

**Results of Surveys for Giant Gartersnakes (*Thamnophis gigas*) in the
Lindsey and Barker Slough Area of Solano County**

Data Summary for the Yolo County Resource Conservation District

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INTRODUCTION

Giant garter snakes (*Thamnophis gigas*) (GGS) 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. Because of their association with wetlands and waterways and their listed status, GGS are as species of interest for CALFED and were included in the grant proposal funded by CALFED with the Yolo County Resource Conservation District. One requirement of this proposal was a survey for GGS in Lindsey-Barker Slough/Calhoun Cut area of Solano County, hereinafter referred to as LBC. Little information existed before 2004 on GGS in Solano County beyond historic observations conducted on a haphazard basis. The USGS previously conducted systematic surveys for GGS in Solano County in 2004 and 2005, but did not include the Lindsey-Barker Slough/Calhoun Cut area in these surveys (Wylie and Martin 2004, 2005). This report summarizes the results of the USGS surveys for GGS in Solano County during 2008 and again in 2010. Sampling was interrupted by a funding freeze in 2009.

OBJECTIVES

The objectives of this project were 1) to determine the presence or the (presumptive) absence of GGS in the LBC, 2) estimate the abundance of GGS in areas where snakes are present, and 3) assess the quality of habitat types for supporting GGS in the study areas.

METHODS

We sampled selected areas of the LBC in September and early October of 2008 and in June-August of 2010 (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 GGS. Potential prey species, fish, frogs, and tadpoles, as well as crayfish and insects were counted in one out of five traps as a rough index of prey abundance in these habitats. The contents of these traps were recorded and then emptied daily.

We characterized habitat within one meter radius of the center of each trap. We determined the percent vegetative cover composed of tules (*Scirpus acutus*), cattails (*Typha latifolia*), marsh primrose (*Ludwigia* spp.), blackberry (*Rubus* spp.) and broad taxonomic categories such as duckweeds (*Lemna* and *Azolla* spp.), algal mats (algae), grasses, sedges, and dicotyledonous weedy plants such as thistle (e.g., *Cearaurea* spp., *Cirsina* spp., and *Salsola* spp.), smartweeds (*Polygonum* spp.), wild mustard (*Brassica* spp.) and wild radish (*Raphanus* spp.) which are hereinafter referred to as weedy dicots. We averaged these percentages over the traps in each trap line. We categorized substrate

as the percent of surface area within 1m of the center of each trap composed of open water, emergent vegetation, terrestrial vegetation, litter, bare soil, rock (rip/rap), etc.

RESULTS

We recorded 3,641 trap-days in our survey effort (Table 1). We captured no snakes of any kind in the LBC in either 2008 or 2010 despite the more intensive trapping effort in 2010 (Table 2). Vegetation adjacent to traps (Figure 2-10) was predominately tules, which is typical for many other areas in which we have caught GGS (e.g., Wylie et al. 2005, Wylie and Amarello 2006). Although potential GGS prey was present in some traps (Table 2), the densities were less than other sites in which we have captured GGS (e.g., Wylie et al. 2005, Wylie and Amarello 2006).

LITERATURE CITED

- Casazza, M.C., 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.
- Framer, 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.
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- Wylie, G.D., M.L. Casazza, L.L. Martin, and M. Carpenter. 2005. Identification of Key GGS Habitats and Use Areas on the Sacramento National Wildlife Refuge Complex. USGS final report. 18pp.
- Wylie, G.D., and M.A. Amarello. 2006. Results of 2006 monitoring for giant garter snakes (*Thamnophis gigas*) for the Bank Protection Project on the Left Bank of the Colusa Basin Drainage Canal in Reclamation District 108, Sacramento River Bank Protection Project, Phase II. USGS final report. 16pp.

Table 1. Lindsay Barker trap lines set in 2008 and 2010. Start and end dates, number of traps per trap line, and number of trap days per trap line are reported.

Year	Trap Line	Start Date	End Date	# Traps	# Trap Days
2008	Upper Lindsey Slough A	9/16/2008	10/6/2008	50	1000
2010	Lindsay Barker West	6/26/2010	7/10/2010	25	350
2010	Lindsay Barker Barn	6/27/2010	7/10/2010	20	260
2010	Drift Fence 1 & 2	6/27/2010	7/11/2010	4	56
2010	Lindsey Barker East	6/28/2010	7/11/2010	25	325
2010	Barn Pocket	8/8/2010	8/27/2010	25	475
2010	LB East Wetland	8/8/2010	9/1/2010	25	600
2010	East Inlet	8/9/2010	9/1/2010	25	575

Table 2. Contents of traps (every 5 traps recorded) for Lindsay Barker trap lines in 2008 and 2010.

Year	Trap Line	Snakes	Frogs	Tadpoles	Crayfish	Fish	Insects
	Upper Lindsey Slough						
2008	A	0	1	0	0	5	16
2010	Lindsey Barker West	0	0	0	35	0	0
2010	Lindsey Barker Barn	0	0	0	2	0	0
2010	Drift Fence 1 & 2	0	0	2	6	58	3
2010	Lindsey Barker East	0	0	0	8	1	0
2010	Barn Pocket	0	0	0	19	10	0
2010	East Wetland	0	0	20	13	17	8
2010	East Inlet	0	0	0	5	2	1

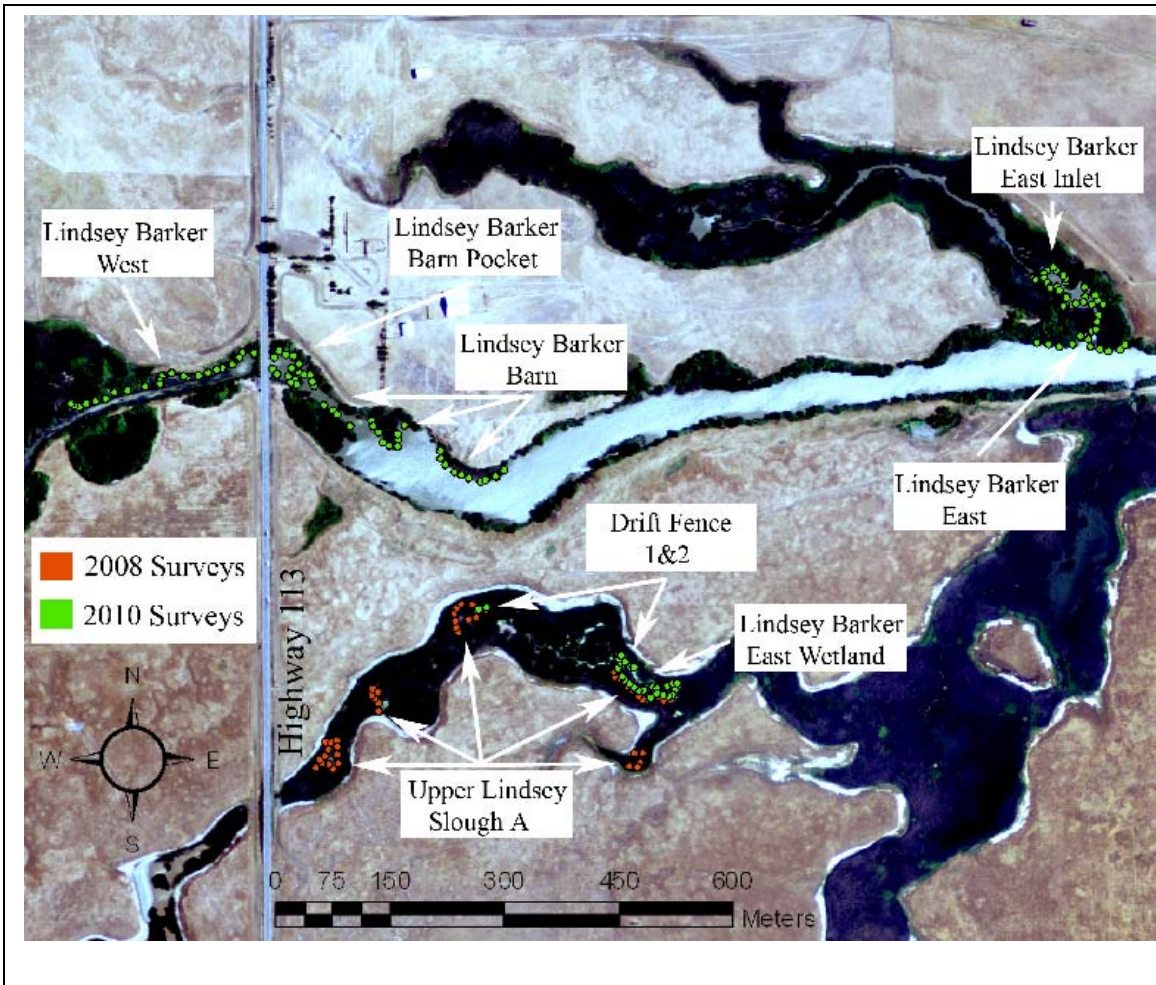


Figure 1. Sampling locations for the Lindsey and Barker Slough area in Solano County.

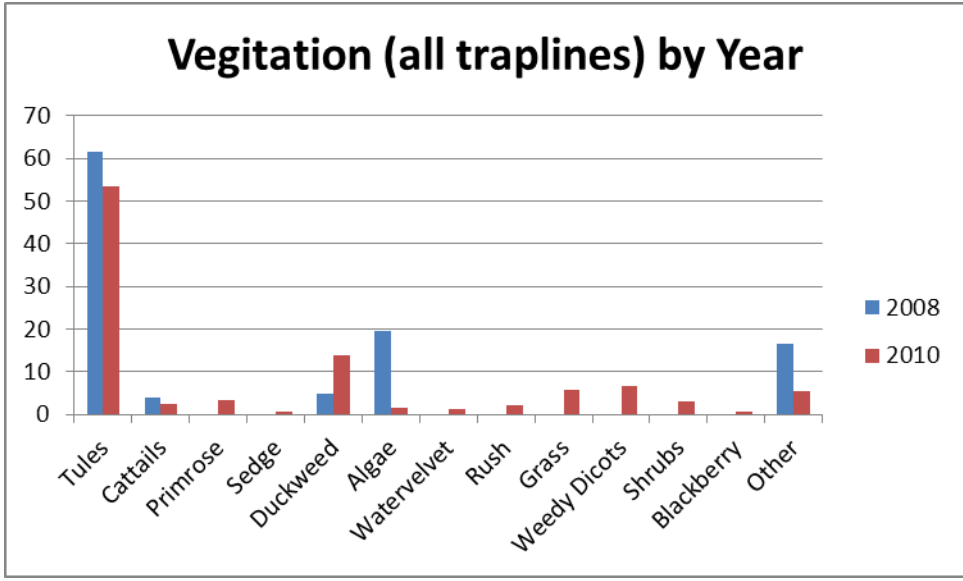


Figure 2. Average vegetative characteristics adjacent to all traplines.

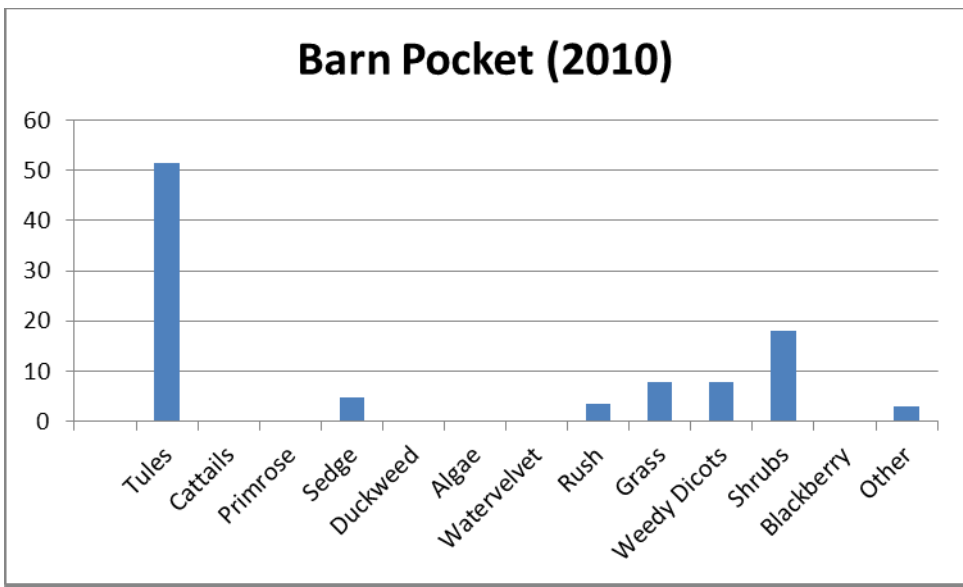


Figure 3. Vegetative characteristics adjacent to the Barn Pocket trapline.

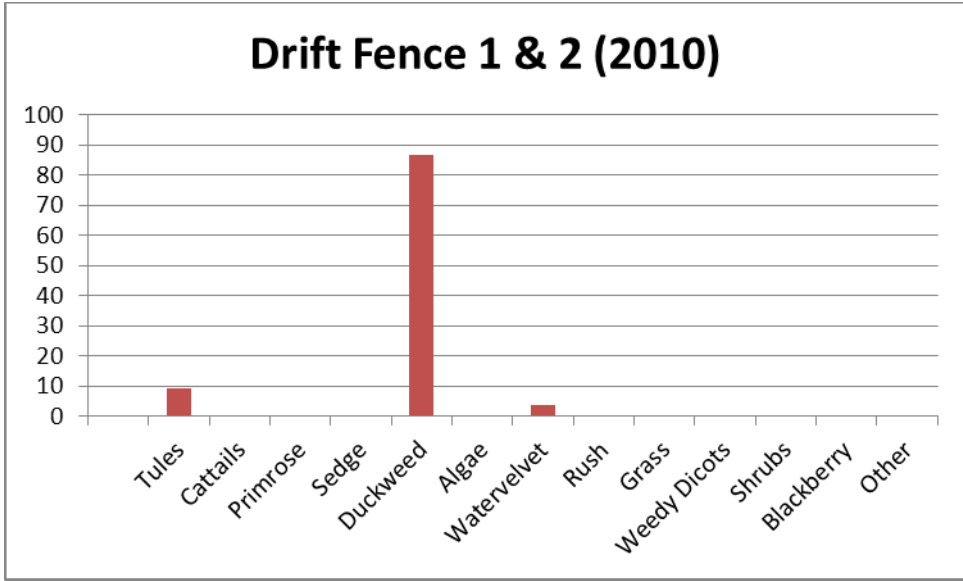


Figure 4. Vegetative characteristics adjacent to the Drift Fence 1&2 trapline.

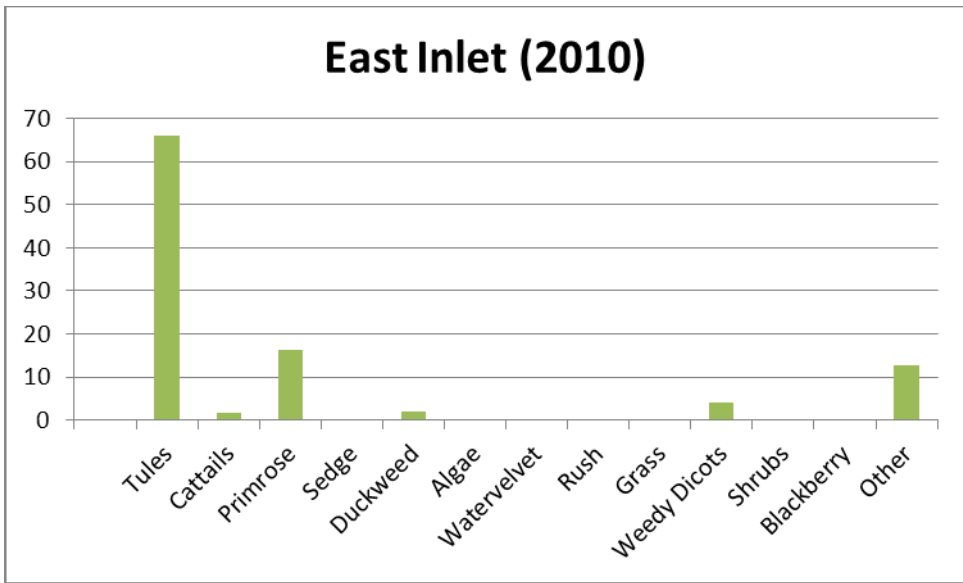


Figure 5. Vegetative characteristics adjacent to the East Inlet trapline.

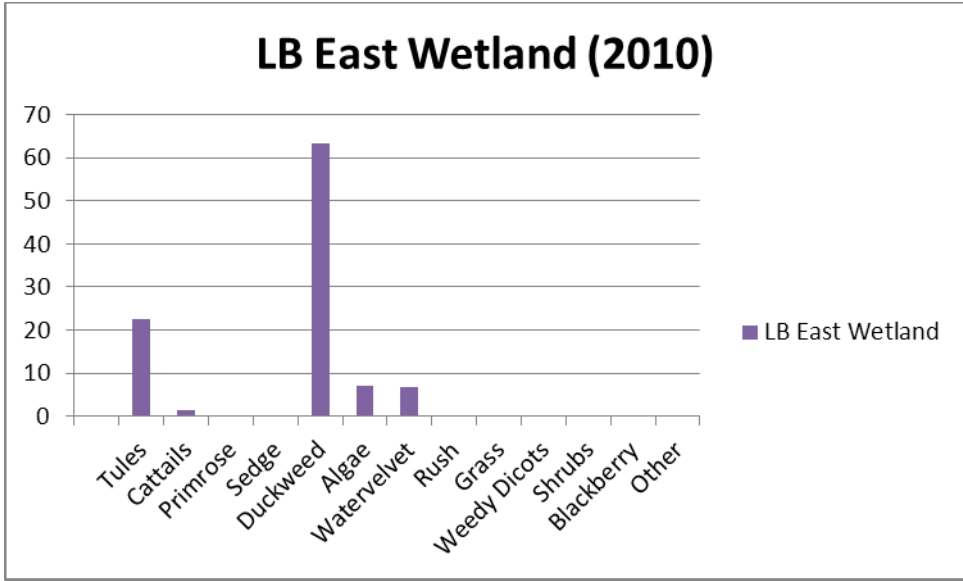


Figure 6. Vegetative characteristics adjacent to the LB East Wetland trapline.

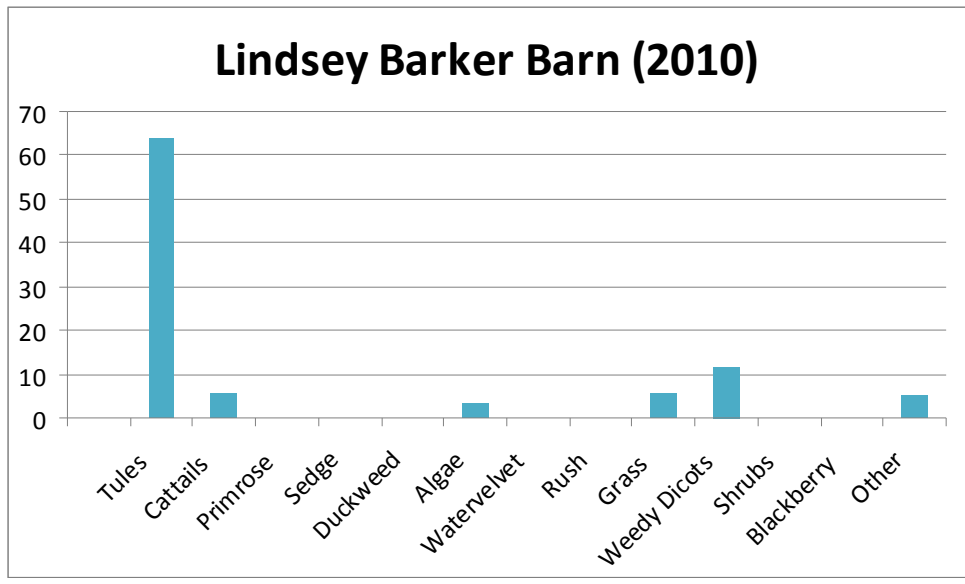


Figure 7. Vegetative characteristics adjacent to the Lindsey Barker Barn trapline.

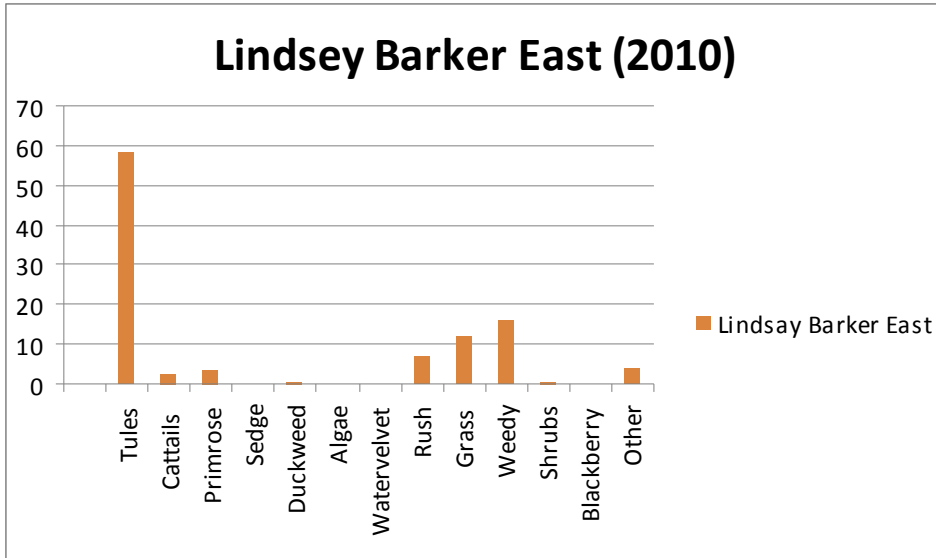


Figure 8. Vegetative characteristics adjacent to the Lindsay Barker East trapline.

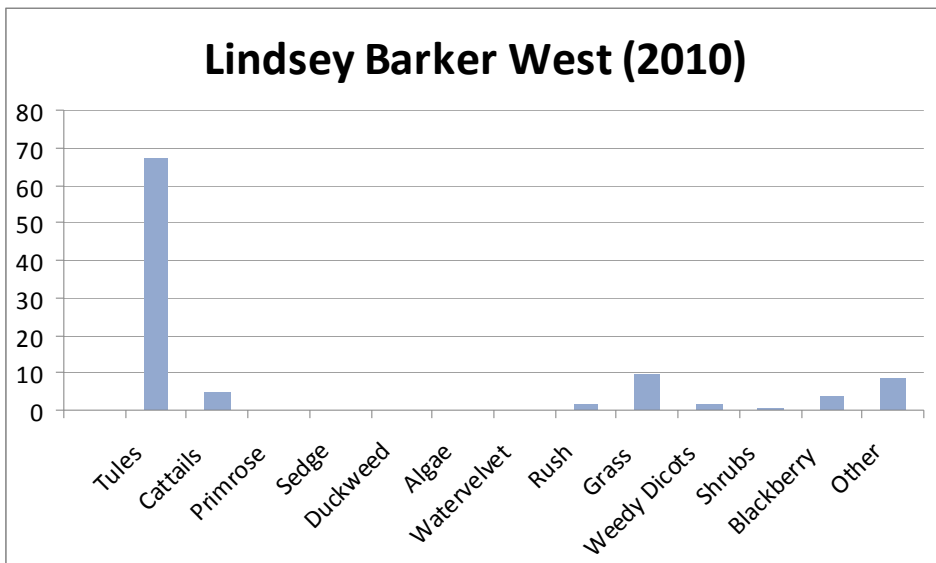


Figure 9. Vegetative characteristics adjacent to the Lindsay Barker West trapline.

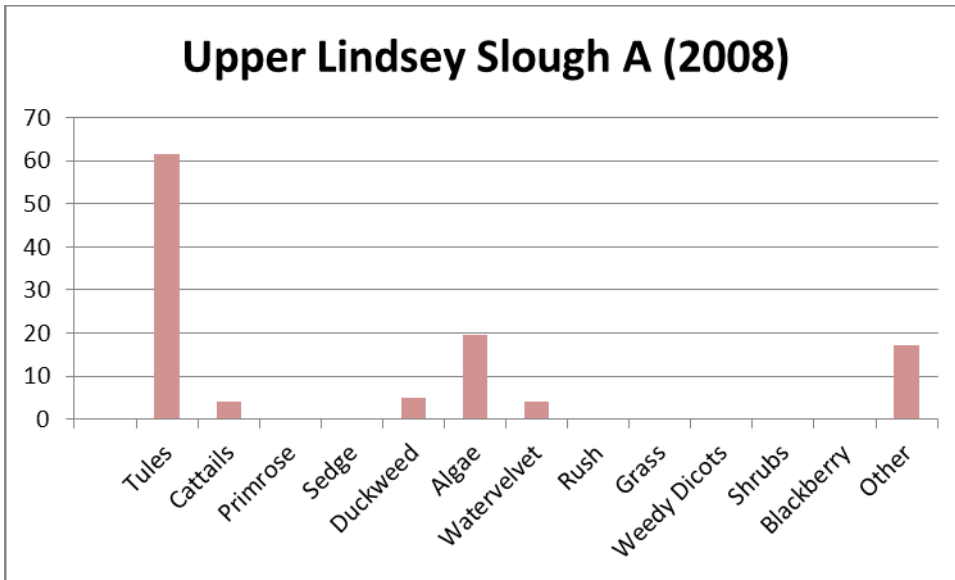


Figure 10. Vegetative characteristics adjacent to the Upper Lindsey Slough A trapline.

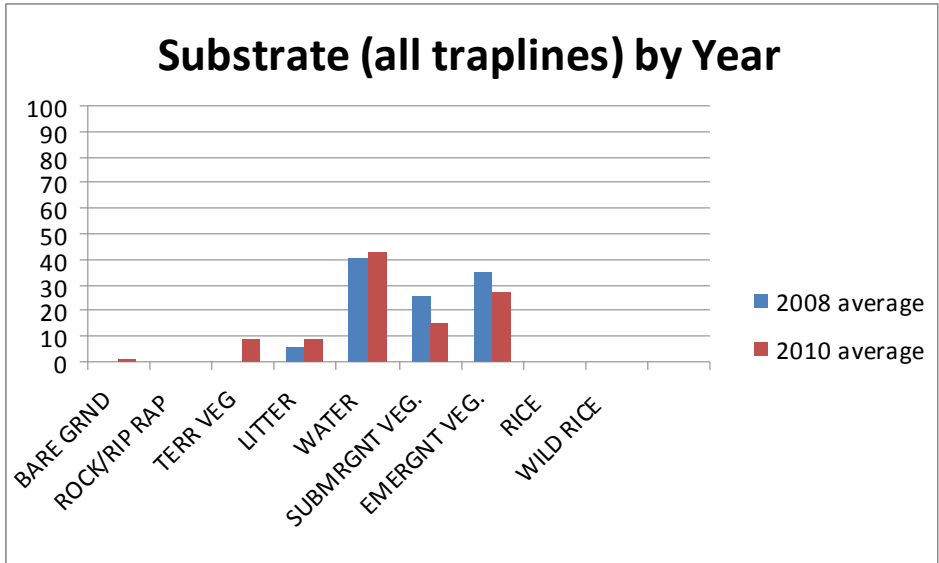


Figure 11. Average substrate characteristics adjacent to all traplines.

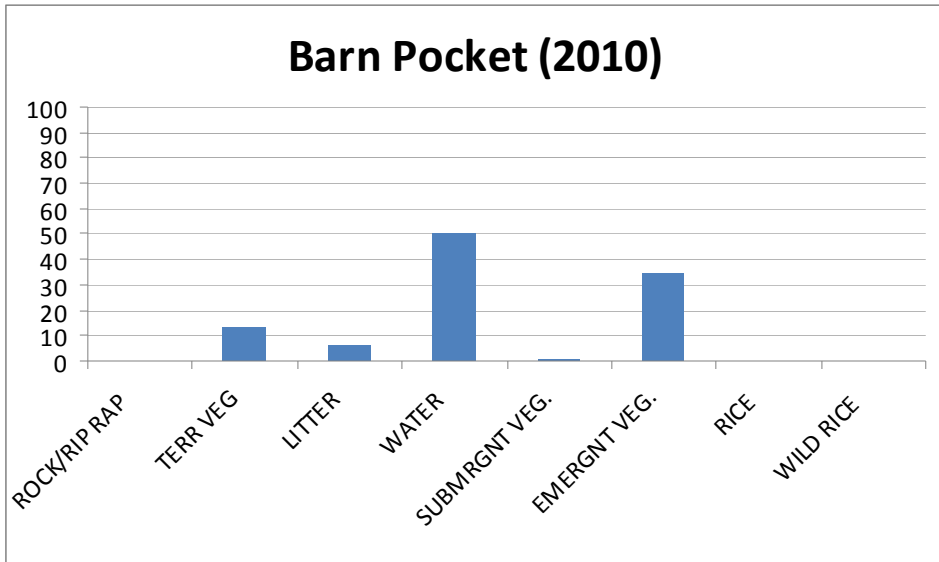


Figure 12. Substrate characteristics adjacent to the Barn Pocket trapline.

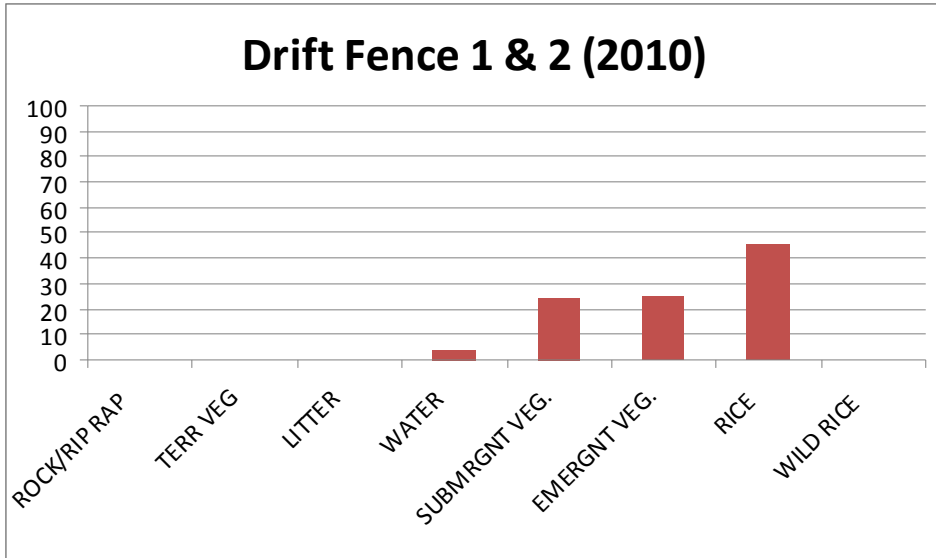


Figure 13. Substrate characteristics adjacent to the Drift Fence 1&2 trapline.

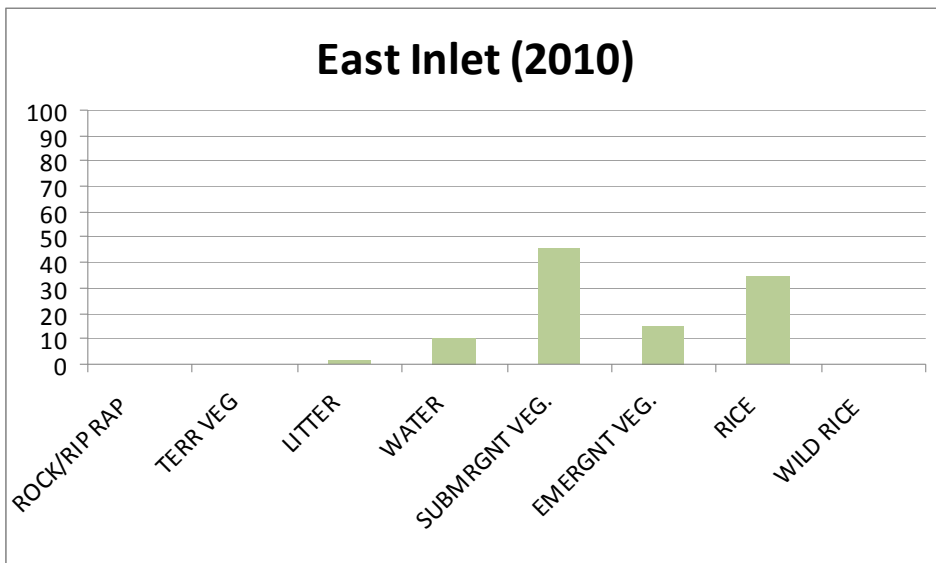


Figure 14. Substrate characteristics adjacent to the East Inlet trapline.

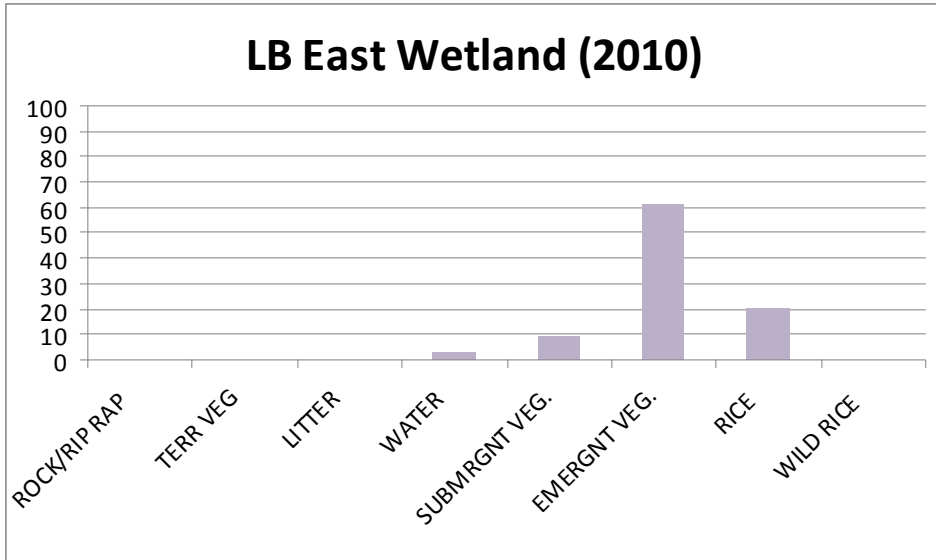


Figure 15. Substrate characteristics adjacent to the LB East Wetland trapline.

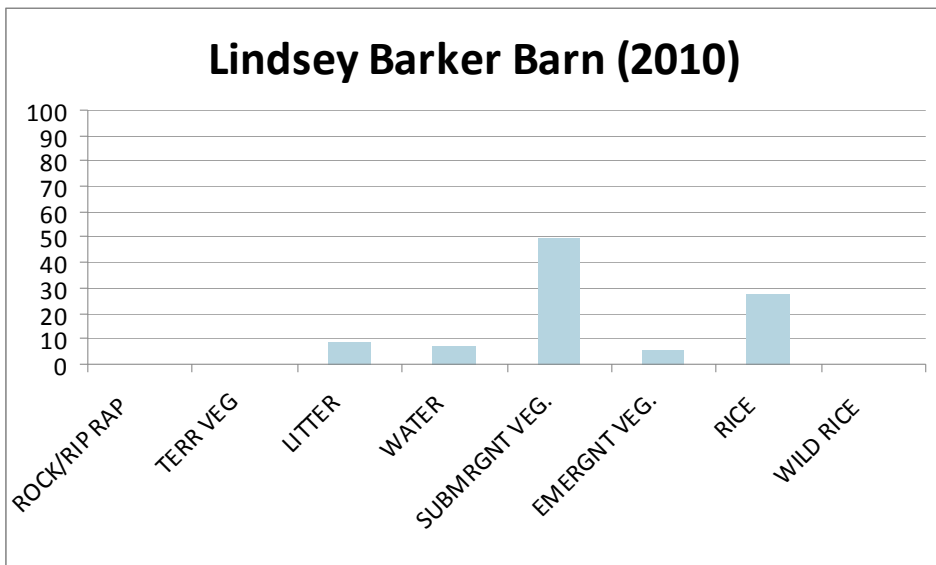


Figure 16. Substrate characteristics adjacent to the Lindsey Barker Barn trapline.

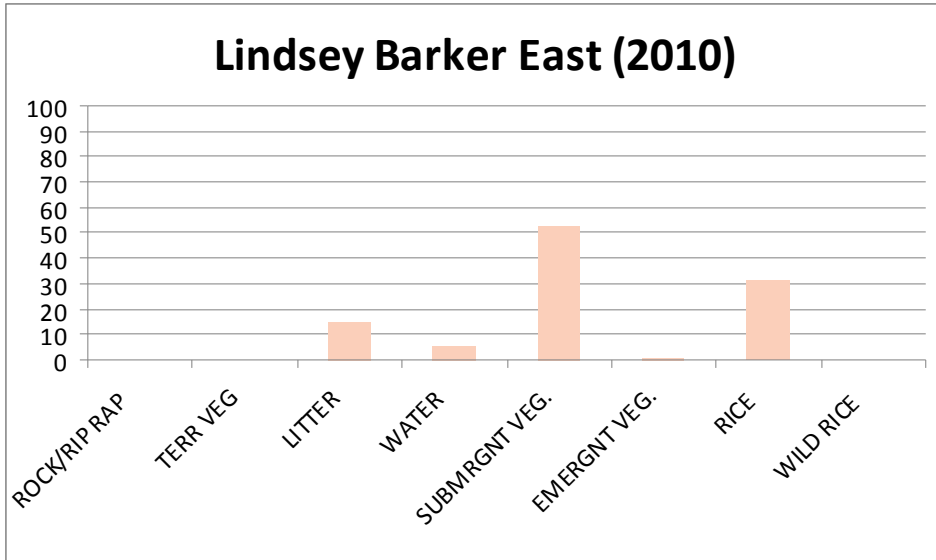


Figure 17. Substrate characteristics adjacent to the Lindsey Barker East trapline.

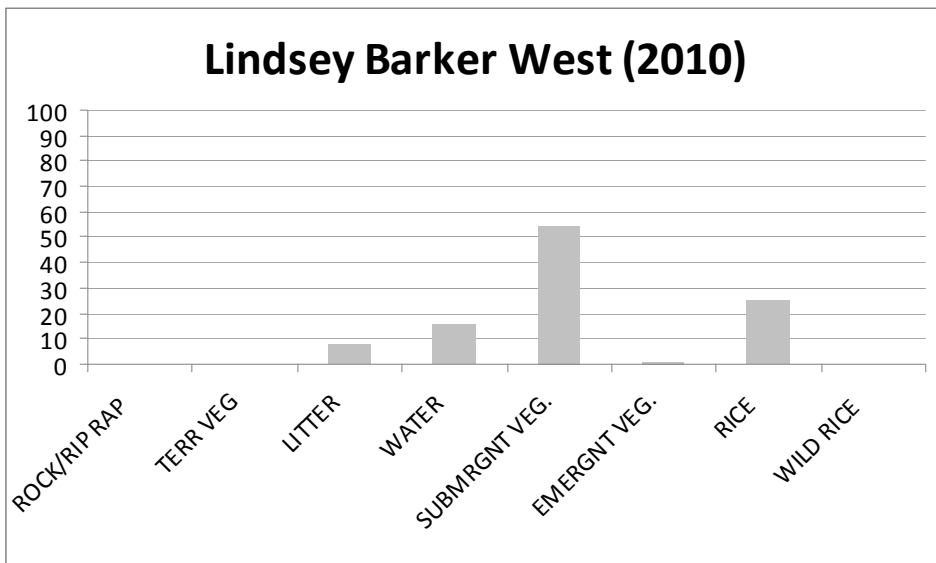


Figure 18. Substrate characteristics adjacent to the Lindsey Barker West trapline.

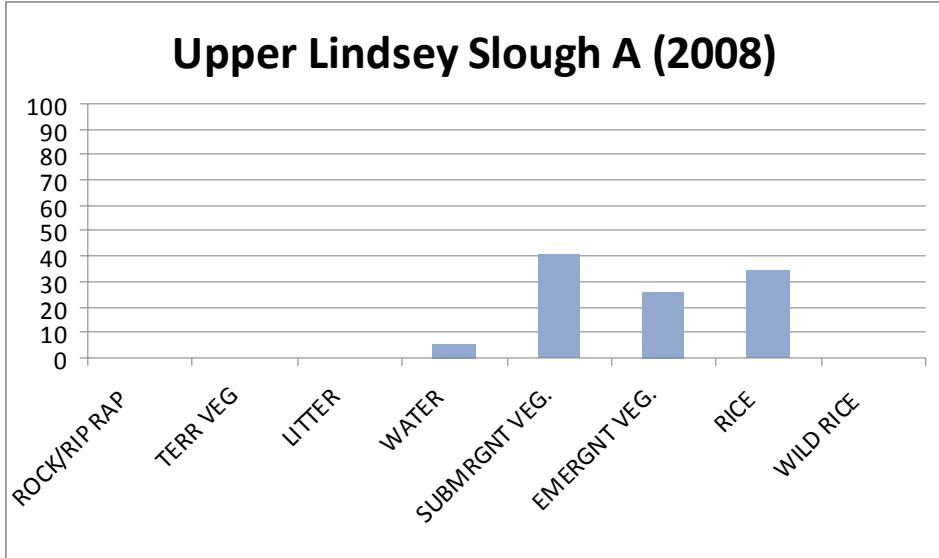


Figure 19. Substrate characteristics adjacent to the Upper Lindsey Slough A trapline.