Assessing Invasive Species Dominance Along the Salinas River

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Introduction

The primary goal of this research project was to map out and understand changes in the riparian habitat along the Salinas river over time. Riparian habitat represents extremely vital areas for the local ecosystem, providing nutrients, shelter, and buffers for a host of species. This was done in collaboration with our partner, Monterey Waterkeeper, to provide a basis for funding and grant applications, as well as to educate the public.

Research Questions

1. What percentage of plant cover is invasive compared to native?
2. What is the rivers health, as measured by RipRAM?

Conclusion

- Even though many species are native, low biodiversity
  - High abundance of Ca. Blackberry at 'native' sites
  - Giant Reed & Poison Hemlock most prominent invasives
- Agricultural activity bordering at a narrow riparian strip
  - Site 1 most degraded, greatest potential for restoration
- Lack of anthropogenic alterations to Salinas River and abundant connected vegetation cover across the river indicate potential for restoration and development for community use

Acknowledgments

We would like to thank our partner organization Monterey Water Keeper for their collaboration and support and our advisor Iris Stewart-Frey for her guidance.

References

Scan to access our references

Results

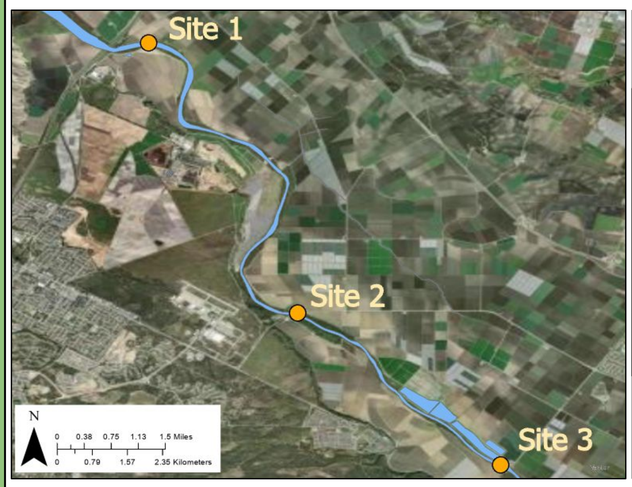

Figure 1. Field sites along the Lower Salinas River

Figure 2. Species identified by point contact survey at site 1

Figure 3. Species identified by point contact survey at Site 2

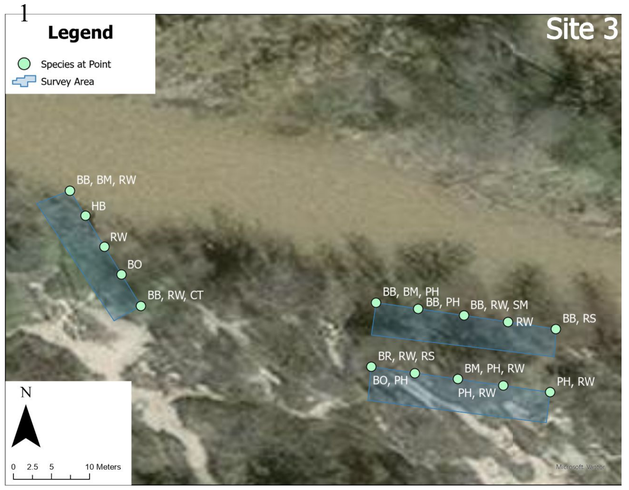

Figure 4. Species identified by point contact survey at Site 3

Site	Dist. (m)	Line A	Line B	Line C
1	0	None	BR	BR, BB, MB
	5	BB, GR	BR	BB
	10	BB, MR, CI, SN	BB, GR, MB	BB
	15	BB, CI, GR, PS	ST, GR, PH	BM, BB, CI
	20	MR	BB, GR	BB, CI, GR
2	0	BB	TT	BB, RW
	5	BB	BB	BB
	10	BB, PO, SN	RW	BB
	15	BB, GR, TH, WS	BB, YB	PW
	20	BB, PH, RW	BB	BM
3	0	BM, BB, PH	BR, RW, RS	BM, BB, RW
	5	BB, PH	BO, PH	ST, BB, RW
	10	BB, RW, SM	BM, PH, RW	HB
	15	RW	PH, RW	RW
	20	BB, RS	PH, RW	BO

100% Native

100% Invasive

Table 1. Invasive and native species distribution

Species	Abb.	Species	Abb.	Species	Abb.
California Blackberry	BB	Bristly Oxtongue	BO	Sow-Thistle	ST
Bulrush	BR	Petty Spurge	PS	Tropical Horseweed	TH
Giant Reed	GR	Marsh Baccharis	MB	Tree Tobacco	TT
Manroot	MR	Goldenrod	GR	Yerba Buena	YB
CI	CI	Poison Oak	PO	Pellitory of the Wall	PW
Poison Hemlock	PH	Red Willow	RW	Short Pod Mustard	SM
Black Mustard	BM	Stinging Nettle	SN	Rosilla	RS
Common Sow-Thistle	CT	White Sweetclover	WS	Hairy Bittercress	HB

Table 2. Species Abbreviations

Site	Metric 1 (Total Vegetation Cover)	Metric 7 (Macroinvertebrate Habitat Patch Richness)	Metric 8 (Anthropogenic Alterations to Channel Morphology)
1	100	75	100
2	100	50	100
3	100	75	100

Table 3. RipRam Metric Scores

Methodology

Species Identification:
Using a point contact survey, we surveyed each site at 5m intervals across 20m, cataloging the species abundance and diversity. We were able to identify species through a plant ID guide we created in addition to INaturalist. We chose to sample 9 sites total, with 3 subsites per each major research area. In addition we utilized a Garmin GPS device to accurately map our data points.

Habitat Evaluation:
Three RipRAM metrics (Riparian Rapid Assessment Method) were used to gather specific information regarding river health.

1. Total Vegetation Cover: Evaluated the severity and abundance breaks in land cover connectivity, such as paved roads and intensive agriculture, scored based on the percentage of connected habitat
2. Macroinvertebrate Habitat Patch Richness: The abundance of patch types larger than $3m^2$ that support macroinvertebrate, such as fine woody debris, were counted
3. Anthropogenic Alterations to Channel Morphology: Modifications to the natural flow of river due to man made alterations, such as embankments or hardening of river perimeter with walls, were examined and counted.

Next Steps

The current report advances our understanding of the Salinas rivers species abundance and health as a critical ecosystem. Further projects would increase the geographic range of survey areas further up river to have a more comprehensive understanding of the rivers health. Water quality sampling may be used to link trends found in this study with the external factors, such as agricultural runoff and pollution.

Figure 5. Picture from site 1. Vast farmland just past the railroad bridge, Bulrush in foreground