

Invasive Species Work at Redwood National and State Parks, 2015

Laura Julian, Invasives Biotechnician

In 2015, 628 gross acres of invasive plants were treated at Redwood National and State Parks. 2,358 hours were spent manually and chemically treating 21 species at 52 project areas. 101 new invasive occurrences were inventoried, a total of 3.06 gross acres and 2.2 density adjusted acres of new invasives.

Highlights

Blackberry Mapping. Blackberry mapping continued in the Bald Hills. Volunteers Seher Khan and Nathen Van Sickel built on the work they had completed in 2014, mapping an additional 1.32 gross acres, (0.94 density-adjusted acres), of Himalayan and cutleaf blackberry at Maneze and Childs Hill Prairies in 54 separate occurrences. These data will be used to formulate a comprehensive approach to treating invasive blackberry at Redwood National and State Parks.

Three-cornered Leek. This year three-cornered leek was treated a second time with herbicide. The infestation along the road to the Redwood Creek Trailhead was sprayed with a 1.5% solution of Aquaneat, using Inlet as the adjuvant. The occurrence on both sides of the road was treated once at maximum bloom. Three-cornered leek at Nickel Creek and at Freshwater were also chemically treated.

Shining Geranium. In 2015, Cal Trans took the lead treating ROW shining geranium infestations in Humboldt and Del Norte Counties. Milestone was applied at all sites in mid-May. Domenic Bongio, District 1 Landscape Specialist for Cal Trans reported that the treatment worked well, but that perhaps it would have been more effective a month earlier. All infestations, as well as newly discovered populations of shining geranium were retreated by Cal Trans on October 21st, with Garlon 4. Populations found in RNSP (Hamilton Road, Crescent City Overlook and Crescent City Headquarters were treated by a combination of hand-pulling (State Park land) and herbicide, (National Park land, 1.5% Aquaneat). National Park employees did follow-up manual treatment (28.75 hours) at Crescent City Headquarters, Hamilton Road, Crescent City Overlook and at the HUM299 mile marker on Hwy.101.

Yellow Star Thistle. No new rosettes were found at previously infested sites.

Tocolote. Tocolote, *Centaurea melitensis*, also known as Maltese starthistle, was discovered by NPS seasonal Tim Marsh in the Bald Hills Prairies at Counts, Lyons Ranch and Coyote Creek. Plants were hand-pulled if they had not yet gone to seed; otherwise they were mapped for future treatment.

Invasive Brooms.

Bald Hills. All known broom (*Cytisus scoparius* and *Genista monsessulana*) occurrences in the Bald Hills were visited in the growing season (January through June). The bulk of this work, (308 treatment hours), was accomplished by vegetation management seasonal Tim Marsh, helped by HSU spring interns, VIPS, GeoCorps intern Sal Amador and vegetation management summer seasonals. 307

mapped occurrences, (277.13 gross acres, 3.22 density-adjusted acres) from Eastside to the Tall Trees Overlook, were visited and treated.

Westside Access, Geneva and Holter Ridge. Small infestations of broom found roadside in the Westside access were revisited and treated. A large “old growth broom” infestation reported by Neal Youngblood on the A-100 was treated by Tim Marsh and Sal Amador. 44 hours of work was necessary to completely treat the area. In addition a small, previously untreated broom occurrence on the W-Line below Elk Camp Prairie was discovered, mapped and treated. Follow-up visits were made to all the known broom locations on Geneva / Holter Ridge Road.

Hiouchi, North Operations Center, Smith River Gravel Bars and Story Ranch. Broom infestations in the north part of the park have received very little attention, due to lack of resources. Thirteen hours were spent treating the broom at the eastside of Hiouchi Flat, and 16 hours were spent doing follow-up broom work at North Operations Center. Shut-out of working in the Bald Hills because of wildfire smoke, the Harding crew put in 27 hours of work treating broom on the Smith River gravel bars. No volunteer groups worked in the north part of the park this year. At the request of the Park Superintendent, a public work day was held at Story Ranch, in partnership with Elk River Rancheria. There were no participants from either the Rancheria or the National Park, with the exception of the event organizers: two members of NPS vegetation management staff and the tribal Natural Resources biologist put in 18 hours removing broom near the quarry and along the fenceline at Elk Valley Road.

European Beachgrass. We have been unsuccessful in keeping the infested acreage of beachgrass at Freshwater from expanding. This year this species was targeted by holding two public work days on the beach, (Appendix A). Volunteers put in 37.5 hours mapping, monitoring and retreating European beachgrass at Freshwater. All 68 previously mapped occurrences were monitored, and an additional 31 new occurrences were mapped. European beachgrass currently covers 2.02 acres, (0.81 density-adjusted acres), at Freshwater Beach.

Harding Grass. Between the first of July and October 21st, 1,177 mapped occurrences were retreated (1,134) or treated (43) for the first time. All occurrences got their first treatment by crew between July 1st and August 19th. They were treated a second time when the infestations were visited to monitor cover. All occurrences were monitored between September 2nd and October 21st. Each occurrence visited for monitoring was treated again, if live Harding grass was found. Only one infestation remained incompletely treated: a 0.02 acre occurrence at Dooleyville. Half the infestation was left unsprayed.

Over 28 work days, vegetation management personnel, assisted by volunteers and a Geocorps intern, treated 101.97 gross acres, (3.95 density-adjusted acres), in 821.75 hours (0.12 acres per hour). Monitoring was done in 102.75 hours over 19 days. No time was dedicated exclusively for surveying for new occurrences: all newly mapped occurrences were discovered enroute to known occurrences. 43 new occurrences, 0.39 gross acres, 0.06 density-adjusted acres, were found. A total of 821.75 hours were dedicated to Harding grass work. These hours were time spent in the field, and do not include travel, training or preparation time. On two days we could not treat because wildfire smoke created unhealthy conditions for the crew. One day was lost due to rain. We spent 4 days (89 hours) treating the Heart of Darkness. Much of that time was spent in methodologically gridding the 13 plus acres.

Table 1. Acreage of mapped Harding grass by cover class

Cover Class Range	Number of Polygons	Gross acres	Density-Adjusted acres
0	446	11.72	0.00
1-5%	677	72.47	0.99
6-25%	32	17.37	2.75
26-33%	11	0.13	0.04
34-50%	6	0.01	0.006
51-67%	2	0.27	0.16
68-75%	0	0.00	0.00
76-90%	2	0.004	0.003
91-100%	1	0.002	0.002

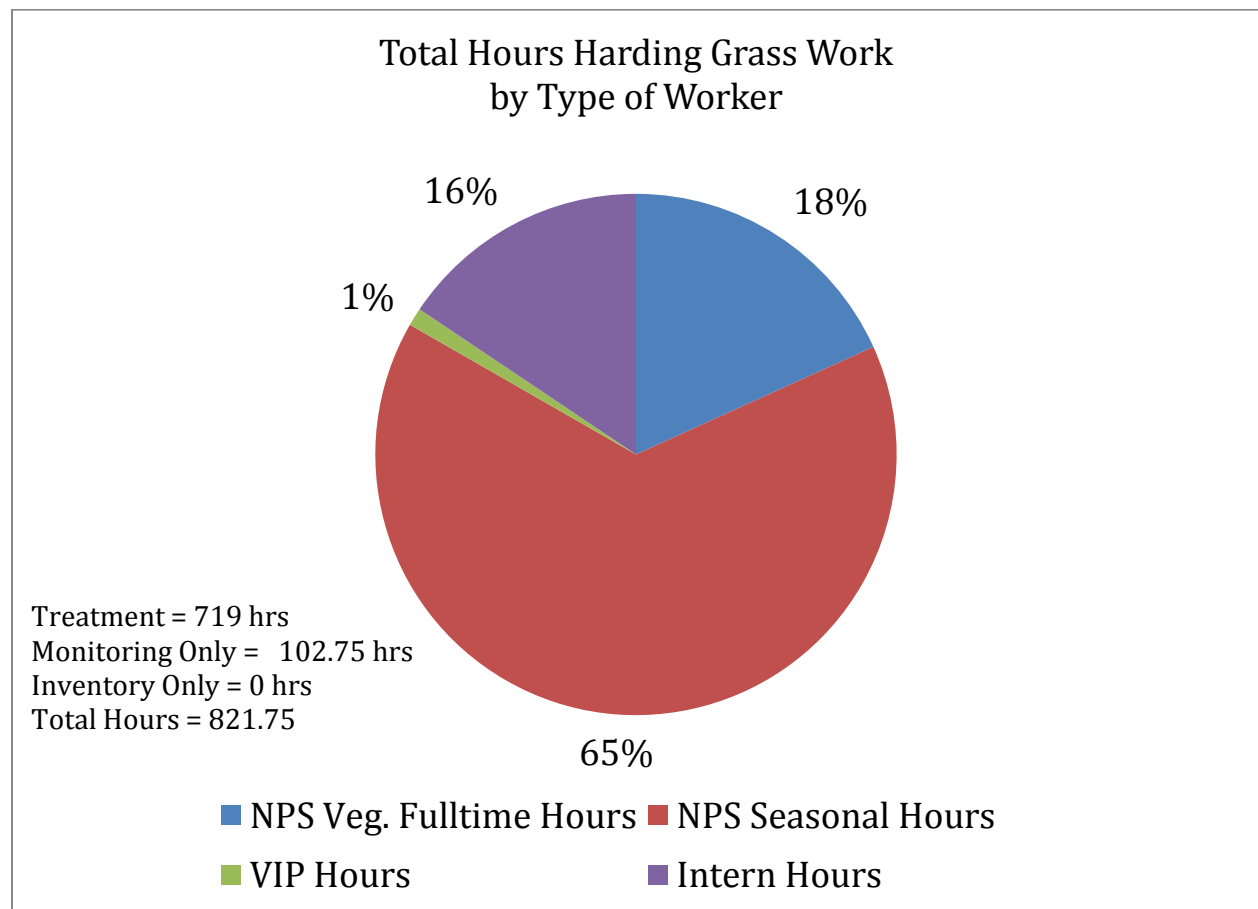


Figure 1. Who did what: the total hours in the field mapping, monitoring and treating Harding grass, by worker type.

Public Volunteer Days

Six events open to public participation were held in 2015. All focused on invasive plant removal: “Westside Ivy Removal,” “Freshwater Beach Iceplant Hunt and Beachgrass Pull,” “Freshwater Beach Ivy Removal,” “Broomin’ at Elk Camp,” “The Eighth Annual Broom Bash in the Bald Hills” and as a participant in California Invasive Species Action Week, an invasive beachgrass removal work day was held at Freshwater Beach . A seventh event, a broom pull open to Rancheria and National Park volunteers, was held at Story Ranch in Crescent City, in partnership with the Elk Valley Rancheria.

Other Invasives Work

Harding grass (*Phalaris aquatica*) is an invasive species of particular concern at Redwood National and State Parks. Growing in the coastal prairies of the Bald Hills, Harding grass has been able to dominate areas of the landscape by forming thick monocultures that exclude all native plants. Treatment of Harding grass in the Bald Hills, using herbicide, began in 2005. All known occurrences have been treated yearly, and documentation of treatment location and date has been recorded. The treatments have been successful. Relative cover has been reduced to less than 5% in all known occurrences. Beginning in 2016, follow up strategy will include yearly visits to all previously treated occurrences, as well as surveys for new occurrences.

GeoCorps Intern Sal Amador took on the task of developing a directed search strategy for *Phalaris aquatica* in the Bald Hills using geospatial data to refine a searches for new Harding grass infestations. Sal worked with Cartographic Technician Josh Van BusKirk to develop a model using physical, hydrological, and vegetative data that exists for the current known locations of Harding grass in the Bald Hills. That model will be used in 2016 to prioritize surveys for Harding grass in the Bald Hills.

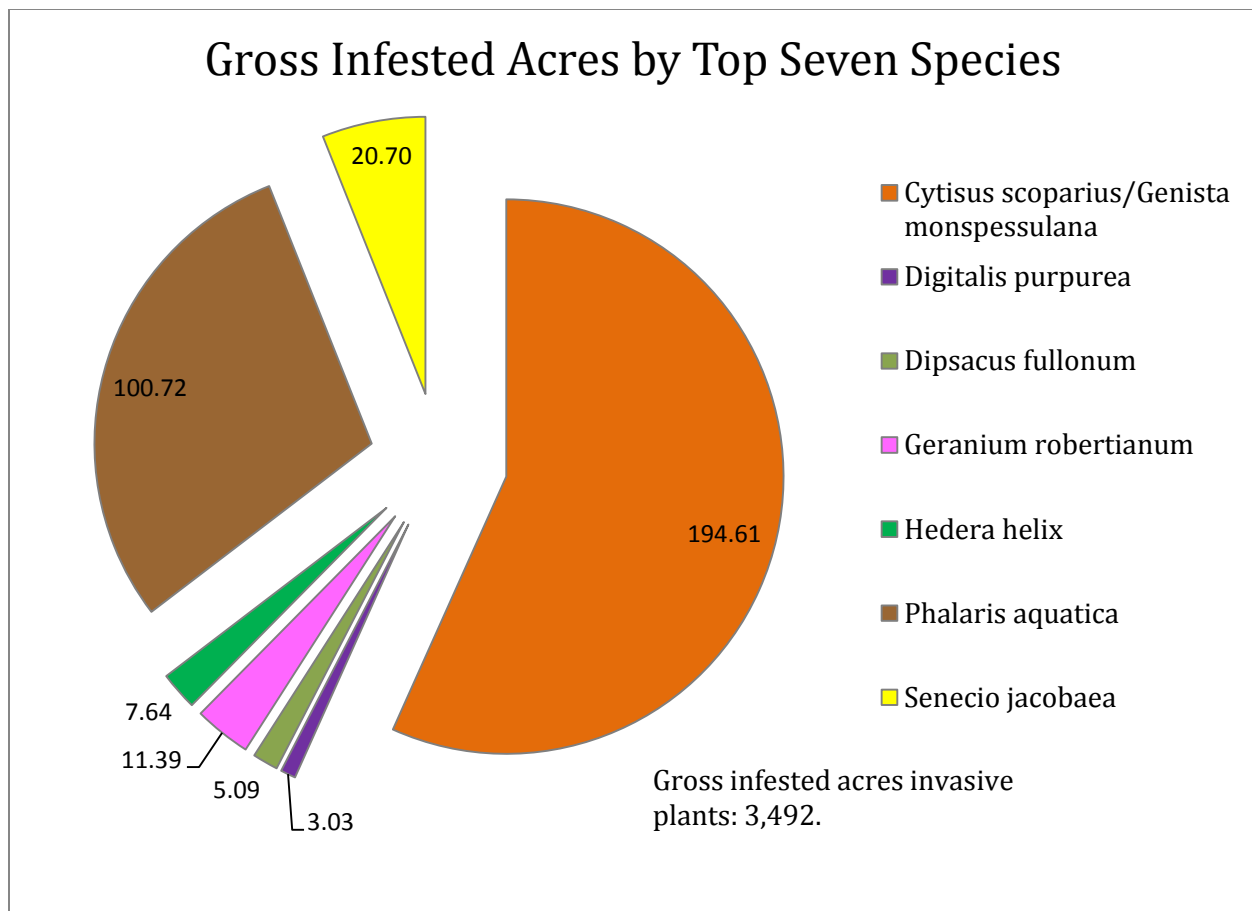


Figure 2. Top seven species treated in 2014 by gross infested acres.

Table 2. Acres, labor type and hours by project.

Project Name	Map-ped Acres	Density Adj. Acres	Total Hours	NPS Veg Full-time Hours	NPS Veg Seasonal Hours	VIP Hrs	HSU Hrs	YPP Hrs
Bald Hills Blackberry	1.90	1.32	29	0	0	20	0	9
Bald Hills Broom	58.16	1.45	383.75	49.5	157.5	60	29.75	87
Bald Hills Canada Thistle	0.23	0.08	8	0	0	0	0	8
Bald Hills Foxglove	3.03	0.09	13.5	0	4.5	0	9	0
Bald Hills Harding Grass	100.73	11.31	1026	253	148.5	13	431	190.5
Bald Hills Ivy	0.16	0.06	19	2	0	8	0	9
Bald Hills Klamath Weed	0.01	0.00	0.5	0	0	0	0	0.5
Bald Hills Stinky Bob	1.35	0.01	25	5	3	1	10	6
Bald Hills Teasel	1.02	0.02	9	0	1.5	0	0	7.5
Bald Hills Yellow Star Thistle	0.04	0.00	5	0	0	2.5	0	2.5
Bald Hills Three-cornered Leek	0.12	0.09	3	3	0	0	0	0
Bald Hills Yellow Star Thistle	0.01	0.000	2	0	0	1	0	1
Trillium Falls Ivy	25.58	0.000	2	0	0	2	0	0
Berry Glen Stinky Bob	0.01	0.0002	0.75	0	0.75	0	0	0
CBEC Tansy	4.89	0.05	2	0	1	0	0	1
Bypass Shining Geranium	0.18	0.07	6.75	0	4.5	2.25	0	0
Crescent Beach Shining Geranium	1.37	0.06	5	5	0	0	0	0
Crescent Beach Tansy	0.26	0.01	7	0	4.5	2.25	0	0
Davison Three-cornered Leek	0.001	0.0004	1	1	0	0	0	0
Enderts Fennel	0.003	0.001	3	3	0	0	0	0
Enderts Three-cornered Leek	0.005	0.004	1	1	0	0	0	0
Freshwater Beachgrass	1.15	0.14	243	16.5	19	149.5	32	26
Freshwater	0.29	0.00	15	0	2	4	0	9

Fennel								
Project Name	Map-ped Acres	Density Adj. Acres	Total Hours	NPS Veg Full-time Hours	NPS Veg Seasonal Hours	VIP Hrs	HSU Hrs	YPP Hrs
Freshwater Jubata Grass	0.02	0.01	0.5	0	0.5	0	0	0
Freshwater Sea Fig	0.08	0.003	6	3	0	3	0	0
By-Pass North Shining Geranium	0.18	0.07	6.75	0	4.5	2.25	0	0
Headquarters Shining Geranium	0.01	0.01	0.25	0.25	0	0	0	0
Hiouchi Broom	0.27	0.11	2	0	2	0	0	0
Hiouchi Giant Knotweed	0.53	0.01	0.5	0.5	0	0	0	0
Jed Broom	105.34	6.59	117	5.5	10.5	77	6	18
Jed Ivy	6.86	0.33	28	4	4	20	0	0
Lagoon Creek Fennel	0.28	0.04	5	0	0	5	0	0
Mill Creek Property Shining Geranium	0.03	0.01	11.5	10.5	0	0	0	1
NOC Broom	30.50	0.30	17.5	8.5	9	0	0	0
NOC Tansy	15.54	0.47	3	0	1.5	0	0	1.5
Tall Trees Teasel	4.07	0.04	1	0	0	0	0	1
Prairie Creek Stinky Bob	10.04	0.07	1	0	1	0	0	0
Westside Broom	0.32	0.13	38	0	17	1	20	0
Wilson Creek Fennel	0.002	0.00	14	0	10	4	0	0
Wilson Creek Ivy	0.62	0.29	16	0	8	8	0	0

Table 3. Acres, labor type and hours by species.

Taxonomy	Map- ped Acres	Density Adj. Acres	Total Hours	NPS Veg Full-time Hours	NPS Veg Seasonal Hours	VIP Hrs	HSU Hrs	YPP Hrs
<i>Allium triquetum</i>	0.13	0.09	1	1	0	0	0	0
<i>Ammophila arenaria</i>	1.15	0.14	243	16.5	19	149.5	32	26
<i>Carpobrotus chilensis</i>	0.08	0.003	6	3	0	3	0	0
<i>Centaurea solstitialis</i>	0.01	0.00	5	0	0	2.5	0	2.5
<i>Cirsium arvense</i>	0.23	0.08	8	0	0	0	0	8
<i>Cortaderia jubata</i>	0.02	0.01	0.5	0	0.5	0	0	0
<i>Cytisus scoparius/Genista monspessulana</i>	194.61	8.58	556.25	63.5	194	138	55.75	105
<i>Digitalis purpurea</i>	3.03	0.09	13.5	0	4.5	0	9	0
<i>Dipsacus fullonum</i>	5.09	0.06	9	0	1.5	0	0	7.5
<i>Fallopia sachalinensis</i>	0.53	0.01	0.5	0.5	0	0	0	0
<i>Foeniculum vulgare</i>	0.58	0.05	32	3	12	8	0	9
<i>Geranium lucidum</i>	1.59	0.15	23.5	15.75	4.5	2.25	0	1
<i>Geranium robertianum</i>	11.39	0.01	26.75	5	4.75	1	10	6
<i>Hedera helix</i>	7.64	0.69	65	6	12	38	0	9
<i>Hypericum perforatum</i>	0.013	0.003	0.5	0	0	0.5	0	0
<i>Phalaris aquatica</i>	100.72	11.31	1026	253	148.5	13	431	190.5
<i>Polygonum sachalinense</i>	0.53	0.01	0.5	0.5	0	0	0	0
<i>Rubus armeniacus/Rubus laciniatus</i>	1.90	1.32	29	0	0	20	0	9
<i>Senecio jacobaea</i>	20.70	0.52	10	0	6	2.25	0	1.5

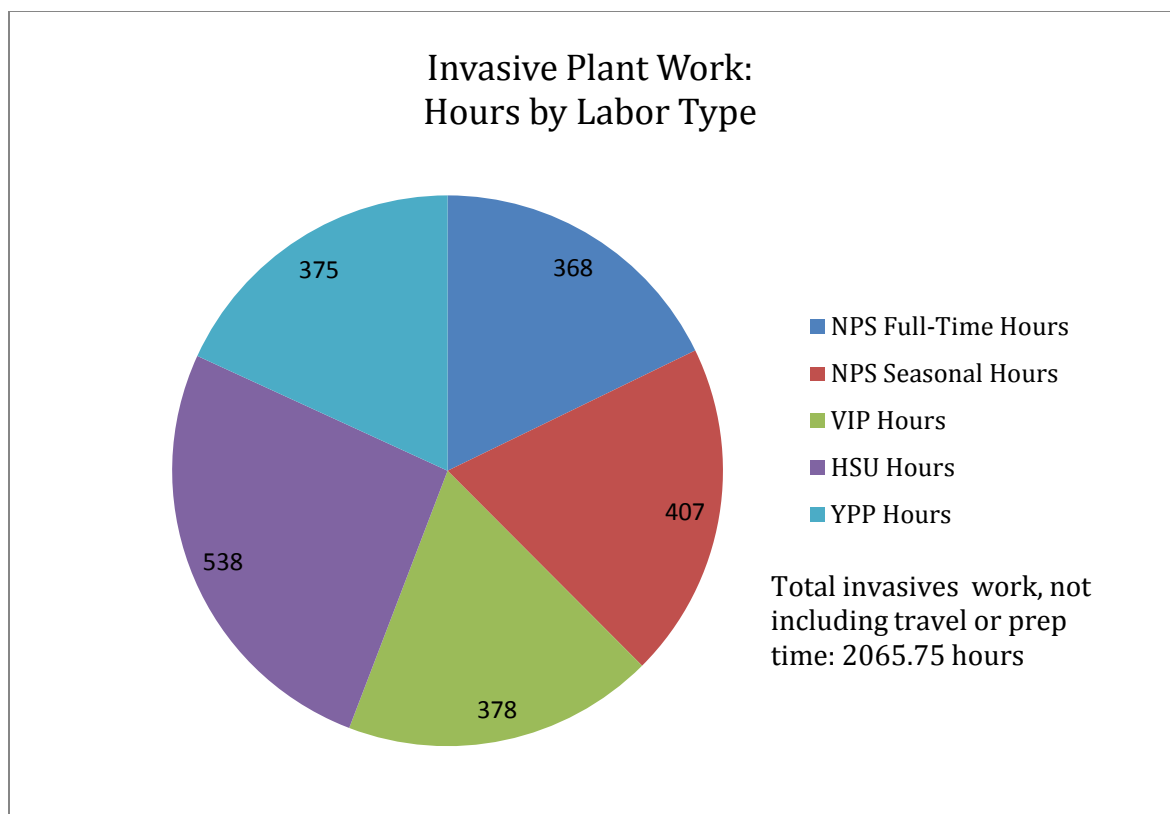


Figure 3. Invasive plant work hours by labor type: NPS full-time employee, NPS seasonal appointment, volunteers (unpaid work), students contracted through Humboldt State University and Youth Partnership Program interns.

2015 Invasives Personnel:

Full-time Invasives Bio-technician: Laura Julian

Seasonal Invasives Bio-technician: Tim Marsh

HSU Spring Interns: Nate Moy, Kelly Pfeiler, Kate MacDonald and Candace Reynolds

NPS Summer Seasonals for Harding grass treatment: Steve Bustamante, Will Pennprase, Audrey Kelly

GeoCorps Intern: Sal Amador

VIP's: Tiffany Van Buskirk, Kellie Eldridge, Brandon Webster, Kim Tays, Stan Binnie, Seher Khan, Nathan Van Sickel and Aaron Goodman.

Volunteer Groups: HSU Natural Resources Club, WALC School and Bishop Paiute Natural Resources School





Figure 4. VIPs, HSU Spring Interns, Geocorps Intern, Vegetation Management Spring and Summer Seasonals, and Park Ecologist, 2015. Not pictured: VIPs Seher Khan, Brandon Webster and Nathan VanSickel: Volunteer groups WALC and Bishop Paiute Natural Resources School. I refuse to put my own picture in- Laura Julian.

Freshwater Beach Iceplant Hunt and Beachgrass Pull

Saturday February 21st. 8:30 am to 3:00pm.

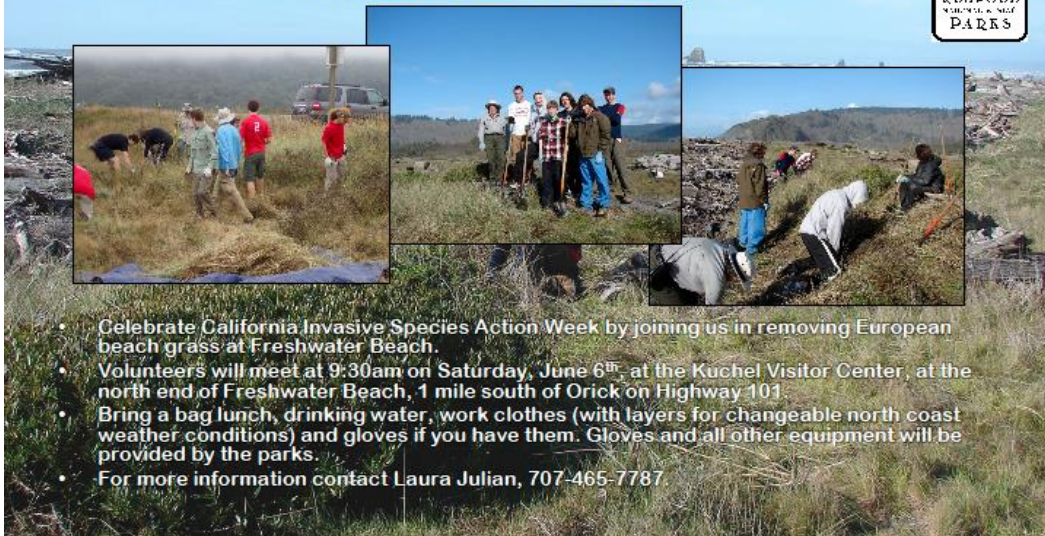
Meet in front of the Kuchel Visitor Center. Dress warmly in layers. Gloves and equipment will be provided. For more information, contact Laura Julian at (707) 465-7787, Laura_Julian@nps.gov



Celebrate California Invasive Species Action Week

Beach Grass Bash

at Freshwater Beach



- Celebrate California Invasive Species Action Week by joining us in removing European beach grass at Freshwater Beach.
- Volunteers will meet at 9:30am on Saturday, June 6th, at the Kuchel Visitor Center, at the north end of Freshwater Beach, 1 mile south of Orick on Highway 101.
- Bring a bag lunch, drinking water, work clothes (with layers for changeable north coast weather conditions) and gloves if you have them. Gloves and all other equipment will be provided by the parks.
- For more information contact Laura Julian, 707-465-7787.



Give the forest a Valentine!

Invasive Ivy Pull **Redwood National and State Parks** **Saturday February 14th**

8:00am to 3:00pm

Help remove invasive English Ivy from the spruce forest
above Freshwater Lagoon

Meet at 8:00 am in front of South Operations Center

Gloves and tools will be provided. Dress warmly, in layers.

Don't forget to bring water and a lunch.

For more information, contact Laura Julian at:

707-465-7787 or Laura_Julian@nps.gov



Invasive Ivy Pull **Redwood National and State Parks** **Saturday February 28th**

8:30am to 3:00pm

Help remove invasive English Ivy at Freshwater Lagoon

Meet at 8:30 am in front of Kuchel Center

Gloves and tools will be provided. Dress warmly, in layers, and
bring water and a lunch.

Rain doesn't cancel, but wind does!

For more information, contact Laura Julian at:

707-465-7787 or Laura_Julian@nps.gov

Invasive Scotch Broom Removal

Redwood National and State Parks

Saturday March 7th

8:30am to 3:00pm

Help remove invasive broom
at Elk Camp Prairie in the Bald Hills

Meet at 8:30 am in front of South Operations Center
We will carpool to Elk Camp Prairie on Bald Hills Road
or meet us at the prairie at 9:30 am

Gloves and tools will be provided. Dress warmly, in layers, and
bring water and a lunch. For more information, contact
Laura Julian at: 707-465-7787 or Laura_Julian@nps.gov

Eighth Annual

Broom Bash in the Bald Hills



Become a steward of your National and State Parks and join us for the Eighth Annual Scotch Broom Bash in the Bald Hills.

Volunteers will meet at 9:00am on Saturday, March 25th, at the Kuchel Visitor Center, at the north end of Freshwater Beach, 1 mile south of Orick on Highway 101.

Bring a bag lunch, drinking water, work clothes (with layers for changeable north coast weather conditions) and gloves if you have them. Gloves and all other equipment will be provided by the parks.

For more information contact Jim Wheeler, 707-465-7764 or Laura Julian, 707-465-7787.



Figure 5. Flyers sent out to advertise volunteer work days in the park in 2015.