



CHALLENGE

Sixty thousand acres of shoreline biodiversity was being threatened. The impact of the invasive plant needed to be measured. And restoration success needed to be monitored.

SOLUTION

JMP® is used for visualization and analysis of the data gathered in monitoring and measuring the efficacy of the control work.

RESULTS

The invasive species is being controlled, and mudflats are accommodating native animals, including the endangered California Clapper Rail.

MORE INFORMATION

www.spartina.org

www.jmp.com

San Francisco Estuary Invasive *Spartina* Project

Forging a future for an endangered bird

It came from the East in the early 70s—the invasion of the *Spartina alterniflora*. Planted by the Army Corps of Engineers in a marsh restoration project, it's an East Coast species of cordgrass called *Spartina*. From the outset, it didn't get along with the locals.

The West Coast has its own *Spartina*—a more laid-back version, of course—which has been there for millennia. That *Spartina* is a comfortable fit for the West Coast marsh, which has a lot of mudflats that support a number of little critters that shore birds use for foraging. Without those mudflats, the concern is that the birds would lose their foraging habitat," says Ingrid Hogle, Monitoring Manager for the San Francisco Estuary Invasive *Spartina* Project.

The East Coast *Spartina* is more aggressive than its West Coast relative; it began spreading into the mudflats, destroying the birds' foraging habitat.

The mudflats are home to a number of shore birds: dunlins, avocets, curlews, sanderlings. But "at the top of our radar," says Hogle, was protecting the habitat of the endangered California Clapper Rail, a bird that is principally found in the San Francisco Bay and that feeds in the mudflats.

The situation was getting bad; then it got worse. The East Coast *Spartina* began consorting with the local *Spartina*, creating what Hogle calls a "hybrid mess."

"We had this super cordgrass that is incredibly invasive," Hogle says. "It invades not only the mudflats but also farther upland than the native can grow. Within the area that's naturally vegetated, it outcompetes all the other marsh vegetation.

"So the fear among the restoration community was that this hybrid cordgrass would come to completely dominate the entire marsh and mudflat communities anywhere it found a foothold."

Sixty thousand acres of shoreline biodiversity was being threatened. The California Coastal Conservancy mounted a rescue effort by creating the San Francisco Estuary Invasive *Spartina* Project (ISP) in 2001. After extensive research into the environmental effects of control options, herbicide proved to be the least invasive control measure—a particular herbicide called imazapyr.

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“I think the automatic presentations of the graphs are very nice. The colors are really vivid and clear, which is great when you’re presenting your results.”

Ingrid Hogle

As monitoring program manager, Hogle is tasked with doing a full inventory of all the invasive *Spartina* in the area. She must make sure all data is edited, proofed, mapped and made available to all parties involved in the project, who also use that data to analyze the efficacy of their control work.

JMP® statistical discovery software is used for this

“All of our spatial data and attribute data are stored in a geographically referenced [Microsoft] Access geodatabase,” notes Hogle, “and JMP has this wonderful capability that allows you to pull your data and be given automatic updates: Any updates that you make to your data in one program are easily accessed in JMP. That’s fantastic.

“I really do love the fact that you can seamlessly pull new data into JMP.”

Hogle says she also appreciates how easy it is to summarize data with JMP and to present that data in easy-to-read tables.

“JMP is great for exploratory data analysis because you can label everything differently,” Hogle says. “I can label each *Spartina* species with a different color or a different symbol. I can then lasso the outliers and find out if that’s because of an error in data entry or because of something that’s actually going on in the field that we need to address.”

Hogle also likes JMP software’s graphing capabilities: “I think the automatic presentations of the graphs are very nice. The colors are really vivid and clear, which is great when you’re presenting your results.”

Hogle and her colleagues are now seeing positive results—results that JMP will be used to analyze. The interlopers are being beaten back. Foraging ensues.



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