



Spartina DISPATCH

Quarterly Newsletter of the San Francisco Estuary Invasive *Spartina* Project

Field Note

The 2008 *Spartina* control season has been the most comprehensive to date. ISP partners seized on the ability to access target marshes earlier in the season, performing treatment during better tides and weather conditions than in past years. The wider window of opportunity improved resource coordination between partners.

As a result, in contrast to past years, most sites were treated before September—well before plants flowered. This means very little seed production for spreading the infestation to new sites.

At the beginning of the season, the ISP estimated some 300 acres of non-native *Spartina* remaining scattered around the Bay. With this year's advantageous treatment schedule, we expect to see that number drop to under 100 acres by next year.

And while this smaller number does represent a significant and noteworthy accomplishment by ISP partners, we all got a taste of the difficulty involved in treating those remaining stands scattered throughout wide marshes this year. We still have work ahead, but of a different sort.

But for now, thank you and congratulations to all ISP partners for a great control season!

Erik Grijalva
Field Operations Manager



Photo by I. Hogle / ISP

Ken Hutchins of Native Range, Inc. pilots a small helicopter close to the marsh surface along the Alameda Flood Control Channel, giving the ISP biologist riding with him a way to spot remaining *Spartina* clones and sprouts that's easier and faster than on foot.

The changing face of *Spartina* control

Progress brings new challenges, methods

It's no secret that ISP has turned the tide against invasive *Spartina*. By any measure the infestation is getting smaller and will probably shrink even more rapidly in the next few years, with treatment now permitted earlier in the season. (See Greater expectations, p. 3)

However, with success come new challenges. Because the nature of the *Spartina* infestation changes as it diminishes, further progress in eradicating the troublesome weed means ISP must adopt new strategies and techniques.

"Before, we had an invasion that was

large and expanding," said ISP director Peggy Olofson. "For the first few years our focus was on all those things that were in your face, highly visible."

Now, with fewer areas of large infestation, current work requires more targeted control to knock out the remaining patches within previously uniformly infested areas. Broadcast spraying over large sweeps is increasingly replaced by spot treatments of the hunt and peck variety.

"In some of the marshes that we've been treating, you can't even see stubble

continued on page 2

Inside

Greater expectations . . . p. 3

Partner Focus: ACFCF . . . p. 6

ISP is moving p. 2

ISP office moves next door

Well, almost next door. The office is moving a short block and a half away from its present location on October 1.

ISP will continue to share space with most of its current suite mate organizations—California Invasive Plant Council and Restoration Design Group—at its new home. Phone and fax numbers will remain the same.

Please remember to record our new address in your address books and database files:

**2612-A 8th St.
Berkeley, CA 94710-2514**



Changing

continued from page 1

where there were once thick meadows of eight-foot high *Spartina*,” said Erik Grijalva, ISP’s field operations manager. “In some marshes, native pickleweed has come in, and you can’t even tell that there was ever a *Spartina* infestation there.”

In 2005 ISP began aerially spraying across the heavily infested sites throughout the Bay, covering approximately 1,350 acres. The following year, 1,050 acres were sprayed aerially, and in 2007, about 750 acres. This year’s aerial treatment continues the downward trend, with fewer than 500 acres treated. As always, treatment is targeted to spray only invasive *Spartina* plants. About 300 acres of *Spartina* within these 500 acres needed to be sprayed.

Each year treatment results keep improving, as the ISP, and its partners and contract personnel, gain more experience and refine techniques for aerial and ground herbicide application and manual removal. Many marshes used to be treated in late summer and early fall when herbicide applications are less effective. With the U.S.

Fish and Wildlife Service now permitting earlier treatment, ISP anticipates that from now on treatment results will be more consistently positive, showing less variation between marshes.

While this means a lot less herbicide is used, the work is becoming increasingly labor intensive as a greater proportion of *Spartina* control takes place on the ground. Crews walk through marshes carrying 40-pound backpack sprayers tracking down these last small patches and sprigs, sprouts from plants that refuse to die or seedlings coming up here and there. Such regrowth is usually low to the ground and easily hidden.

“That’s a lot harder,” said ISP field operations assistant manager Drew Kerr. “With aerial treatment you can do 500 acres in a couple of days. You’re lucky to cover five acres in a couple of days on the ground.” Even with fewer and smaller plants to spray, crews still have to cover the same ground area. And dead plants can sometimes hide new growth.

continued on page 4



A young invasive *Spartina* shoot nestled amongst native pickleweed, left, requires careful, close inspection to spot. Even in comparatively bare surroundings, new spouts, below, comparable in height to the size of a footprint, present detection challenges.

ISP staff photos



Preserving native wetlands

2612-A 8th St.
Berkeley, CA, 94710
(510) 548-2461
www.spartina.org

The San Francisco Estuary Invasive Spartina Project (ISP) is a coordinated regional effort to address the rapid spread of four introduced and highly invasive *Spartina* (cordgrass) species in our bay.

Established by the California State Coastal Conservancy in 2000, the project is progressing toward its goal of eliminating this aggressive introduced species, working in close collaboration with its many partners around the Bay. This newsletter helps keep our partners informed about project news and activities.

Current ISP funding comes from the CAL-FED Bay-Delta Program, the California Wildlife Conservation Board, and the California State Coastal Conservancy. Previous major funders also include U.S. Fish and Wildlife Service and National Fish and Wildlife Foundation.

PROJECT DIRECTOR
PEGGY OLOFSON

FIELD OPERATIONS MANAGER
ERIK GRIJALVA

FIELD OPERATIONS ASSISTANT MANAGER
DREW KERR

MONITORING PROGRAM MANAGER
INGRID HOGLE

CLAPPER RAIL MONITORING PROGRAM MANAGER
JEN MCBROOM

NEWSLETTER WRITER, EDITOR & DESIGNER
STEPHANIE ERICSON

STATE COASTAL CONSERVANCY PROJECT MANAGER
MAXENE SPELLMAN



Coastal
Conservancy

ISP Partners – Current Grant Recipients

- ALAMEDA COUNTY PUBLIC WORKS DEPT.
- CALIFORNIA DEPT. OF PARKS & RECREATION
- CALIFORNIA WILDLIFE FOUNDATION
- CITY OF ALAMEDA
- CITY OF PALO ALTO
- CITY OF SAN LEANDRO
- EAST BAY REGIONAL PARKS DISTRICT
- FRIENDS OF CORTE MADERA CREEK WATERSHED
- FRIENDS OF PETALUMA RIVER
- U.S. FISH & WILDLIFE SERVICES, DON EDWARDS NATIONAL WILDLIFE REFUGE
- SAN MATEO COUNTY MOSQUITO ABATEMENT DISTRICT

Greater expectations

Getting the weed before it seeds

With the ISP control effort in full swing during the last couple of months, ISP's field operations staff have been at their busiest, working long hours—often tired, but also quite pleased.

That's not just because recent field surveys confirm that the project continues to make progress in reducing invasive *Spartina* around the bay. They are also keenly aware that such progress is about to get even better, thanks to a finding by the U.S. Fish and Wildlife Service earlier this year, issued in July, which will allow treatment earlier in the year than in the past.

After reviewing data gathered in recent years, the agency concluded that endangered California clapper rail would not be unacceptably affected by ISP's control efforts if it began during the latter part of the rail's nesting season, and that, in fact, getting rid of invasive *Spartina* eradication would preserve rail habitat in the long term. The USFWS finding extends for three years.

Because much of the estuary affected by invasive *Spartina* is considered clapper rail habitat, the impact of this decision is huge. Some adjoining areas without rail habitat will also benefit since their treatment is often scheduled together, especially for aerially spraying.

In most sites with rail habitat, ISP is now permitted to start treatment on June 1, three months earlier than in the past. In areas infested by *Spartina densiflora*, which flowers earlier than other *Spartina* species in the Bay, treatment can begin May 1. This is primarily in Marin County.

"Before we were only able to do treatment after the plants ... had already produced seed, and the seed had already been set and gone off on the tides," noted ISP director Peggy Olofson. "So while we may have been successful in treating the particular plant... often the seeds were already out."

Now, by getting into marshes

earlier, treatment should be more comprehensive and effective.

"Right now with the momentum we've gotten in the number of sites already com-

The herbicide is more effective when applied to plants during their active growth period, and the earlier application prevents spreading by seed dispersal.

pleted, and the ones coming up (soon), we're in a good position for the first time to really hammer the entire infestation," pronounced ISP field operations manager Erik Grijalva earlier this month.

"It's because we've gotten into so many sites and treated them when the plants are actively growing and have hardly begun flowering yet," explained ISP field operations assistant manager Drew Kerr. In the case of the *Spartina densiflora*, he added, it is the first year these plants were treated before going to seed.

Not only is the herbicide used, imazapyr, more effective when applied to plants during their active growth period, but the earlier application significantly reduces spreading by seed dispersal. This also applies when *Spartina* is dug out rather than sprayed, a practice ISP advocates where feasible.

Because the USFWS decision wasn't issued until July, its full benefit won't be realized until next year, when treatment can be planned for May and June in many cases. Such timing can only increase the success of treatment efforts.



Photo by Jesus Castillo

California clapper rails like this one live in a number of marshes in the San Francisco Estuary. The US Fish and Wildlife Service recognizes that the endangered bird's habitat is threatened by the spread of invasive *Spartina* and now permits earlier entry into marshes with rail habitat to improve *Spartina* eradication efforts.

Changing

continued from p. 2

“It’s also harder to decipher which plants need to be treated now, too,” he continued. “You have both sublethal impacts from previous years and you have this variety (among the invasive *Spartina* hybrids). You just don’t have these big robust plants that are so easy to see from hundreds of meters away.”

Another change in control work comes with treating plants earlier in the year. When working in marshes that have clapper rail, those who apply the herbicide are now present during the tail end of the bird’s nesting season and must take care not to disturb nests of rail young.

“We are training treatment personnel to be sensitive to the potential location of clapper rail nests,” said Olofson. “They never used to have to be concerned about them so this is a whole new thing that weed control people never had to deal with before.”

New tools for *Spartina* detection

With treatment success, ISP’s monitoring work also has evolved, and the results are becoming even more critical to control efforts.

“It’s a lot different to treat a site with little bits of *Spartina* sparsely distributed throughout than to treat the same site with a dense meadow confined in one area,” said Olofson. “It requires very precise monitoring to get accurate information to control program workers and the quality of the information will very much affect how the work will be done.”

Field biologist Tripp McCandlish remembers the earliest monitoring efforts of the project, when four people surveyed the entire bay.

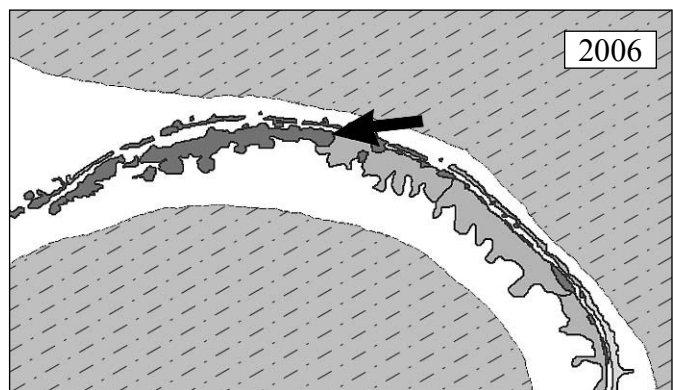
“We couldn’t survey quite as in depth, but that was okay because there were large, visible plants,” recalled McCandlish, now in his fifth summer with the ISP. The first year, the monitoring crew inspected the marshes by foot, kayak, and even bicycle.

“We could cover large amounts of ground because you could see the clones from so far away,” said McCandlish. “We did a lot of estimating... There’s less *Spartina* now but more work.”

That’s because the field biologists

The change from thick meadows to smaller, spottier infestations are evident in these photos of Ravenswood Slough by the Dumbarton Bridge in Menlo Park, taken in the same location each of three consecutive years. Below each photo is a corresponding map with invasive *Spartina* shown in gray polygons.

The darker shades indicate denser infestation; arrows mark the camera’s location and angle for the photos. The area in white denotes the area (both land and water) where *Spartina* will grow.



Photos and maps by ISP staff

must record a large number of distinct small patches precisely, instead of the small number of large swaths of solid *Spartina* meadows prevalent in past years.

Moreover, ISP biologists are taking greater numbers of DNA samples and recording more information about each sample because genetic testing has increased in importance for plant identification. As the plants in the “hybrid swarm,” a genetic mix of native and invasive *Spartina*, continue to cross and backcross with each other, they produce greater variation in appearance, adding to the challenge of correct identification. (See “DNA lab tackles hybrids,” May 2008 issue.)

In addition to this variation, said ISP monitoring program manager Ingrid Hogle, those invasive hybrids that treatment has weakened but not killed can look like native *Spartina foliosa* because they’re short.

“But then you get up close and see they have super wide leaves, red stems, thick stems, that kind of thing, so you know that it’s non-native hybrid,” Hogle

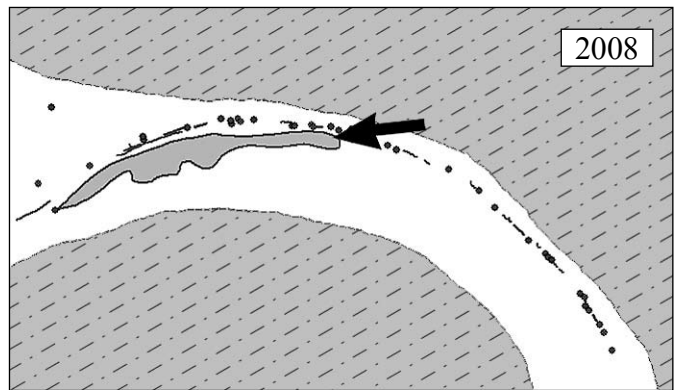
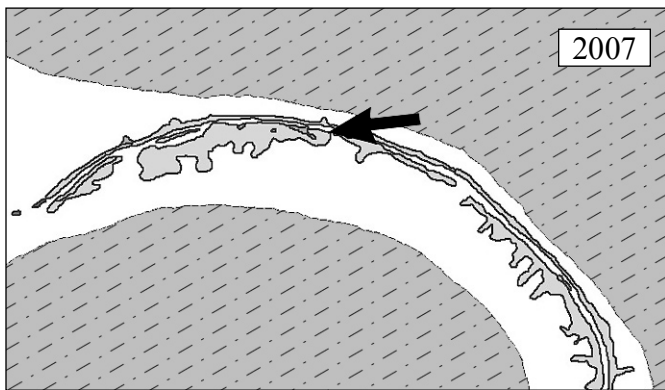
explained. “You really have to be on top of it to see it.”

These monitoring challenges make the work much more time consuming, so Hogle has streamlined data collection to help speed things along.

“We’re trying to make our program more lean and mean, just recording the essential information,” said Hogle. That means just recording the percent cover of non-native *Spartina* and skipping data about marsh elevation and other native vegetation present, which are not particularly relevant to ISP’s highly focused mission.

But she created one new measure, “treatment cover,” to help the control program staff estimate how much herbicide is needed to treat an area. That is, a patch, recorded as a polygon on a GIS monitoring map, may have a “botanical cover” of 30 percent (meaning 70 percent of the ground is visible), but its treatment cover, the percent of the area that must be treated, is often greater, up to 100% if the vegetation is distributed evenly.

To handle the additional workload,
continued on next page



ISP's monitoring crew has grown to nine field biologists, approximately double last year's number.

Upgraded mapping software lets ISP biologists bring past years' mapping data with them in the field on GPS units. Coupled with the increased staffing, this means ISP can use their GPS units to navigate back to every patch of *Spartina* recorded over the last several years, something not previously possible, to look for potential stems of stunted regrowth.

Over the years ISP enhanced its ability to efficiently monitor throughout the estuary by incorporating use of a variety of motorized watercraft—including inflatable boats, whalers and airboats—in addition to the kayaks used from the start. This year the program is also starting to survey by helicopter, after test runs in late July confirmed its usefulness in many marshes.

Large marshes without adjacent levees are hard to thoroughly survey. These used to be surveyed from a distance with binoculars, but today's treatment results require a closer look to find all the stunted or sparse regrowth.

"To walk through a marsh like Dumbarton Audubon, for example, search and rescue style with ten people walking abreast looking for non-native *Spartina* would be really destructive," Hogle explained. "We're supposed to minimize our impact walking through the marsh, especially when getting in early during the clapper rail nesting season."

The helicopter does just that. It's small, about the size of a pick-up truck, and can fly quite low. It can also touch down, allowing monitoring personnel to hop out to get a leaf sample for DNA analysis when needed and hop right back in. This leaves a much smaller footprint than walking through the marsh to and from the site.

"(In our test run) it felt great because we were able to survey every square inch of the marsh, getting a birds-eye view, (which made) *Spartina* super easy to identify," she said.

The ISP's helicopter monitoring contractor, Native Range, Inc. (formerly Pro-Hunt, Inc.) previously assisted vegetation monitoring on Santa Cruz and Catalina islands. Olofson notes that its pilots are

used to flying in unusual terrain and contending with marine air layers, their wind currents and the tidal cycles. They are also experienced at flying close enough to the ground to identify invasive species, she said.

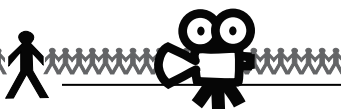
***Spartina* prognosis: more change ahead**

As the nature of the remaining infestation continues to change, the monitoring program techniques are evolving along with it, said Olofson. The helicopter is a case in point. Since 2001, ISP used infrared aerial photography to map invasive *Spartina* patches in many large infested sites.

But that didn't work so well last year, Olofson said, because it was hard to distinguish between live and dead *Spartina*.

"Our monitoring program manager has had to adapt our methods rapidly as she goes along..., Olofson said. "It has to be done very quickly because we need the information right away."

Monitoring by helicopter, too, will likely give way to another method, **continued on page 8**



Alameda County Flood Control District

When Saul Ferdan took over as weed and pest control supervisor for the Alameda County Flood Control District, he faced a discouraging situation. The district includes one of the locations where invasive *Spartina* was originally introduced into the estuary—in the mouth of the Alameda Flood Control Channel. By the time Ferdan arrived, it had expanded into one of the largest infestations in the Bay.

This was four years ago, before the Invasive *Spartina* Program had made a serious dent in controlling the invasive weed. In addition to the flood control channel, the district's infestation covered parts of San Leandro Bay and large areas of Old Alameda Creek and the adjacent marshes and channels.

Ferdan's predecessor had tried spraying the weed with glyphosate, the only herbicide permitted for use in the sensitive tidal marsh environment at that time, which Ferdan also used his first year in this job.

"Looking at the results the following year, we really weren't making a dent in it,"



Photo by S. Ericson / ISP

Weed and pest control supervisor Saul Ferdan, right, and vegetation technician Doug Cryer are committed to getting rid of invasive *Spartina* in the flood control district.



Photo by S. Ericson / ISP

Weed and pest control supervisor Saul Ferdan, left, and vegetation technician Steve Landucci consult on locations for aerial spraying of *Spartina* clones.

he said. The plants would initially die back, he explained, but revive the next year. Moreover, the work was hard and many areas were difficult to access. Ferdan pointed to a picture of his crew working from a truck next to a large marsh.

"Just the physical activity alone," he said. "You go all the way out there with the hose, spray that clone, and then roll the hose back up and then walk out of there. That was when we first started and why I was giving up on it."

The district purchased a Hydro Traxx, an amphibious all-terrain vehicle that can maneuver through a marsh, allowing a crew of two or three people to reach remote clones more efficiently. The vehicle's relatively low ground pressure also has less impact on sensitive vegetation and soft mud.

But even with a Hydro Traxx, the work is difficult.

"You see that Hydro Traxx

in there?" he said holding another photo. "Look at how high the *Spartina* is. These guys are in a vehicle and this stuff is above their heads."

Like others grappling with the infestation around the Bay, Ferdan found that the real turn-around came with approval in 2005 to use imazapyr, a more effective, if more expensive, herbicide, along with the introduction of a regional approach to the infestation.

"Part of it is funding, part of it is having an appropriate material that will control it well and the other part of it is having all of the environmental studies and assessments done so that you can go forward," Ferdan said. "Between the imazapyr and the helicopter and the grant from the Coastal Conservancy, we were able to deliver a significant blow to that particular invasive weed."

Not surprisingly, the flood control district was an early and eager ISP partner.

"They have some excellent crews who have taken this on as a personal crusade,"

continued on next page



The flood control district's amphibious vehicle usually provides efficient access to those remote *Spartina* clones in the marsh, but it occasionally succumbs to the mud. Vegetation technician Steve Landucci works first to loosen its grip, then steers as colleague Doug Cryer cranks the truck winch to pull it free. Such challenges require two or three-person crews for ground control work.

Photos by S. Ericson / ISP



commented ISP field operations manager Erik Grijalva. "They don't necessarily enjoy the work, but they've taken it to heart."

Since it's their business to keep vegetation out of channels—cattails, for example—flood control personnel possess valuable aquatic weed control experience and an ongoing awareness of channel conditions. They regularly inspect over 330 miles of creeks and channels in Alameda County.

From the beginning, they assisted in surveying for *Spartina* and presently continue to point out patches that might otherwise be overlooked, including those on adjoining areas not under their jurisdiction. Once alerted, ISP can contact the

property owners and arrange for treatment.

District vegetation technician Steve Landucci noted that he's reported on areas where the infestation has gone further up channels than ISP had expected. He also exemplifies the enthusiasm for the work and can-do attitude noted by Grijalva. Landucci can often be found at the helm of the Hydro Traxx maneuvering boldly and expertly around the marsh, or, occasionally, energetically pulling it out of the mud, with the help of a fellow crew mem-

ber, some chains and a truck.

Ferdan estimates that by this summer they had reduced invasive *Spartina* by about 85 percent overall, with some variation between different areas, and Grijalva expressed hopes that this year's treatment will bring the infestation down to about 5 percent of its former expanse.

"The crew are the ones to whom all the credit goes," Ferdan said. "Because even though we organize it and set up the resources, ultimately it's those guys that make it successful."

Back in the saddle again. Steve Landucci's knowledge of the marsh terrain and experience driving the amphibious Hydro Traxx keeps stuck-in-the-mud incidents to a minimum. Landucci is also adept at spotting the remaining *Spartina* clones amongst other marsh vegetation.

Photos by S. Ericson / ISP



Changing

continued from p.5

possibly a return to remote monitoring through aerial photography, but with a more sophisticated twist.

ISP is exploring the possibility of an “expert system,” a computer program guided by human expertise, to specifically search out invasive *Spartina* in high-resolution aerial photographs. It has contracted with GDA Corporation to develop a prototype system, writing and refining a computer algorithm for a reliable *Spartina* mapping program using remote sensing techniques. The effort got fully underway in January.

“This approach apparently stemmed from looking for cancer cells in the medical field,” said Olofson, noting the analogy of aggressive cancer cells to invasive plant species.

The challenges of detecting hybrid *Spartina* this way may be somewhat daunting given its variability. But when comparing photographs from one year to the next, its aggressive nature may be an advantage.

“There aren’t many things in the bay that could grow that quickly—that will

not be there one day and a year later be a round clone three meters in diameter. That expansion rate and the plant’s presence within the tidal marsh or mudflat will raise a red flag, alerting someone to look more closely,” said Olofson.

ISP will keep looking for additional monitoring methods, in case this doesn’t work well enough, or something else works better. It’s part of Olofson’s commitment to have a variety of tools at the ready to keep up with the dynamic nature of the infestation.

Surprisingly, one such method might be using specially trained dogs that can track plants by scent, just like tracking drugs or lost people. In the state of Washington, dogs have been effectively used to track *Spartina patens*, another invasive *Spartina* species currently at only one location in the San Francisco Bay.

Olofson and Hogle are also looking to enhance *Spartina* DNA sampling capability. As the backcrossing of hybrids continues, some of the plants in subsequent generations will be more genetically diluted. They worry that the handful of genetic *Spartina alterniflora* markers currently used in genetic testing may not be

enough.

That puts developing new DNA markers on ISP’s “to-do” list. This might include looking for a different type of marker that is used in what is called microsatellite analysis. (See “DNA lab tackles hybrids,” May 2008 issue.)

But ISP’s greatest concern, Olofson said, is the long-term picture, when eradication is ostensibly completed. A new recognizably invasive hybrid plant could suddenly arise out of a chance recombination of DNA from genetically dilute parent hybrids. Or new seeds might be brought into the estuary inadvertently.

“This is going to be the big trick, getting long-term monitoring in place and getting long-term response for when the Invasive *Spartina* Project is no longer an entity,” she said. “There has to be someone going out and taking care of the plant when it shows up in the marsh.”

So the real challenge, she said, will be to develop the institutional memory for all the partners and institutions around the bay to prevent invasive *Spartina* from re-establishing a foothold in the San Francisco Estuary in the future.



San Francisco Estuary Invasive *Spartina* Project
2612-A 8th St.
Berkeley, CA 94710