442814	4817611	stream
8-Jun-01	1555	sa	11.6	52	no	4238291117	442842	4817610	sidebow
8-Jun-01	1605	sa	11.1	48	R	422D3B1E49	442881	4817602	sidebow
8-Jun-01	1614	sa	13.0	53	R	423832241B	442921	4817612	stream
9-Jun-01	925				~24"	<i>Crotalus viridis</i>	442793	4817850	on west-facing slope
9-Jun-01	950				~42"	<i>Crotalus viridis</i>	443011	4817493	along stream, drinking water
9-Jun-01	955	sa				uncaptured	443099	4817475	sidebow
9-Jun-01	956					R. lut tadpoles	443099	4817475	sidebow
9-Jun-01	1006	f	29.5	71	no	423925196E	443175	4817473	stream; scour pool
9-Jun-01	1015	sa	10.3	49	no	423922023E	443258	4817453	stream
9-Jun-01	1018	sa	13.6	52	no	42384A5A3A	443240	4817457	sidebow
9-Jun-01	1026	sa	10.8	48	no	42383E6217	443250	4817447	sidebow
9-Jun-01	1032	sa	10.1	49	R	42392B780B	443256	4817455	stream
9-Jun-01	1041	sa	11.1	50	no	4238330E7E	443262	4817451	stream
9-Jun-01	1045	sa	12.6	52	no	42387B2D5C	443265	4817443	sidebow
9-Jun-01	1100	sa	11.0	53	no	4238426A10	443300	4817425	stream; scour pool
9-Jun-01	1115	sa	10.0	49	no	432D723A12	443528	4817493	in stream at fence
9-Jun-01	1140			68		R. lut tadpoles	443804	4817858	stream; scour pool
9-Jun-01	1145	f				uncaptured	443800	4817855	sidebow
9-Jun-01	1151	f	36.0	77	no	4328535D4D	443803	4817873	sidebow
9-Jun-01	1152	f	26.0	68	no	432D334857	443803	4817873	sidebow
9-Jun-01	1214	sa	10.2	48	no	42391A493A	443810	4817948	sidebow
4-Aug-01	1135	sa				uncaptured	442198	4817052	sidebow
4-Aug-01	1200	f				uncaptured	442371	4817309	natural enclosure
4-Aug-01	1217	f	23.6	65	R	41620A620B	442407	4817306	in rainpool in rock next to sidebow, covered in duckweed
4-Aug-01	1255	mt	4.5	36	no; toeclip #1	too little	442582	4817555	oxbow
4-Aug-01	1307	mt				uncaptured	442631	4817585	stream
4-Aug-01	1311	mt	4.0	31	no; toeclip #1	too little	442650	4817596	stream
4-Aug-01	1318	mt				uncaptured	442679	4817597	stream
4-Aug-01	1324	m	11.9	50	no	432C2C0452	442677	4817613	oxbow with big boulder below campsite
4-Aug-01	1330	mt	4.5	33	no; toeclip #1	too little	442699	4817617	stream
4-Aug-01	1334	mt				uncaptured	442699	4817617	stream
4-Aug-01	1342	mt	5.5	38	no; toeclip #1	too little	442757	4817589	stream
4-Aug-01	1347	mt				uncaptured	442843	4817605	sidebow
4-Aug-01	1348	mt	5.0	37	no; toeclip #1	too little	442843	4817605	sidebow
4-Aug-01	1353	mt	4.5	35	no; toeclip #1	too little	442878	4817595	oxbow
4-Aug-01	1354	mt				uncaptured	442878	4817595	oxbow
4-Aug-01	1355	mt				uncaptured	442878	4817595	oxbow
4-Aug-01	1356	mt				uncaptured	442878	4817595	oxbow
4-Aug-01	1357	mt				uncaptured			before third pinch along bank; pdop too high because of rock cliff.
4-Aug-01	1408	mt	4.2	35	no; toeclip #1	too little	442979	4817508	stream
4-Aug-01	1415	mt				uncaptured	443050	4817488	stream; scour pool
4-Aug-01	1416	mt				uncaptured	443048	4817471	stream; scour pool
4-Aug-01	1418	f				uncaptured	443054	4817485	floating on algal matt in scour pool; very skittish, did not resurface
4-Aug-01	1419	mt	3.0	29	no; toeclip #1	too little	443057	4817482	stream; scour pool
4-Aug-01	1420	mt				uncaptured	443048	4817471	stream; scour pool
4-Aug-01	1421	mt				uncaptured	443048	4817471	stream; scour pool
4-Aug-01	1422	mt				uncaptured	443091	4817484	stream
4-Aug-01	1432	mt	3.8	34	no; toeclip #1	too little	443131	4817464	stream
4-Aug-01	1438	mt	3.4	31	no; toeclip #1	too little	443172	4817470	stream
4-Aug-01	1439	mt	3.0	30	no; toeclip #1	too little	443172	4817470	stream
4-Aug-01	1445	mt	3.1	30	no; toeclip #1	too little	443173	4817463	stream
4-Aug-01	1447	mt				uncaptured	443182	4817465	stream
4-Aug-01	1455	mt				uncaptured	443194	4817464	stream
4-Aug-01	1456	f	23.8	65	no	4239154360	443191	4817458	stream
4-Aug-01	1457	mt				uncaptured	443202	4817464	stream
4-Aug-01	1507	mt	4.7	35	no; toeclip #1	too little	443362	4817400	stream
4-Aug-01	1510	m	22.0	63	no	4238206F38	443369	4817405	stream
4-Aug-01	1516	mt	3.1	33	no; toeclip #1	too little	443392	4817401	stream

4-Aug-01	1532	mt	4.1	35	no; toeclip #1	too little	443488	4817428	oxbow
4-Aug-01	1533	mt	3.3	28	no; toeclip #1	too little	443488	4817428	oxbow
4-Aug-01	1534	mt	2.7	29	no; toeclip #1	too little	443488	4817428	oxbow
4-Aug-01	1535	mt	3.1	30	no; toeclip #1	too little	443488	4817428	oxbow
4-Aug-01	1536	mt	3.1	32	no; toeclip #1	too little	443488	4817428	oxbow
4-Aug-01	1537	mt	2.5	30	no; toeclip #1	too little	443488	4817428	oxbow
4-Aug-01	1538	mt	2.1	28	no; toeclip #1	too little	443488	4817428	oxbow
4-Aug-01	1545					finished			clouds threatening
4-Aug-01	1712	mt				uncaptured	440998	4816958	scour pool