

Surveys for Giant Garter Snakes in Solano County: 2004 Report

By Glenn D. Wylie¹ and Lisa L. Martin

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U.S. Fish and Wildlife Service

¹Dixon Field Station
USGS Western Ecological Research Center
6924 Tremont Road
Dixon, CA 95620
707-678-0682 x 616
glenn_wylie@usgs.gov

U.S. DEPARTMENT OF THE INTERIOR
GALE A. NORTON, SECRETARY

U.S. GEOLOGICAL SURVEY
Charles G. Groat, Director

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For additional information, contact:

Center Director
Western Ecological Research Center
U.S. Geological Survey
7801 Folsom Blvd., Suite 101
Sacramento, CA 95826

BACKGROUND

Giant garter snakes (*Thamnophis gigas*) are endemic to wetlands of the Central Valley and are federally and state listed as threatened (U.S. Fish and Wildlife Service 1993) because of loss of over 95% of original wetlands in the Central Valley (Frayer et al. 1989) and fragmentation of remaining habitat. Little information exists on giant garter snakes in Solano County beyond historic observations conducted on a haphazard basis. Focused surveys are needed to assess the distribution and abundance of giant garter snakes in Solano County to provide scientific information for habitat conservation planning for Solano County. This report summarizes the results of the USGS surveys for giant garter snakes in Solano County for the 2004 field season.

OBJECTIVES

The objectives of this project are 1) to determine the presence or the (presumptive) absence of giant garter snakes in selected irrigation canals and natural drainage features in eastern Solano County, 2) estimate the abundance of giant garter snakes in areas where snakes are present, and 3) assess the quality of habitat types for supporting giant garter snakes in the study areas.

PROCEDURES

We sampled 15 locations along irrigation canals and other water features in the eastern part of Solano County we determined most likely to support populations of giant garter snakes (Figure 1, Table 1). Modified floating minnow traps (Casazza et al. 2000) were deployed along the edge of the water at each location approximately 10 meters apart. Traps were checked daily for giant garter snakes and their prey species. Habitat was characterized within one meter of each trap and vegetative characteristics were averaged over each trapping location. Adjacent field conditions were also recorded at the time of trapping.

RESULTS

Lower Ulatis

We trapped three sections of lower Ulatis Creek from late June to early August (Figure 1, Table 1). We captured no giant garter snakes at any of these sites, but we did catch two common garter snakes each at Lower Ulatis 1 and Lower Ulatis 2 (Table 1). We did catch some small fish in the traps as giant garter snake food items, but we caught almost no tadpoles (Table 2). At Lower Ulatis and Lower Ulatis 1 the vegetation near the traps was dominated by marsh primrose and cattails. Habitat substrate was

mostly open water and emergent vegetation (Figures 2 and 3). At Lower Ulatis 2 the vegetation near the traps was mostly grasses and terrestrial weeds with water and terrestrial vegetation dominating the substrate type (Figure 4). Surrounding land use at each Ulatis site was mostly dry and irrigated pasture.

McCune

We trapped two sections of McCune Creek during June and early July (Figure 1, Table 1). We captured no giant garter snakes at either location, but we did catch two common garter snakes and a king snake (Table 1). We caught a few fish and one tadpole at the McCune sites (Table 2). The vegetation near the traps at both locations was dominated by terrestrial grasses and weeds with open water and terrestrial vegetation dominating as the substrate type (Figures 5 and 6). Surrounding land use was irrigated non-rice crops.

Salem Road

We trapped a canal near Salem Road during July (Figure 1, Table 1). We captured no giant garter snakes or any other snake at this location (Table 1). We caught several fish, but no tadpoles in the traps at this site (Table 2). The vegetation near the traps was mostly grasses and sedges, with a mix of water, emergent and terrestrial vegetation as the substrate type (Figure 7). Surrounding land use was dry pasture.

Sweeny Creek

We trapped two sections of Sweeny Creek from early to mid-June (Figure 1, Table 1). We captured no giant garter snakes or any other snake at these locations (Table 1). We only caught a few fish at each location (Table 2). The vegetation near the traps was mostly terrestrial grasses and weeds with water and terrestrial vegetation dominating the substrate type (Figures 8 and 9). Surrounding land use was non-rice crops and upland fields.

V Drain

We trapped four locations in the V Drain from mid-June to mid-August (Figure 1, Table 1). We captured no giant garter snakes or any other snake at these sites (Table 1). We captured several fish in the V Drain, but no tadpoles at these sites (Table 2). The vegetation near the traps was mostly terrestrial grasses and weeds with water and terrestrial vegetation dominating the substrate type (Figures 10-13). Surrounding land use was upland and irrigated non-rice crops.

W Drain

We trapped three locations of the W Drain from mid-July to mid-August (Figure 1, Table 1). We captured no giant garter snakes, but we did capture two common garter snakes and one gopher snake at these sites (Table 1). We caught the most fish of any

other location at the W Drain sites (Table 2). At the north site cattails and terrestrial weeds dominated the vegetation near the traps while riprap and water dominated the substrate type (Figure 14). At the other two locations terrestrial grasses and weeds dominated the vegetation with water and terrestrial vegetation dominating the substrate type (Figures 15 and 16).

DISCUSSION

We caught no giant garter snakes at any of the 15 locations we trapped in Solano County during summer 2004. We caught only a few common garter snakes at these sites. Although vegetative and substrate characteristics are similar to other sites in which we find giant garter snakes, prey species for snakes only appear to be abundant in the W Drain. Surrounding land use also maintained little water on the landscape.

The most promising areas to find giant garter snakes now appear to be along the edge of Solano County near the Yolo Bypass and in the tidally influenced areas of the southern part of the county. We will concentrate our surveys in these areas in 2005. We will also survey for snakes earlier in the spring during 2005 to encompass the time of peak activity, and, therefore, trapability of giant snakes. We feel these alterations in our survey will give us the best chance to discover giant garter snakes in Solano County if there are any of this species in the county.

LITERATURE CITED

- Casazza, M. L., G. D. Wylie, and C. J. Gregory. 2000. A funnel trap modification for surface collection of aquatic amphibians and reptiles. *Herpetological Review* 31(2), 91-92.
- Fruyer, W.E., D.D. Peters, and H.R. Pywell. 1989. Wetlands of the California Central Valley status and trends. U.S. Fish and Wildlife Service. Portland, Oregon. 28 pp.
- U.S. Fish and Wildlife Service. 1993. Endangered and threatened wildlife and plants: determination of threatened status for the giant garter snake. *Federal Register* 58:54053-54066.

Table 1. Trap numbers, search dates and other information for locations trapped for giant garter snakes in Solano County in 2004.

Study Site	Snake species caught or sighted	Adjacent Field conditions	Trap/Search Dates
Lower Ulatis	None	Dry grasses and crop/non-rice	50 traps 6/23-7/9
Lower Ulatis-1	2- <i>T. sirtalis</i> (common garter snake)	Dry and flooded grasses	50 traps 7/21-8/3
Lower Ulatis-2	2- <i>T. sirtalis</i> (common garter snake)	Dry and flooded grasses	50 traps 7/22-8/4
McCune Creek-N	1- <i>T. sirtalis</i> (common garter snake)	Irrigated crop/non-rice	50 traps 6/17-7/1
McCune Creek-S	1- <i>T. sirtalis</i> (common garter snake) 1- <i>L. g. californiae</i> (king snake)	Irrigated crop/non-rice	50 traps 6/18-7/2
Salem Rd.	None	Dry upland field	50 traps 7/15-7/29
Sweeney Creek-N	None	Dry crop/non-rice, disked field and upland field	50 traps 6/3-6/17
Sweeney Creek-S	None	Dry crop/non-rice and upland field	50 traps 6/4-6/18
Lower V Drain	None	Puddled crop/non-rice and dry upland field.	50 traps 7/1-7/15
Upper V Drain	None	Dry upland field and disked field.	50 traps 7/27-8/10
V Drain	None	Irrigated crop/non-rice	50 traps 6/22-7/8
V Drain-2	None	Irrigated crop/non-rice and upland field	50 traps 7/30-8/13
W Drain-N	None	Dry and irrigated upland field	50 traps 7/14-7/28
W Drain-S	2- <i>T. sirtalis</i> (common garter snake)	Dry, irrigated and flooded upland fields	100 traps 7/29-8/13

W Drain	<i>1- P. melanoleucus</i> (gopher snake)	Dry upland field	50 traps 7/2-7/16
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Table 2. Trap contents for giant garter snake prey species.

Trap contents	Lower Ulatis	Lower Ulatis-1	Lower Ulatis-2	McCune Creek-N	McCune Creek-S	Salem Rd.	Sweeny Creek-N	Sweeny Creek-S
Number of Frogs caught	2	0	0	0	0	0	0	0
Frog Density (frogs/trap days)	.003	*	*	*	*	*	*	*
Number of Tadpoles caught	0	1	0	0	1	0	0	0
Tadpole Density (tadpoles/trap days)	*	.002	*	*	.001	*	*	*
Number of Fish caught	15	10	1	8	0	14	2	2
Fish Density (fish/trap days)	.020	.015	.002	.011	*	.021	.003	.003
Total Prey Density (total prey/trap days)	.022	.017	.002	.011	.001	.021	.003	.003
Total number of GGS caught	0	0	0	0	0	0	0	0

Table 2 (continued).

Trap contents	Lower V Drain	Upper V Drain	V Drain	V Drain-2	W Drain-N	W Drain-S	W Drain
Number of Frogs caught	0	0	0	0	0	14	3
Frog Density (frogs/trap days)	*	*	*	*	*	.010	.004
Number of Tadpoles caught	0	0	0	0	0	0	0
Tadpole Density (tadpoles/trap days)	*	*	*	*	*	*	*
Number of Fish caught	7	8	10	1	26	26	31
Fish Density (fish/trap days)	.010	.011	.013	.001	.037	.019	.044
Total Prey Density (total prey/trap days)	.010	.011	.013	.001	.037	.030	.050
Total number of GGS caught	0	0	0	0	0	0	0

Figure 1. Trap locations for giant garter snake surveys in Solano County in 2004.

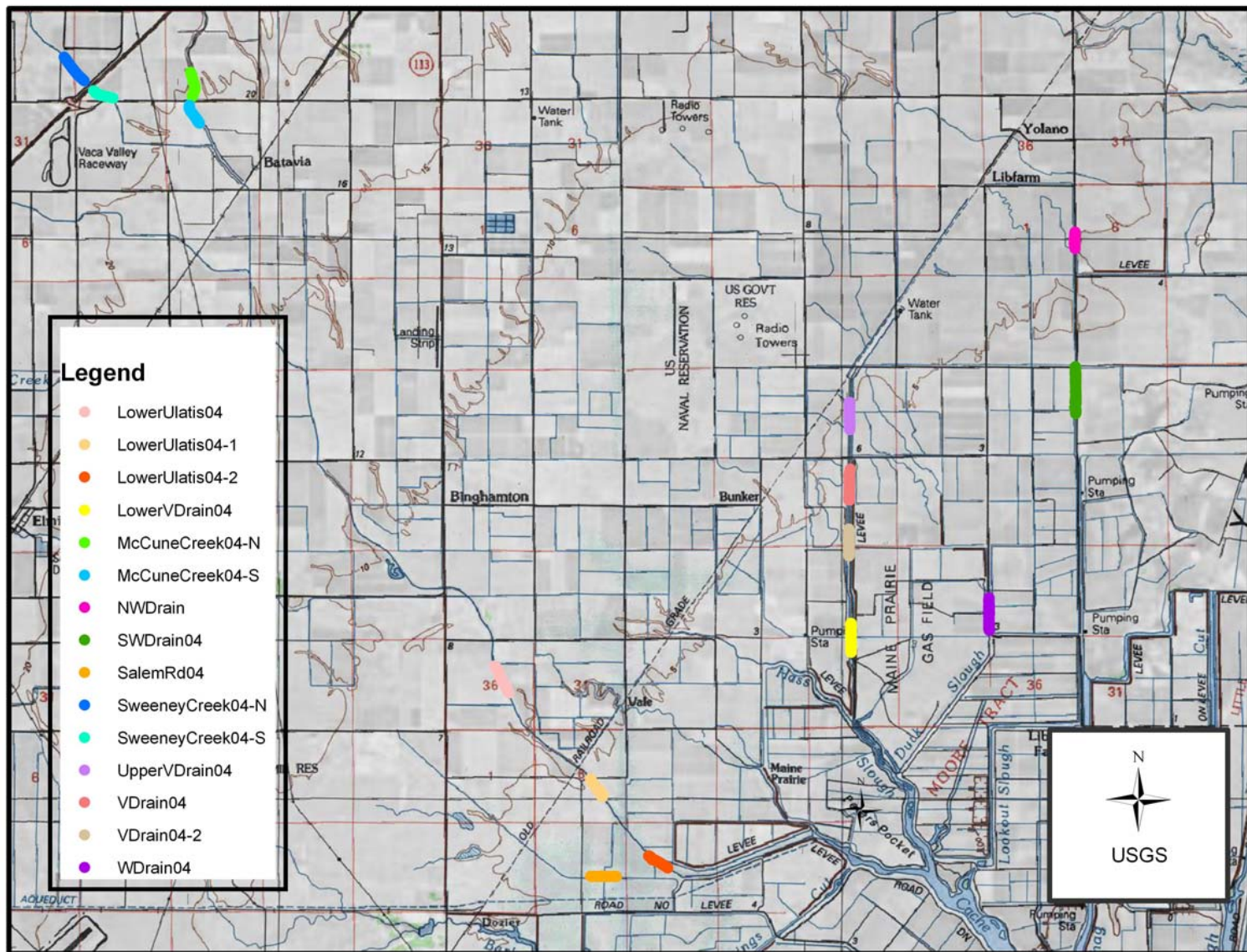


Figure 2. Vegetative and substrate characteristics near traps in the Lower Ulatis site.

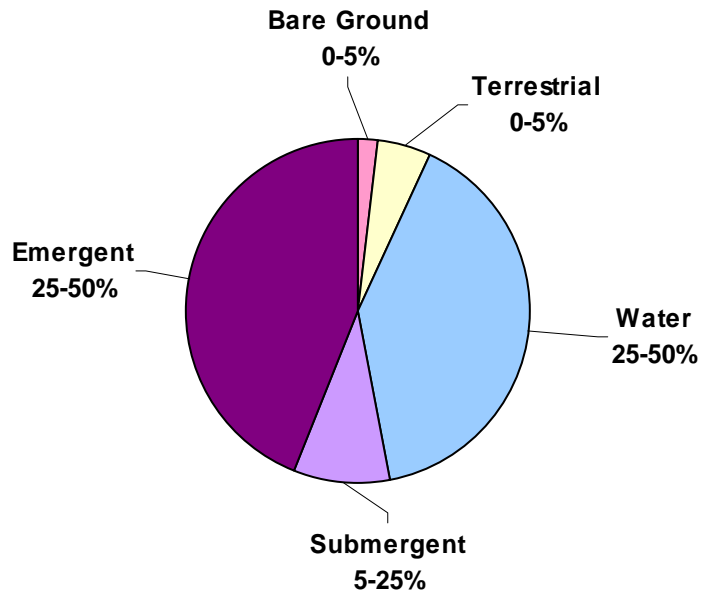
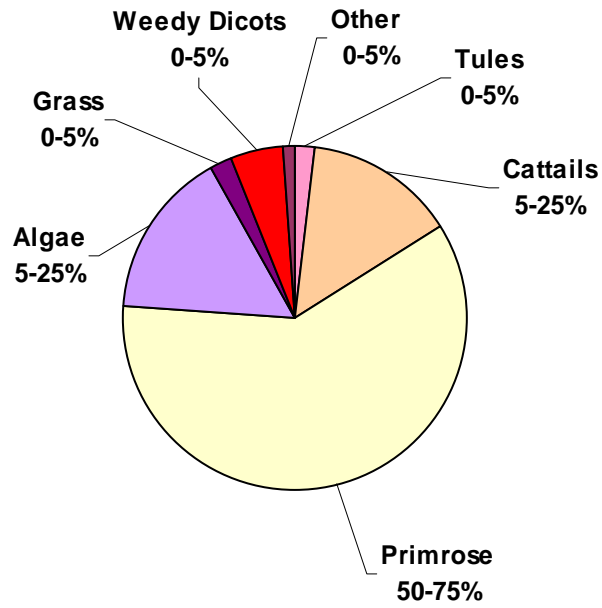


Figure 3. Vegetative and substrate characteristics near traps in the Lower Ulatis-1 site.

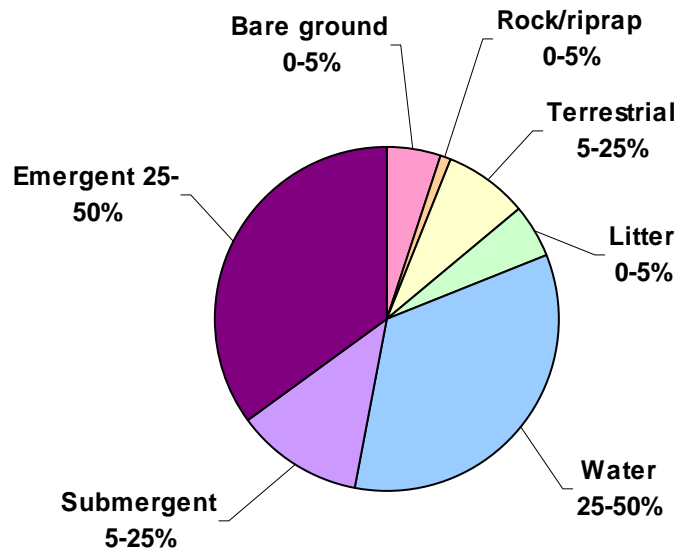
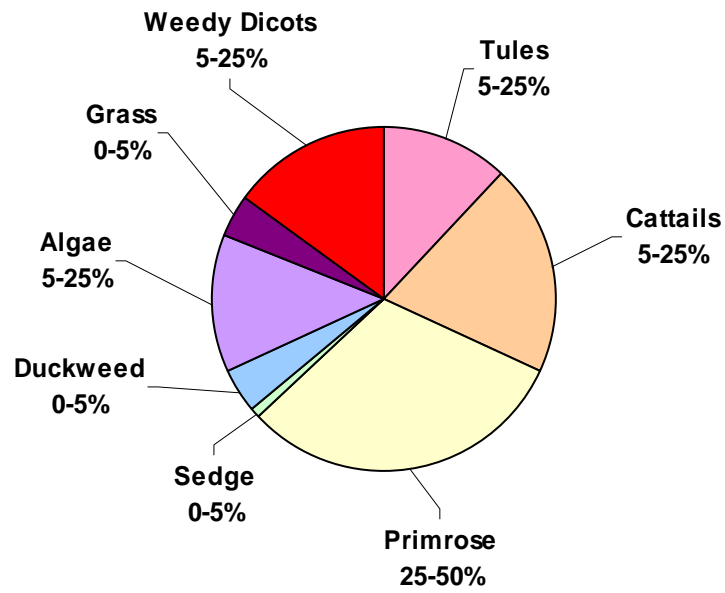


Figure 4. Vegetative and substrate characteristics near traps in the Lower Ulatis-2 site.

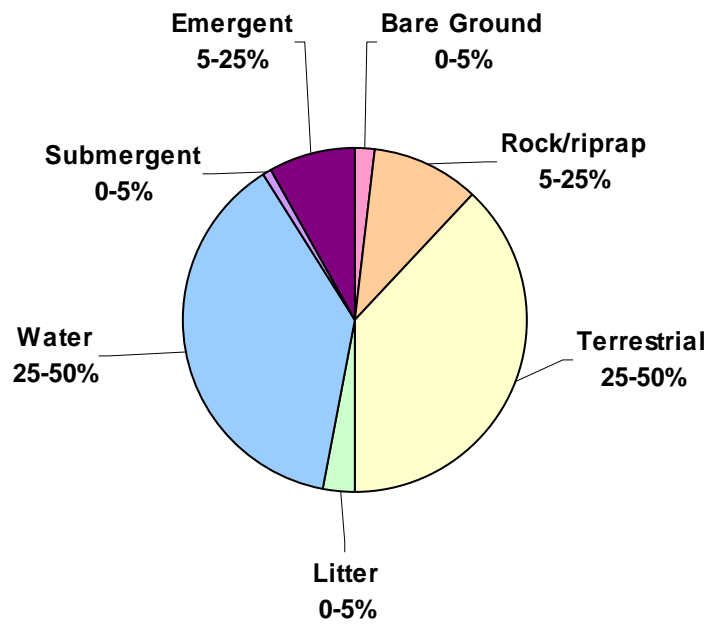
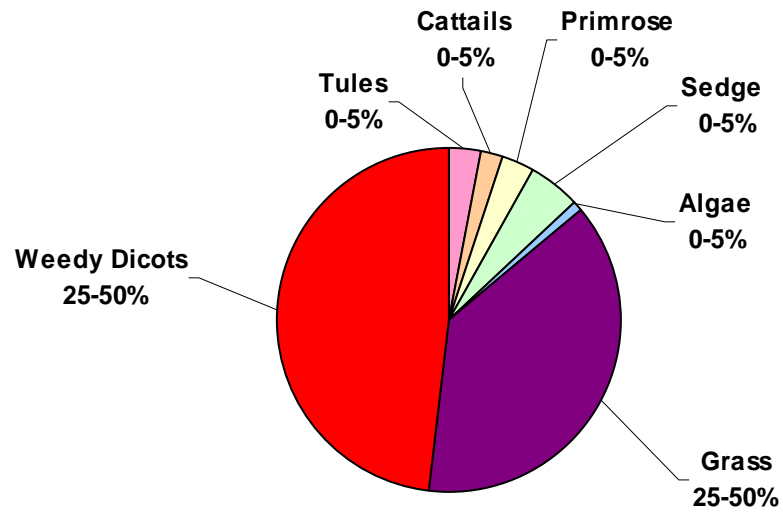


Figure 5. Vegetative and substrate characteristics near traps in the McCune North site.

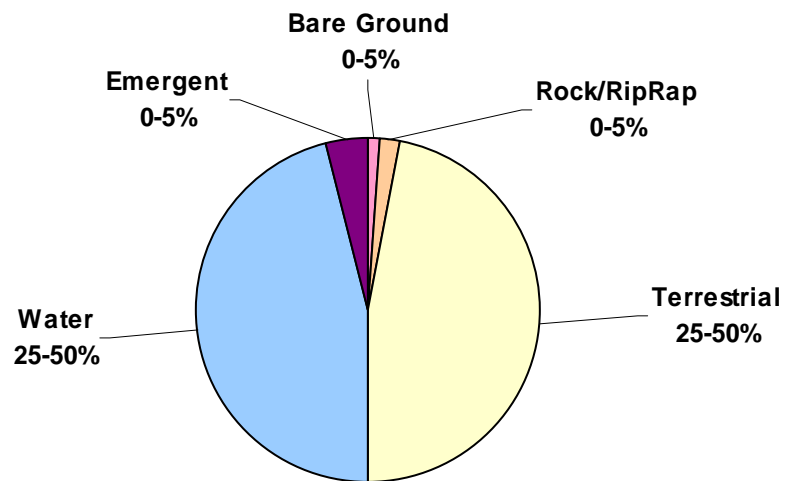
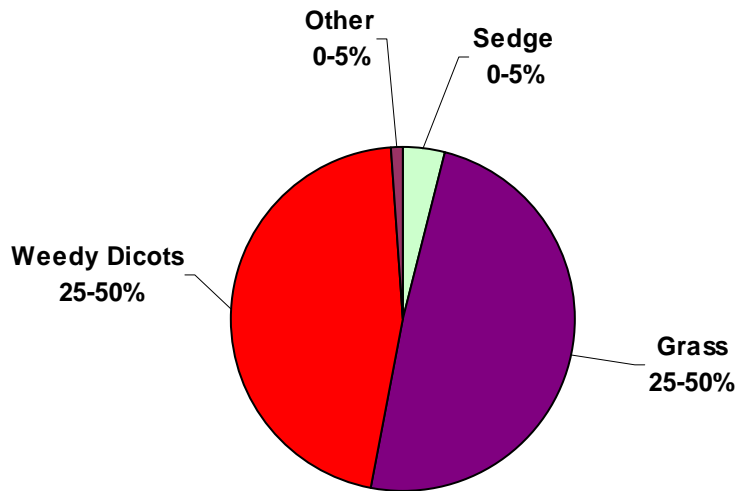


Figure 6. Vegetative and substrate characteristics near traps in the McCune South site.

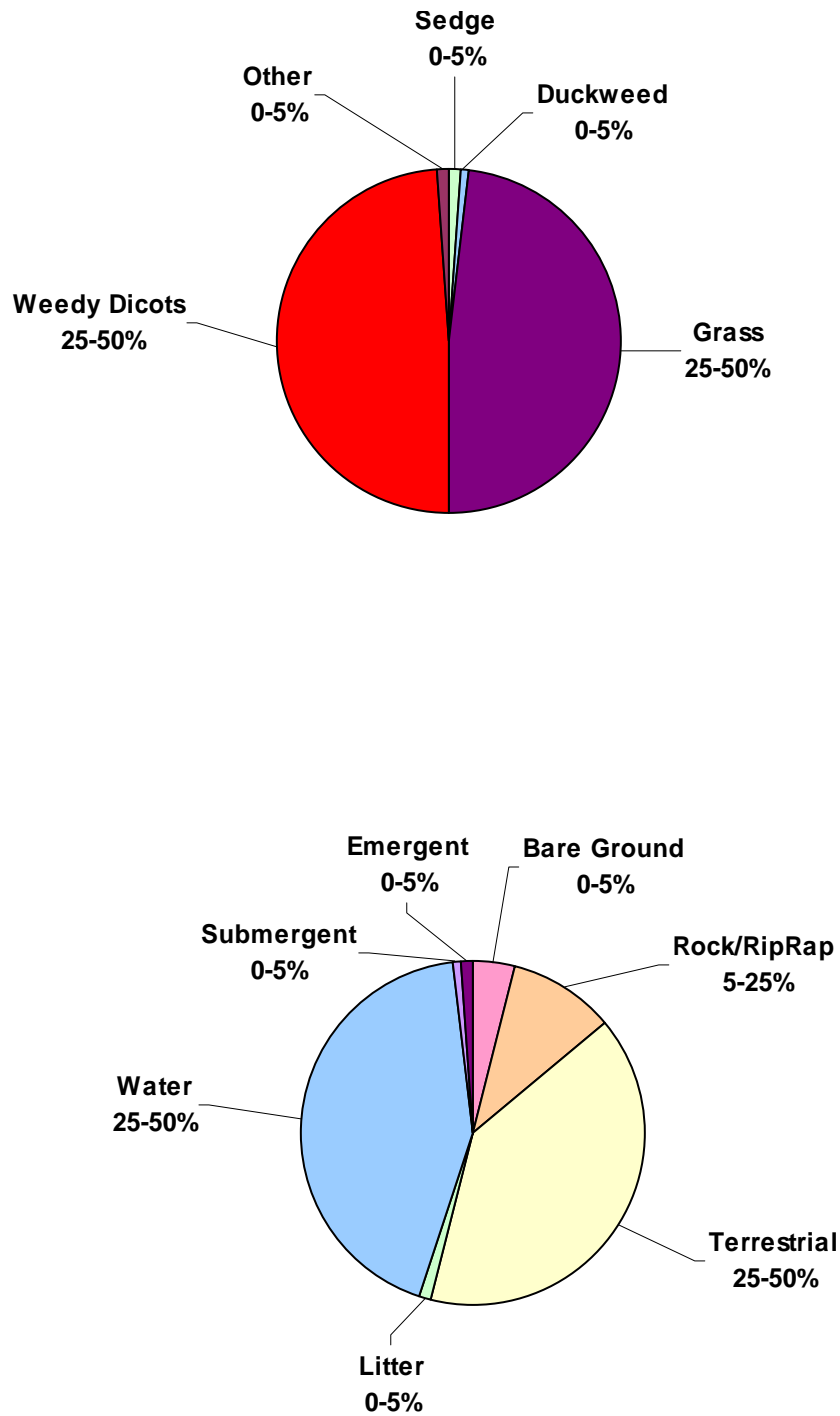


Figure 7. Vegetative and substrate characteristics near traps in the Salem Road site.

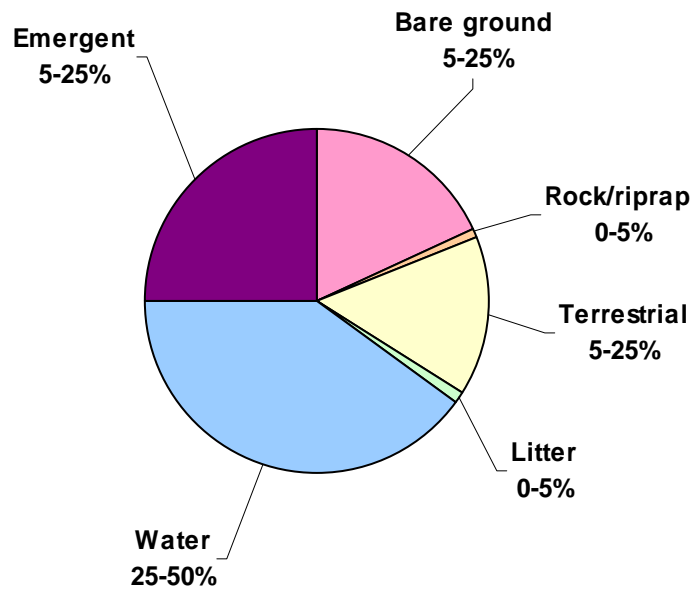
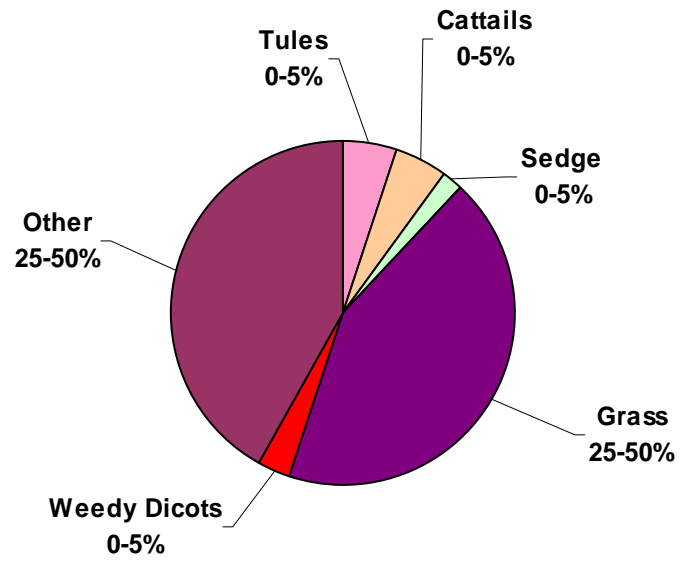


Figure 8. Vegetative and substrate characteristics near traps in the Sweeny Creek North site.

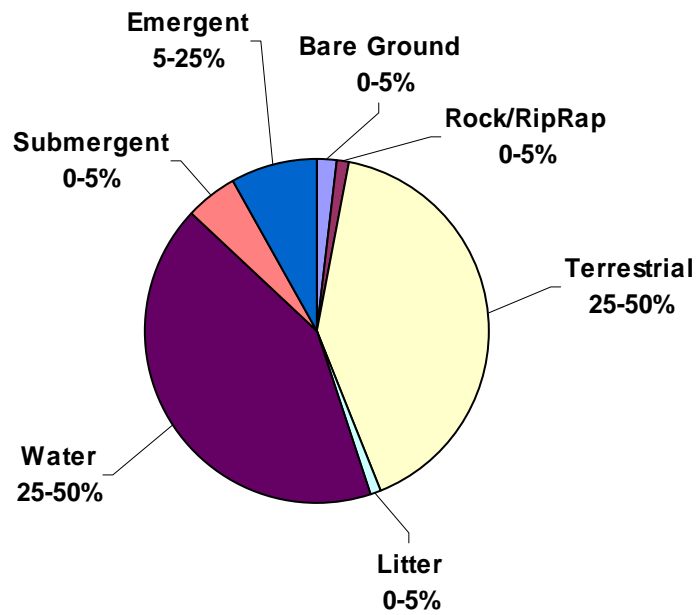
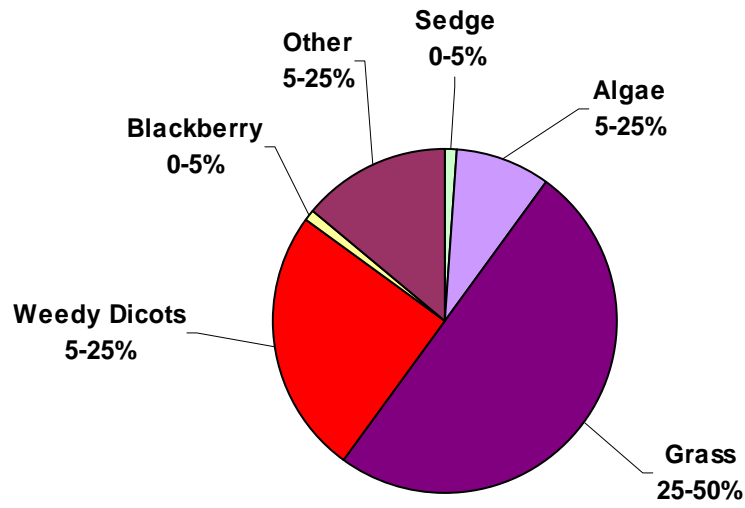


Figure 9. Vegetative and substrate characteristics near traps in the Sweeny Creek South site.

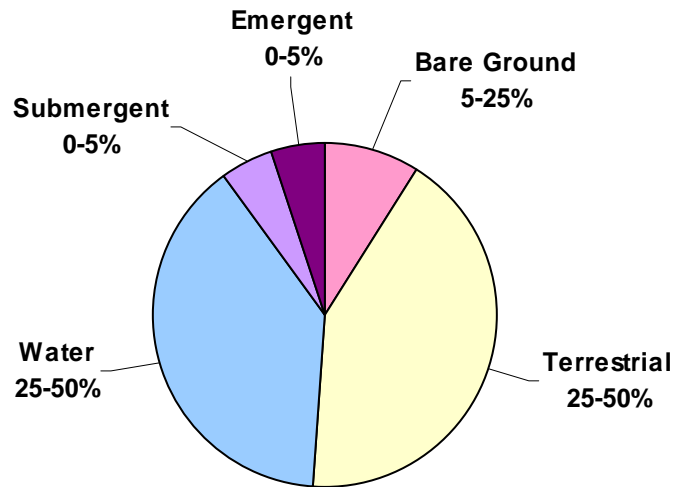
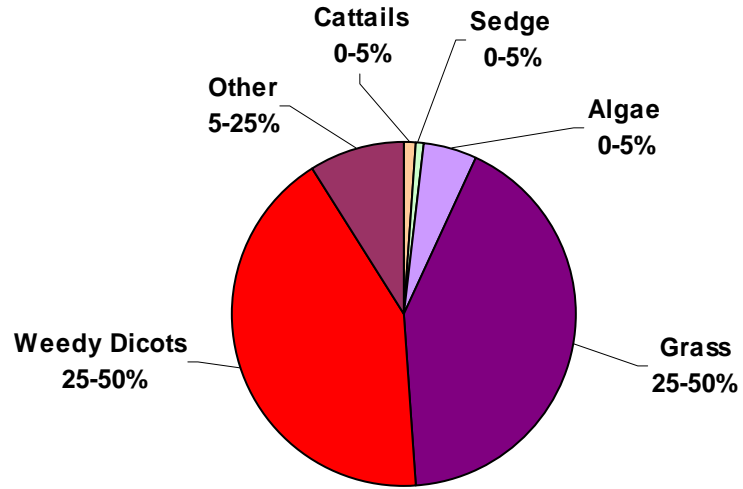


Figure 10. Vegetative and substrate characteristics near traps in the Lower V Drain site.

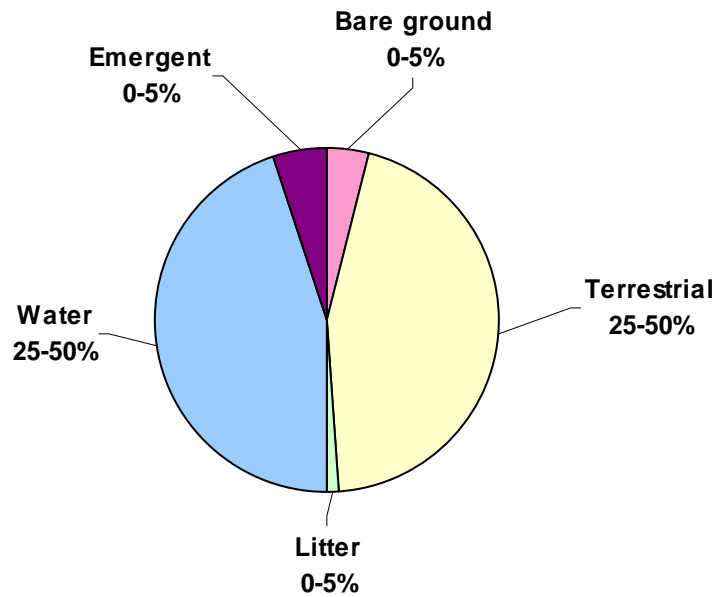
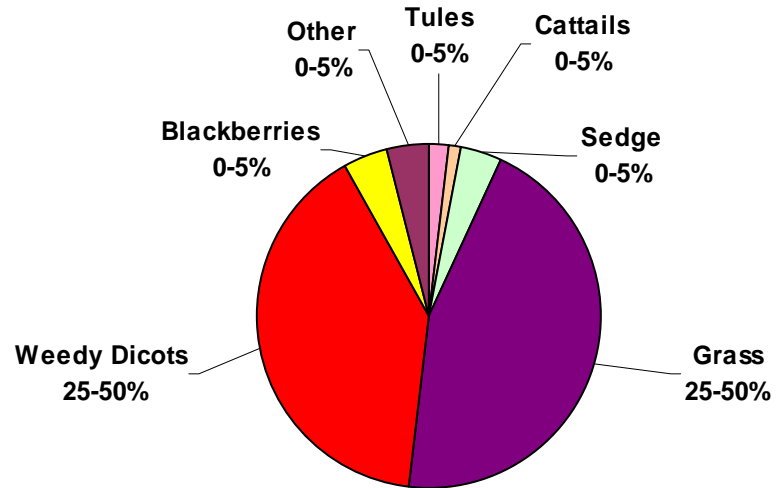


Figure 11. Vegetative and substrate characteristics near traps in the Upper V Drain site.

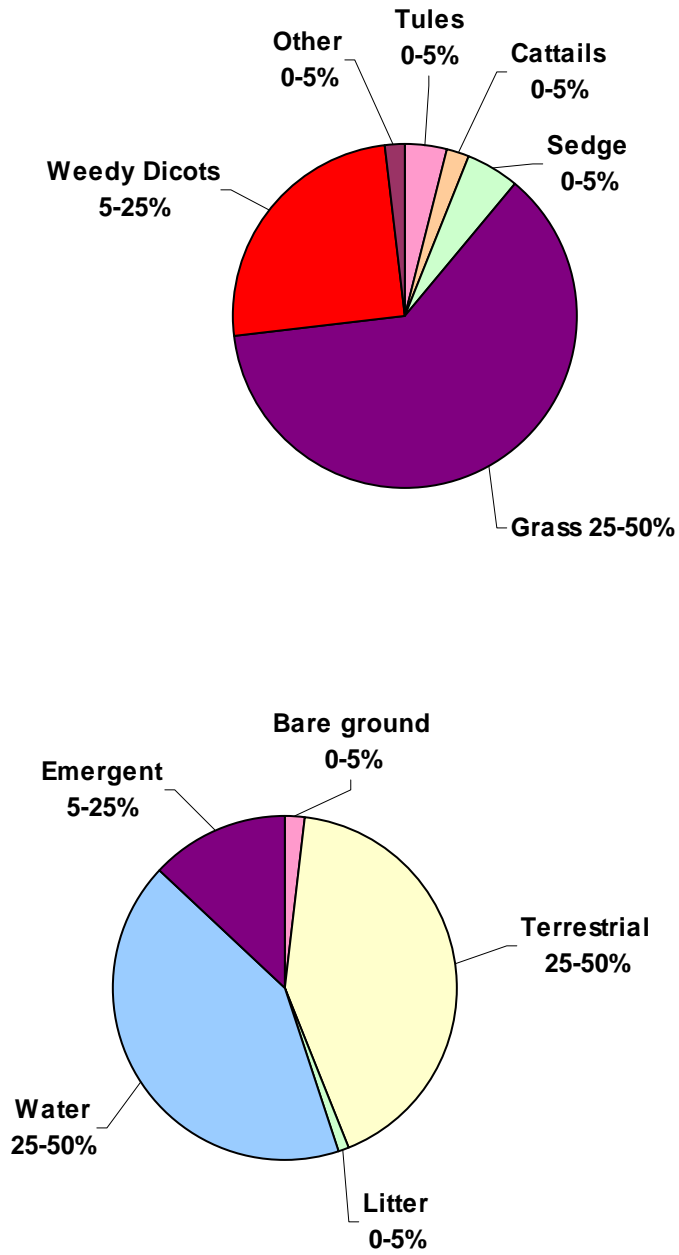


Figure 8. Vegetative and substrate characteristics near traps in the V Drain site.

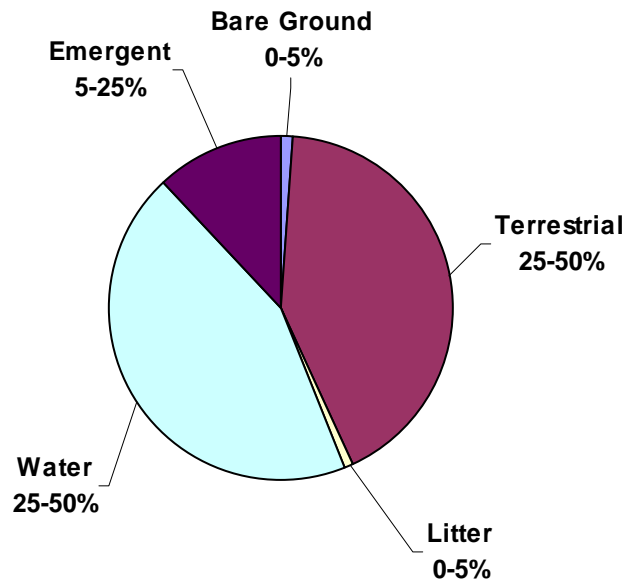
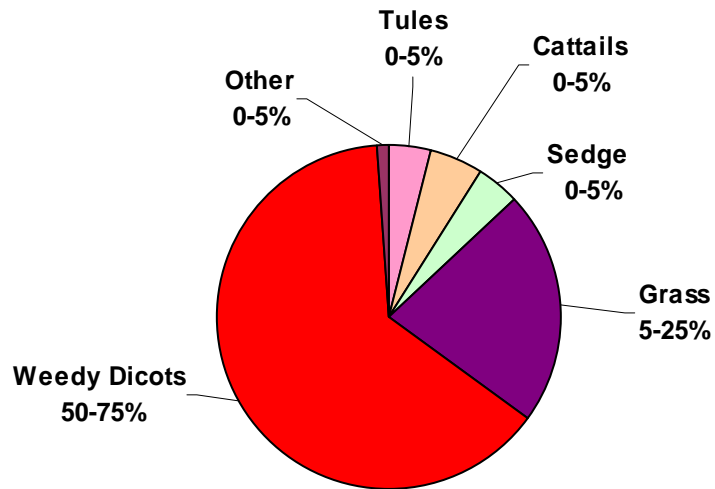


Figure 13. Vegetative and substrate characteristics near traps in the V Drain-2 site.

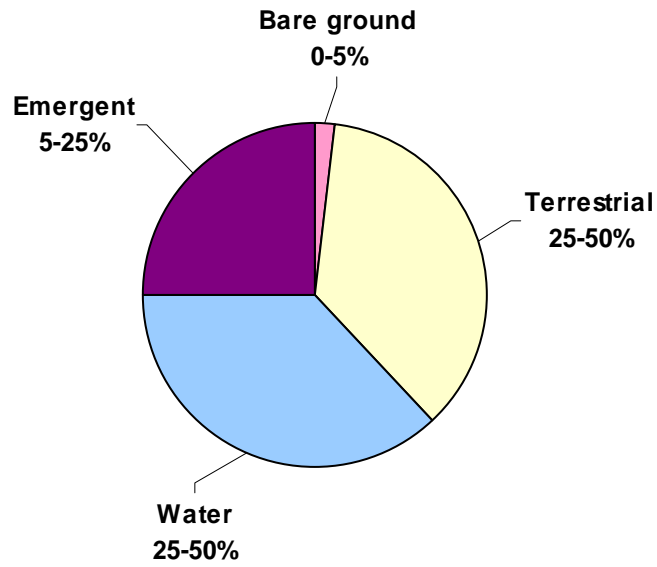
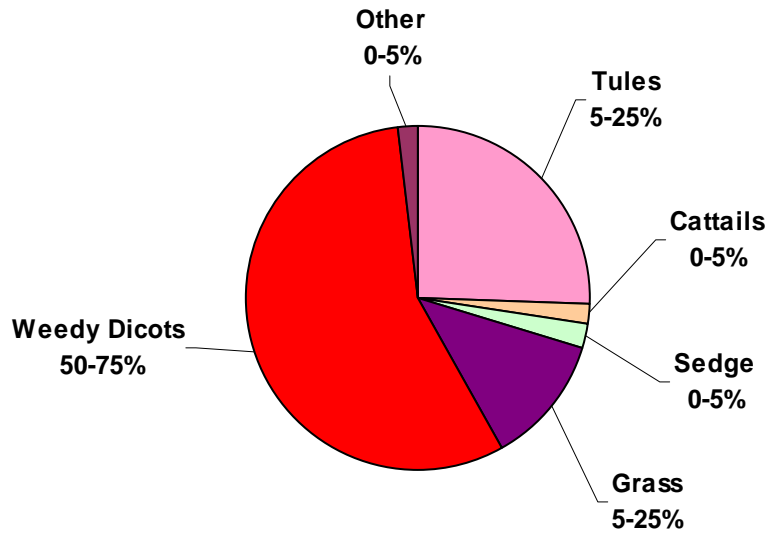


Figure 14. Vegetative and substrate characteristics near traps in the W Drain North site.

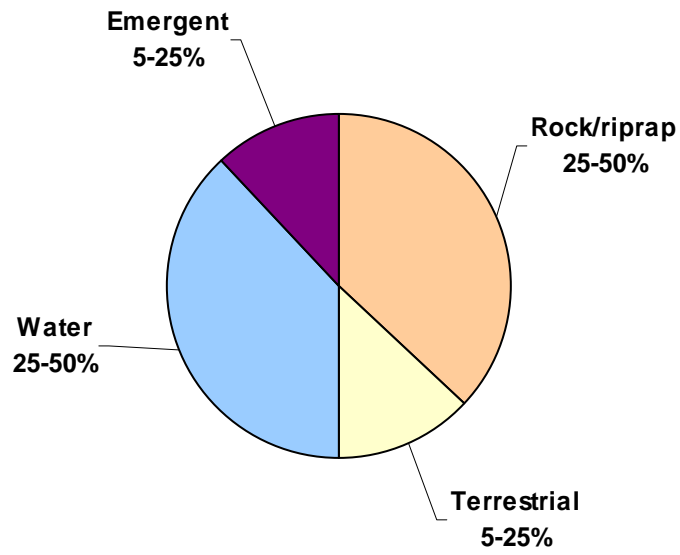
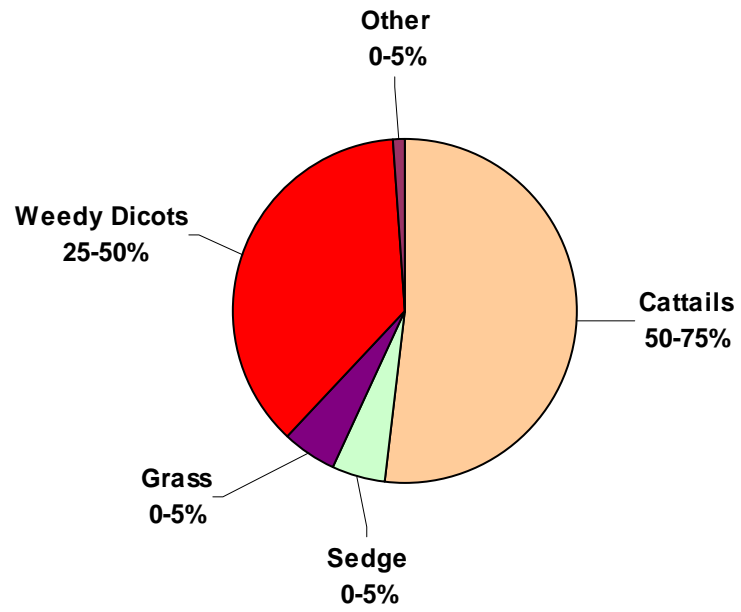


Figure 15. Vegetative and substrate characteristics near traps in the W Drain South site.

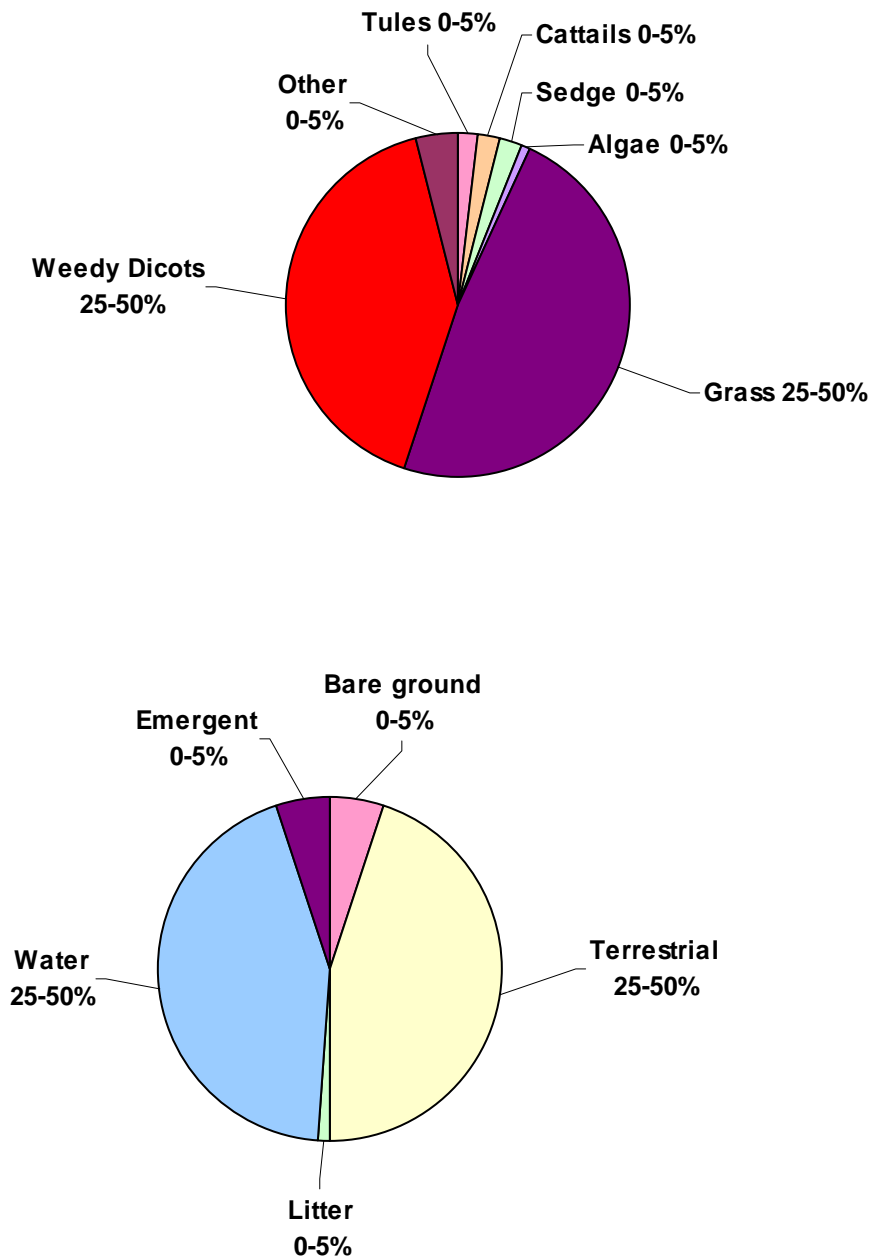


Figure 16. Vegetative and substrate characteristics near traps in the W Drain Site.

