

## Phragmites Control for Homeowners and Land Stewards

2015



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It Blocks Views

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## Fire Hazard



- Reduces property values & tourism
- Limits access for recreation
- Damages valuable landscaping

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Reduces native plant and animal habitat,  
population and diversity

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- Dries out wetlands
- Fills in canals, rivers and streams
  - Clogs water intakes
- Navigation hazard on roads and waterways
  - Hinders search and rescue operations

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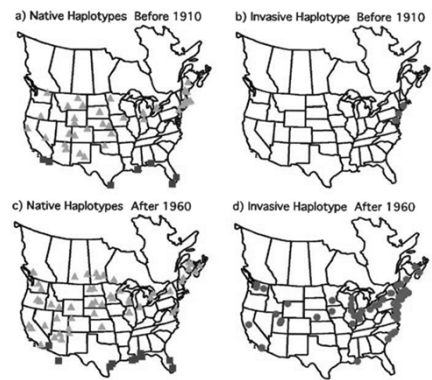
## Where did this Phragmites come from?



Early 1800's trade with Europe

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## When did it become a problem?



We know it was a problem on Staten Island in 1972

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Where does it grow?

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Not just in wet areas

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## Small Scale vs. Large Scale Projects

### Homeowners

- Small Sites
- Limited Resources
- Do the work themselves
  - Want fast results
  - Want complete removal
- Focus on the details

### Conservation Agencies

- Large Sites
- Short term funding
- Hire Contractors
- Responsible to provide the greatest service for the \$.
- Looks at the big picture

Different goals.  
All of these factors can affect your approach to the problem.

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## Results

### Homeowners

- 99 - 100% control
- Invested continued control

### Conservation Agencies

- 90 - 95% control
- Control while funding is available

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## How does it spread?



by seed and rhizome

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## It is persistent and quickly takes over



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## Parking lot 2012



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## Parking lot 2013



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Pond 2011



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Pond 2015



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### What can we do to control Phragmites?

- Prevention  
Clean equipment being brought onsite
- Early Detection  
Know how to ID Phragmites
- Rapid Response  
Start controlling it the first season it is found

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### Can I dig it out?



Digging, tilling, pulling will help it spread

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### One Exception to not pulling it out



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### Can I cut it or burn it?

Cutting or Burning alone usually encourages growth

Cutting every two weeks for years may set back a small stand alone patch

Goats and sheep have been used to graze areas infested with Phragmites. They will eat it, but, it will just keep growing back.



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Exception – cut below the water line



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Later in the season



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What does control it?

Landscape fabric not compatible to supporting other plants.  
The roots may spread outside of the covered area.

Cornell University biological control.

<http://acwc.sdp.sirsi.net/client/search/asset/1035680>.

USGS testing for endophyte disruption and gene silencing.

**Flooding, cutting and burning in combination  
with multi-year herbicide applications can  
control Phragmites.**

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The best Phragmites control  
**WITHOUT USING HERBICIDES**  
is achieved by drowning the plant by  
repeated cutting of the stems below the  
waterline.

It is best to cut it when the phragmites reaches four feet or  
more above the waterline.

Cut the stems as low as possible below the waterline.

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The best Phragmites control  
**WITHOUT FLOODING**  
or cutting below the waterline is  
achieved with a multi-year plan of  
cutting and/or burning in  
combination with herbicide and  
surfactant applied Mid-August  
through September.

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How can we get the herbicide into the plant?

Foliar spraying

Cut and dab

Glove of death

Wipe-It

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## Wipe-it Tool



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## Why cut or burn along with the herbicide?



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- Stresses the plant
- Allows soil exposure and blackening to encourage native seed bank germination
- Allows chemicals to reach the live plant surfaces easier
- Allows better human access

## Don't waste chemicals on last year's phragmites



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## Not Pre-cut



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## Pre-cut



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## When best to cut or burn

- November to May
- Not within two weeks following the herbicide treatment
- If cutting with riding equipment the best time to cut to avoid soil disturbance is when the ground is frozen, late January.



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## My biggest mistake in 10 years of Phragmites Control

*Not pre-cutting before the first season of treatment*

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### Cutting Recommendations

- No lower than 4" from ground or water.
- 6" min. where native plants are present.
- Up to 12" where there are tall native plants.

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### Field notes from cutting dense dead Phragmites with a tractor/brush hog

- Make sure you are in 4-wheel drive.
- Keep the cutting blades high.
- Make sure your coolant is topped off.
- The seeds will clog the air intake grilles and screens. In warm weather watch your temperature gage and stop on occasion to clear the seeds and let the engine run 1/3 speed to cool off.
- When done, clear all seeds from motor area with an air compressor.
- If you have a front end bucket in winter you can use it to scrape the Phragmites off clean to the ice.

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### What do I do with the cuttings

- Burn them standing in place (only by professionals)
- Burn them in place, but mowed down first, with firebreaks
- Burn them after mowing and moved to piles or rows
- Roll down and leave in place
- Mow down and leave in place
- Mow down and move to degraded areas or trails. Check with DEQ to assure you are not violating wetland laws. Do not move cuttings to or through un-infested areas.
- Mow down and remove from the site in bulk
- Hand cut and bag them for removal with trash
- Hand cut and bag the heads only and remove with trash

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### Getting started

- Make sure you can Identify Phragmites and distinguish it from other plants

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### Phragmites



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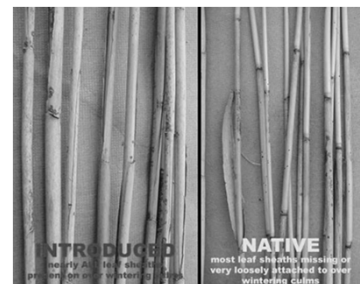
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### Native vs. Non-native Phragmites

Make sure you can ID Native Phragmites

see  
YouTube.com  
"Video 9 –  
Phragmites"  
By Kristy Beyer



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## Collect Information and Make a Plan

- Goals
- Resources – financial & manpower
- Procedures
- Timing
- Equipment needed
- Supplies needed
- Monitoring progress

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## Equipment

( Do not use any metal tank equipment )



Backpack sprayer

Handheld sprayer

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ATV Mounted  
Sprayer

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Gas Powered Pump Sprayer

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Gas Powered Pump Sprayer

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### Equipment for cutting in wet areas



Marshmaster  
www.GreatLakesPhragmitesCutter.com

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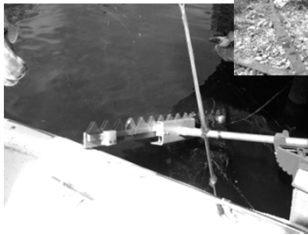
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### Equipment for cutting over water



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### Equipment for cutting under water



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### Chemical Definitions

**“PESTICIDE”** - A chemical preparation for destroying plant, fungal, or animal pests

**“HERBICIDE”** - A substance or preparation for killing plants, especially weeds. An “Herbicide” is a type of “Pesticide.”

**“SURFACTANT”** - A chemical agent capable of reducing the surface tension of a liquid in which it is dissolved [wetting agent]

**“A.I.”** – The percentage of **“Active Ingredient”** in the bottle

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### The Chemicals

On dry land above the ordinary high water mark you can usually use

#### **Round-Up**

(herbicide and surfactant mix) (Check your State regulations.)

Anywhere near water you should only use

**DEQ approved Glyphosate and surfactant**

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### The Mix

- Herbicide
- Surfactant
- Water
- Sometimes Water Conditioner
- Dye (optional)

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### Why mix my own chemicals?

- Aquatic formulas are not available pre-mixed ready to use out of the bottle
- You can mix your own herbicide comparable to RoundUP for about 1/5 the cost.

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### Do homeowners and volunteers at nature centers need to be certified to mix and apply herbicides?

Usually No. People can mix “general use” herbicide products themselves and they can apply them themselves if in compliance with the label requirements, including the use of personal protective equipment and disposal, and they are not doing it for commercial purposes and not in the course of employment.

(Check with your local DEQ or Department of Agriculture.)

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### Aquatic Herbicides

- EPA Labeled “CAUTION” as opposed to “WARNING” or “DANGER”
  - “General Use Pesticides”  
Not classified by the EPA as Restricted Use.
  - “Systemic”  
Taken into the plant and translocated to the roots
  - “Non-selective” or “Broad-spectrum”  
Will kill most other plants it contacts

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### Phragmites Herbicides

- Imazapyr
  - Can be applied in the fall and/or in the summer
  - Has a little better control rate than Glyphosate
  - Costs about seven times as much as Glyphosate
  - *Habitat*
- Glyphosate
  - Apply to Phragmites only in the fall
  - *Accord, Aquamaster, Aquaneat, AquaPro, AquaStar, Eagle, Glyfos, Glypro, Rodeo, Shoreklear*

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### Phragmites Herbicides - Toxicity

**Comparative Oral Toxicity of Aquatic Herbicides and Common Household Products**  
*David G. Perry, NDR Research*

Product	Oral LD <sub>50</sub> (mg/kg)	Usage	Product	Oral LD <sub>50</sub> (mg/kg)	Usage
Nicotine	50	Personal choice	Vitamin C	2,000	Vitamin
Caffeine	140	Personal choice	Topramezone	>2,000	Herbicide
Hot sauce (capsaicin)	161	Food seasoning	Table Salt	3,000	Food seasoning
Bleach (sodium hypochlorite)	192	Household cleaner	2,4-D	3,129	Herbicide
Aspirin	200	Medication	Vinegar (Acetic Acid)	3,310	Food seasoning, household cleaner
Endothall	233	Herbicide	Bispyribac-sodium	4,077	Herbicide
Naproxen sodium	248	Medication	Carfentrazone	>5,000	Herbicide
Cinnamon	275	Food seasoning	Flumioxazin	>5,000	Herbicide
Diphenhydramine HCl	500	Antihistamine	Fluridone	>5,000	Herbicide
Diquat	866	Herbicide	Glyphosate	>5,000	Herbicide
Pink bismuth (bismuth subsalicylate)	1,200	Medication	Imazamox	>5,000	Herbicide
Vitamin A	1,510	Vitamin	Imazapyr	>5,000	Herbicide
Triclopyr	1847	Herbicide	Nail Polish Remover	>5,000	Beauty product
Acetaminophen	1944	Medication	Penoxsulam	>5,000	Herbicide

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### Surfactants

- Enhance spreading, sticking and wetting properties of the herbicide. Break down the waxy surface coating on plants.
- *Cygnat Plus*

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### Water carries the herbicide to the plant cells

- Over 98% of your mix will be water
- Glyphosate is a mild acid
  - In water it can split into pieces and connect to other larger molecules
  - The parts not split are more readily absorbed by the plants
  - Hard water or dirty water can split the Glyphosate

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### Desirable Water Qualities

- Clean, clear and free of organic materials
- Low mineral content (soft water)
- Slightly acidic (pH from 3 to 6)

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### Water Conditioner

- Lowers pH
- Do not use if treating under DEQ permit
- I prefer *AquaBupH* liquid water conditioner
  - Use 1/2 oz. per gallon

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### Preferred Water

- Distilled water
- Soft water
- Municipal water
- Clean clear lake water
- Clean clear rain water.
- Not well water or pond water

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### Application Rates

- Maximum amount allowed per treatment are
  - Glyphosate – 6 pints per acre
  - Cygnet Plus – 1 pint per acre
  - Water Conditioner – not specified
- Low Volume sprayer mix recommendations from the USFWS, MDEQ, MDNR document “*A Guide to the Control and Management of Invasive Phragmites*”
  - 1 to 1.5% solution of a 53.8% A.I. Glyphosate product.  
(2 oz. per gallon = 0.84% A.I.) ( $2/128 \times 0.538 = 0.0084$ )
  - Use a state-approved nonionic surfactant at a rate recommended on the label. (The label states 1 pint to 2 quarts per acre)
  - There is no mention of using a water conditioner

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### Mixing one gallon of low volume sprayer mix

(Assuming you will only be treating once during the season)

- Start with about 3/4 of the water (96 oz.)
- If using a water conditioner add 1/2 oz. per gallon here – mix it
- Add Herbicide – 53.8 % Glyphosate ( **2 oz.=.085% A.I.**) – mix it
- Add Surfactant - Cygnet Plus ( 1/6 oz.) – mix it
- Top it off with water to 128 oz. total – mix it
- Add Dye (optional) – Cygnet Select (1/6 oz.) – mix it

The maximum application rate of 6 pints of glyphosate per acre would be comparable to spraying 900 square feet (about 30' x 30' area) with one gallon of the above mix

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## My second biggest mistake in 10 years of Phragmites Control

*Not applying multiple  
treatments in the first year*

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## Retreatment

- The maximum herbicide quantities to be used that are given on the label are “per treatment”
- DEQ permits sometimes state that there shall be a minimum of 24 hours between treatments.
- I have obtained the best results by mixing the herbicide at a lower a.i. rate and retreating at two week intervals any **remaining green phragmites**.
- Not retreating the surviving phragmites is like not taking all of your antibiotic prescription. The strong ones survive to reproduce next year.

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## Samples of Phragmites Needing Retreatment



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## Samples of Phragmites Needing Retreatment



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## Samples of Phragmites Needing Retreatment



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## Samples of Phragmites Needing Retreatment



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### The WIPEOUT program

Williams Invasive Phragmites Eradication OUTline

(short term, labor intensive, maximum control)

- Prior to June – Pre-cut
- August 15 - treat
- September 1, 15 & 30 – retreat any green phragmites
- October 15 – Post-cut

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### Mixing one gallon of low volume mix under the WIPEOUT program

- Start with about 3/4 of the water (96 oz.)
- If using a water conditioner add ½ oz. per gallon here – mix it
- Add Herbicide – 53.8% Glyphosate (**1 oz.=0.42% A.I.**) – mix it
- Add Surfactant - Cygnet Plus (1/2 oz.) – mix it
- Top it off with water to 128 oz. total – mix it
- Optionally add Dye – Cygnet Select (1/6 oz.) – mix it

The maximum application rate of 6 pints of glyphosate per acre would be comparable to spraying 450 square feet (about 21' x 21' area) with one gallon of the above mix

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### Different A.I.'s for Different Treatment Methods

(followed by ounces of 53.8% product per gallon of mix)

Foliar spraying – 0.42% to .85% A.I. (1 oz. – 2 oz.)

Glove of death – 2.5 to 5% A.I. (6 oz. – 12 oz.)

Wipe-It – 2.5 to 5% A.I. (6 oz. – 12 oz.)

Cut and dab or injection – 15% to 25% A.I. (36 oz.– 60 oz.)  
(which equals 4.5 oz. – 7.5 oz. per pint of mix)

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### Chemical Availability & Costs

- HERBICIDE - Glyphosate (53.8% a.i.)
  - 2.5 gallons, \$100
  - *Shoreklear*, 1 quart, \$50
- SURFACTANT - *Cygnet Plus*
  - 1 gallon, \$25
- WATER CONDITIONER - *AquaBupH*
  - 2.5 gallons, \$70
- DYE - *Cygnet Select*
  - 1 gallon, \$25
- OPTION - *Shoreklear Plus*, Glyphosate (18% a.i.) plus surfactant
  - 1 gallon, \$60
  - However, you are paying about 2.5 times as much for the A.I. for the convenience of being able to have the surfactant included.

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### Minimum Purchase Option to make low volume sprayer mix

- 1 gallon of *Shoreklear plus* = \$60 + s&h
- Skip the water conditioner, skip the dye
- For \$80 you can treat about 1/3 acre.
- \$240 per acre per treatment

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### Larger, More Economical Purchase Option to make low volume sprayer mix

- 2.5 gallons of *AquaPro* (53.8% a.i.) = \$100 + s&h
- 1 gallon of *Cygnet Plus* = \$25 + s&h
- 2.5 gallons of *AquabupH* = \$65 + s&h
- 1 gallon of *Cygnet Select* = \$25 + s&h
- For \$250 you can make enough mix to spray over 3 acres with water conditioner and dye and have some *AquaPro*, *AquabupH* and *Cygnet Select* left over.
- \$75 per acre per treatment
- w/o water cond. or dye \$50 per acre per treatment
- Unused Glyphosate can be stored for up to 5 years

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### My Preferences

*Cygnat Plus*  
2.5 gallon



*AquaPro*  
2.5 gallon

From Cygnat Enterprises in Flint, MI  
1-800-359-7531 – Joe Bondra

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### When to Treat

- In Southern Great Lakes Region -  
Mid-August to end of September
- Not after the first killing frost
- Not within 4 weeks of the last cutting or burning

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### Before Treatment Day

- Check the weather reports
- Post signs as required by permits
- If spraying over water close down  
potable water intakes within ½ mile
- Review your plan
- Reread the chemical labels

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### Treatment Day

- Not too windy, unless you want the wind to carry the herbicide into  
a deep stand
- Not expecting rain – needs 6 hours set time
- Sunny – Increases absorption
- Spray the leaves and stems to coverage without drip off
- If possible spray while walking backwards
- Try to use all of the mix that day or soon after
- Clean all equipment and save rinsate for next time

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### Record Keeping

- Date, time, weather
- Person doing the treatment
- Location and area treated
- Chemicals and source of water
- Rates of mix
- Equipment used
- Comments
- Observations later in the month
- Photos

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### After Treatment Day

- Do not re-enter the area or swim there for 24 hours
- Potable water intakes within ½ mile should remain  
closed 48 hours
- Be patient – Don't expect plant discoloration  
symptoms for two weeks or more
- Don't cut or burn for two weeks

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### Herbicide Safety

- Glyphosate products are labeled “Caution”
- Follow all instructions on the labels
- Use proper procedures
- Use recommended safety equipment

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### Safety Equipment

- PPE as specified on the label
  - Personal Protection Equipment
  - Equipment recommended for the person using the diluted mixed solution.
- Additional protection recommended
  - More stringent for persons handling the concentrates and doing the mixing.

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### Diluted Glyphosate Applicator PPE

- Dedicated clothing
- Long Sleeves, Long Pants
- Closed Shoes, Socks
- Gloves, Hat

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### Glyphosate Mixer Protection

- Dedicated Clothing
- Long Sleeves, Long Pants
- Closed Shoes, Socks
- Nitrile Gloves
- Nitrile Apron
- Goggles or Face Shield

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Measuring Cups

Dedicated Location  
& Pesticide Spill Kit

Funnels



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Emergency Information

Secondary Containment Buckets  
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Locked Storage Cabinet

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Measuring Bottles  
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Spill Containment Pan

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## Abbreviated Herbicide Safety Procedures

- After working with chemicals
  - Wash hands thoroughly before eating, drinking, using tobacco products or going to the bathroom.
  - If possible wash gloves and footwear with detergent and water before removing them.
  - Change clothes and take a shower at the end of the workday.
  - Do not wash those clothes with the family laundry.
- Read all labels for specific instructions.

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## Additional Pesticide Safety Tips

- Always read the label before buying or using pesticides. Use pesticides only for the purpose(s) listed and in the manner directed.
- Do not apply more than the amount of pesticide specified in the permit. Overdoses may harm you and the environment, and will likely not result in better control of the nuisance.
- Keep pesticides away from food and dishes.
- Keep children and pets away from pesticides and treated area.
- Do not smoke while spraying.
- Avoid inhalation of pesticides.
- Never spray outdoors on a windy day.
- Pesticides that require special protective clothing or equipment should be used only by trained, experienced applicators.

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## Additional Pesticide Safety Tips - Continued

- Avoid splashing if you mix pesticides.
- Avoid breaks or spills of pesticide containers.
- If you spill a pesticide on your skin or on your clothing, wash with soap and water and change your clothing immediately.
- Store pesticides under lock in the original containers with proper labels. Never transfer a pesticide to a container, such as a soft drink bottle, that would attract children.
- Refer to the pesticide label for proper disposal methods.
- Wash with soap and water after using pesticides, and launder your clothes before wearing them again.
- If a pesticide is swallowed, check the label for first aid. Call or go to the doctor or the hospital immediately and take the pesticide label with you.

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## Permits

- To Remove
- To Burn
- To Cut
- To Herbicide

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### Permits to Remove Phragmites

Do not attempt to  
remove, dig, till or pull  
Phragmites.

It doesn't do anything except spread them.

It is not allowed under any permit as a method of controlling  
Phragmites

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### Permits to Burn Phragmites

Local Fire Department

(Hire a prescribed burn contractor)

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### Permits to Cut Phragmites Many State DEQs

If between the OHWM and the water's edge a  
permit to cut may be required.

For any phragmites in standing water a permit may be required.

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### Permit to herbicide Phragmites U.S. Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES)

Only required for large control projects.

May be issued through your local or State DEQ.  
Contact them.

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### Permit to herbicide Phragmites State DEQ

**MAY NOT BE REQUIRED**

Above the Ordinary High Water Mark (OHWM) or  
On small ponds with no outlet.

**IN ONTARIO HERBICIDES CANNOT  
BE USED AROUND WATER.**

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### Hiring a Contractor

- If spraying below the Ordinary High Water Mark (OHWM) they need to have
  - Pesticide Application Business License
  - Aquatic Pest Management certification for spraying in wet areas
  - Right-of-Way certification for spraying in dry areas
- For a list of approved contractors contact your state Department of Agriculture.

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### Clay Township Phragmites Management Plan

- Adopted June 7, 2010
- Includes
  - Surveying the infestations – using GIS
  - Establishing priority treatment areas
  - Communicating with and educating property owners
  - Assisting with permits and treatment
  - Making chemicals and equipment easily available
  - Exploring funding
  - Creating a coordinator and a volunteer organization

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### Clay Township Permits Procedure

- Property owners apply to be in the program
- The Township applies to the State for a permit
- Applicants attend a Phragmites Management Workshop
- The Township receives permits from the State
- The Township issues individual approvals to proceed along with the needed posting signs and treatment report forms
- The property owner completes the treatment and files a treatment report with the Township.
- The Township files a treatment report with the State.

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### Clay Township Herbicide Distribution

- Property owners apply to be in the program
- Participants attend a Phragmites Management Workshop
- Participants order chemicals from the Township
- Purchasers can pick up herbicides from the Township

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### Clay Township assistance with Contractor Procurement

- The Township obtains a list of contractors certified by the State of Michigan to control Phragmites.
- The Township prepares a list of recommended contractors based on certification, experience with Phragmites control and interest in working in this area.
- The list is made available to all property owners.
- The Township obtains the necessary permits and files the required reports following treatment, thereby reducing the amount of work needed by the contractors.

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### View Enhancement



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### Recreational Access



before

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after

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## Fire Safety



before

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after

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Spring 2012



Fall 2013 before treatment



Fall 2013 after treatment



Fall 2014

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## Ecosystem Restoration



After winter cutting & before first treatment

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After fall treatment and winter cutting

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After dredging

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2 years later

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Natural regrowth

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### Long Range planning

- Fall herbicide treatment for three years in a row with annual winter cutting or burning preferably starting the winter before the first treatment. Spot treatments after three years.
  - Treat the outliers first.
  - Work with your neighbors.
  - Photograph your progress.
  - Be patient.

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### Please Pass It On



- Involve your neighborhood association or local nature club.
- Offer to show others, with workshops and literature, how to control Phragmites.

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### Resources

- PHRAGMITES.ORG
- "Subscribe" to Newsletter@phragmites.org
- USFWS, MDEQ, MDNR Publication  
*"A Guide to the Control and Management of Invasive Phragmites."*  
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