

HydroMechanical Obliteration (H_M_Osm) in the Golden Gate National Recreation Area

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Abstract

We are reporting on the use of a new control technique: Hydro-Mechanical Obliteration (H_M_Osm), on six invasive plant species in Marin County, California at the Golden Gate National Recreation Area (GGNRA). Data collection consisted of a combination of before and after plots while others were recorded with photo-documentation. H_M_O involves the use of small amounts of water at 3500-7000 PSI to remove woody and herbaceous perennial plants. The result is a leave-in-place mulch with herbaceous plants or in the case of French Broom (*Genista monspessulana*) mature plants were removed and piled. For Cape-ivy (*Delairea odorata*) and English ivy (*Hedera sp.*) significant reductions in both species were achieved with a single treatment. For Hardwing grass (*Phalaris aquatica*) multiple treatments over time were required. We had great success with Cape-ivy and panic veldt grass (*Ehrharta erecta*) control as a follow-up to our initial mechanical removal of Cape-ivy conducted two years previously. On jubata grass (*Cortaderia jubata*) only small plants were removed with one treatment, larger plants have taken 3-4 treatments over 12 months and French broom (*Genista monspessulana*) growing among compacted rock along Bolinas Lagoon removal was also successful. We found H_M_O to be a beneficial and cost-effective addition to our IPM toolbox.

Method and Materials

Hydro-Mechanical Obliterationsm uses low volume water at very high pressure to micro-minimize vegetative matter in-situ.

H_M_Osm is a highly targetable growth control process. It works well on reducing light weedy vegetation and frustrating plant growth.

Woody materials are subjected to three possible scenarios:
 • controlled defoliation of green vegetation and dead biomass and around the living plant to reduce fuel.
 • removing plant by root via liquefaction.
 • or girdling the plant by killing by removing outer bark around the tree/plant.

Since all materials are left in place the nutrients are recycled back to the soil in which they came.

The H_M_O application works in any interface, urban weed control, wild land, and water.

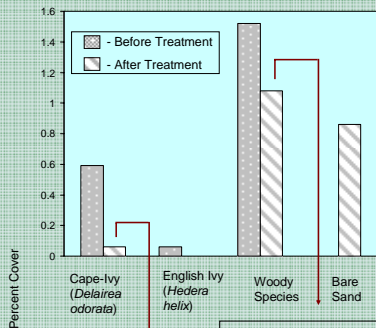


Case Study: Cape-ivy removal at Stinson Beach

Objective: Determine the effectiveness of H_M_O to control Cape-ivy in sandy soil.

Methods: Sampling: Point-intercept sampling of vegetation cover was collected before treatment and six weeks after treatment. 30 points in a 9 x 10 meter square.

Treatment: The plot was entirely cleared of visible Cape-ivy using the H_M_O technique and 150 gallons of water. No limbing of willows occurred.



Result: H_M_O significantly decreases Cape-ivy and English-ivy cover without removing canopy species.

Results of Additional Applications

H_M_O has been used as an invasive plant removal technique in the GGNRA on French broom (*Genista monspessulana*), Hardwing Grass (*Phalaris aquatica*), Panic Veldt Grass (*Ehrharta erecta*), Jubata (*Cortaderia jubata*) and Fennel (*Foeniculum vulgare*).

FRENCH BROOM:

H_M_O was able to rapidly cut plants at the soil level and be collected into piles.



Before

After

HARDING GRASS:

Four treatments of H_M_O applied over 18 months resulted in 100% reduction in seed head production.



Before

After

JUBATA:

50% of the smaller plants were removed after one treatment; larger plants needed three to four treatments over 12 months.



Before

After

FENNEL:

One treatment was able to successfully remove all but two fennel plants. Only small portions of those two plants remained and there was no need to retreat the sites:



Before

After

H_M_O was used successfully as a follow-up to a prior mechanical removal for Cape-ivy and panic veldt grass.

Advantages of H_M_O

•FAST:

- Time spent hauling herbaceous biomass from site is eliminated.
- "Bare Ground" initial treatments for species like cape-ivy are completed in significantly less time than traditional manual methods.
- One applicator can obliterate one quarter to one acre of vegetation in one day (depending on species type).

•CLEAN:

- Eliminates the exposure to Herbicides and other Chemicals, especially when removing aggressive plants.
- Avoids use of engine driven cutters which pollute and can cause fires.
- Can be used with reclaimed water

•MINIMALLY DISRUPTIVE:

- Does not cause erosion
- Recycles nutrients from the obliterated vegetation back to the soil.
- Allows the applicator to be incredibly specific in obliterating the target species
- Leaves canopy layer undisturbed.

OTHER BENEFITS

- Systems can be mobilized for certain applications where access and target species are deep in impassable vegetation.
- Systems are built to suit a wide range of tasks.

Limitations

•REVISITATION

- Hydro-Mechanical Obliteration often requires multiple treatments, especially when removing aggressive plants.
- It can unintentionally ginle trees and shrubs when used sub-soil.

•PROXIMITY

- Systems are limited by hose: 400 feet max line.

•TRAINING

- Applicators must be trained and maintain certification.

Future Studies

To better understand the capabilities and limitations of H_M_O more studies must be performed investigating:

- Long term invasive control
- Seed mortality/obliteration
- Seasonality considerations and constrictions
- Effectiveness on other invasive species

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