Practical Phragmites Control

2015

By Bob Williams from Phragmites.org
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Questions to be answered today

• How does it spread?
• How can you control it?
• What chemicals do you need?
• Where can you get them?
• How much do they cost?
• What safety practices do you need to follow?
• What equipment do you need?
• When should you treat it?
• Do you need to get any permits?
Menu

Problems
What can we do?
Get Started
Equipment
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When to Treat

Safety
Permits
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Problems caused by Phragmites

Blocks Views
Fire Hazard
Clogs Water Intakes and Reduces Water Flow Capacity

“The Salem 1 nuclear reactor is shut down today because of problems with “grassing,” the blocking of cooling water intakes by vegetation, . . .

Grassing is caused by vegetation such as Phragmites . . .”
Reduces native plant and animal population and diversity
Limits access for recreation, 
Fills in canals, rivers and streams
- Dries out wetlands
- Reduces property values & tourism
- Damages landscaping
- Navigation hazard on roads and waterways
- Hinders search and rescue operations
From the Daily Herald of Provo, Utah
August 2012

• “Forests of the stuff around Utah Lake are harboring West Nile virus-spreading mosquitoes, ruining historic sandy beaches, wrecking critical wildlife habitat, overtaking all native vegetation and making vast stretches of shoreline impassable to anglers and recreation-goers.”

• “In 2004, fireworks sparked a 60-acre phragmites fire that came within feet of burning down dozens of homes in Saratoga Springs.”
Where did this Phragmites come from?

Early 1800’s trade with Europe
When did it become a problem?

We know it was a problem on Staten Island in 1972
Where does it grow?

in retention ponds
Along waterways - large
and small - wild
And well kept
in residential areas
and along railroad rights of way
along expressways
and local roads – in the ditches
and on small hills
and on large
at utility sites
and on construction sites
How does it spread?

by seed and rhyzome
It is persistant
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
Can I dig it out?

Digging, tilling, pulling will help it spread
One Exception to not pulling it out
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.
Exception – cut below the water line
Later in the season
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.
USGS testing for endophyte disruption and gene silencing.

Flooding, cutting and burning in combination with multi-year herbicide applications can control Phragmites.
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.
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.
Why do herbicides work the best?

80% of Phragmites biomass is underground

Rhizomes can persist through most disturbances.

Herbicide is the only known method to effectively kill Phragmites roots and rhizomes and leave the area in a condition which can support other plants.
How can we get the herbicide into the plant?

Foliar spraying
Cut and dab
Glove of death
Wipe-It
Why cut or burn along with the herbicide?

- 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 dead phragmites
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.
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.
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.
Getting started

- Make sure you can identify Phragmites and distinguish it from other plants
Phragmites
Wild Rice
Cattails
Rushes
Sedges
Indian Grass
Phragmites
Native vs. Non-native Phragmites

Make sure you can ID Native Phragmites

Phragmites.info
Leaf Collar

Native
- Purple leaf collar
- Thin Vein

Invasive
- White leaf collar
- Thick Vein

Native Phragmites
Black Lake, MI

Introduced Phragmites
Harsens Island, MI
Collect Information and Make a Plan

- Goals
- Resources – financial & manpower
- Procedures
- Timing
- Equipment needed
- Supplies needed
- Monitoring progress
Equipment
(Do not use any metal tank equipment)

Backpack sprayer

Handheld sprayer
ATV Mounted Sprayer
Gas Powered Pump Sprayer
Gas Powered Pump Sprayer
Equipment for cutting in wet areas

Marshmaster
Equipment for cutting over water
Equipment for cutting under water
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
The Chemicals

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

**Round-Up**
(herbicide and surfactant mix)

Anywhere near water you can only use

**DEQ approved Glyphosate and surfactant**

For a list of DEQ approved chemicals go to:
The Mix

- Herbicide
- Surfactant
- Water
- Water Conditioner
  (Do not use if under DEQ permit)
- Dye (optional)
Why mix my own chemicals?

• DEQ approved 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.
In Michigan, do home owners need to be certified to mix and apply herbicides?

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.
In Michigan, do volunteers at nature areas need to be certified to mix and apply herbicides?

No. Volunteers can use “general use” herbicide products if in compliance with the label requirements, including the use of personal protective equipment and disposal. The following quote is from the MDA procedures manual. (now the MDARD, Michigan Department of Agriculture and Rural Development)

“Example: An individual who works for an organization as a volunteer and is using a non-ready to use pesticide to control pests on the property managed by that organization and is not compensated is exempt from certification/registration requirements.”
Phragmites Herbicides Approved by Michigan DEQ

- 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
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, Eagre, Glyfos, Glypro, Rodeo, Shoreklear
## Phragmites Herbicides - Toxicity

### Comparative Oral Toxicity of Aquatic Herbicides and Common Household Products

<table>
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<tr>
<th>Product</th>
<th>Oral LD$_{50}$ (mg/kg)</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicotine</td>
<td>50</td>
<td>Personal choice</td>
</tr>
<tr>
<td>Caffeine</td>
<td>140</td>
<td>Personal choice</td>
</tr>
<tr>
<td>Hot sauce (capsaicin)</td>
<td>161</td>
<td>Food seasoning</td>
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<tr>
<td>Bleach (sodium hypochlorite)</td>
<td>192</td>
<td>Household cleaner</td>
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<tr>
<td>Aspirin</td>
<td>200</td>
<td>Medication</td>
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<tr>
<td>Endothall</td>
<td>233</td>
<td>Herbicide</td>
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<td>Naproxen sodium</td>
<td>248</td>
<td>Medication</td>
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<tr>
<td>Cinnamon</td>
<td>275</td>
<td>Food seasoning</td>
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<tr>
<td>Diphenhydramine HCl</td>
<td>500</td>
<td>Antihistamine</td>
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<tr>
<td>Diquat</td>
<td>866</td>
<td>Herbicide</td>
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<tr>
<td>Pink bismuth (bismuth subsalicylate)</td>
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<td>Medication</td>
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<td>Acetaminophen</td>
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<th>Product</th>
<th>Oral LD$_{50}$ (mg/kg)</th>
<th>Usage</th>
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<tr>
<td>Vitamin C</td>
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<td>Vitamin</td>
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<tr>
<td>Topramezone</td>
<td>&gt;2,000</td>
<td>Herbicide</td>
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<tr>
<td>Table Salt</td>
<td>3,000</td>
<td>Food seasoning</td>
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<td>2,4-D</td>
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<td>Vinegar (Acetic Acid)</td>
<td>3,310</td>
<td>Food seasoning, household cleaner</td>
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<tr>
<td>Bispyribac-sodium</td>
<td>4,077</td>
<td>Herbicide</td>
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<tr>
<td>Carfentrazone</td>
<td>&gt;5,000</td>
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<tr>
<td>Flumioxazin</td>
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<td>Fluridine</td>
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<td>Imazamox</td>
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<td>Imazapyr</td>
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<tr>
<td>Nail Polish Remover</td>
<td>&gt;5,000</td>
<td>Beauty product</td>
</tr>
<tr>
<td>Penoxsulam</td>
<td>&gt;5,000</td>
<td>Herbicide</td>
</tr>
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Surfactants

• Enhance spreading, sticking and wetting properties of the herbicide. Break down the waxy surface coating on plants.

• **Cygnet Plus**
  - Biodegradable
  - d’limonene, extracted from citrus rind
  - methylated seed oil - canola, soybean, or cotton
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
Desirable Water Qualities

• Clean, clear and free of organic materials

• Low mineral content (soft water)

• Slightly acidic (pH from 3 to 6)
Water Conditioner

• Lowers pH

• Do not use if treating under DEQ permit

• I prefer *AquaBupH* liquid water conditioner
  – Use 1/2 oz. per gallon
Preferred Water

• Distilled water
• Soft water
• Municipal water
• Clean clear lake water
• Clean clear rain water.

• Not well water or pond water
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% Glyphosate product.
    (2 oz. per gallon = 1.5% solution)
  – 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
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 ½ oz. per gallon here – mix it
- Add Herbicide – 53.8 % Glyphosate (2 oz.) – 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.
Retreatment

- The maximum herbicide quantities to be used that are given on the label are “per treatment”

- State of Michigan DEQ permits 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.
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
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.) – 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
Chemical Availability & Costs

• **HERBICIDE**
  – Most brands of Glyphosate herbicide (53.8% a.i.) are available in 2.5 gallon containers for about $40 per gallon. ($100 min.) *Shoreklear* is available in one quart containers for about $50.

• **SURFACTANT**
  – *Cygnet Plus* surfactant is available in a one gallon container for about $25 per gallon.

• **WATER CONDITIONER**
  – *AquaBupH* liquid water conditioner is available in 2.5 gallon containers for about $25 per gallon.

• **DYE**
  – *Cygnet Select* liquid organic water dye is available in one gallon containers for about $25 per gallon.

• **OPTION** – *Shoreklear Plus*, a combination of Glyphosate herbicide (18% a.i.) and a surfactant, is available in a one gallon container for about $60 per gallon. 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.
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
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
My Preferences

Cygnet Plus
2.5 gallon

AquaPro
2.5 gallon

From Cygnet Enterprises in Flint, MI
1-800-359-7531 – Joe Bondra
When to Treat

• In Southeast Michigan – Mid-August to end of September

• Not after the first killing frost

• Not within 4 weeks of the last cutting or burning
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
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
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
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
Herbicide Safety

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

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

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

Dedicated Location & Pesticide Spill Kit

Funnels
Emergency Information

Secondary Containment Buckets
Phragmites.org

Locked Storage Cabinet
Measuring Bottles

Spill Containment Pan
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.
Pesticide Safety Tips from State of Michigan Permits

• 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.

• 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.
Permits

- To Remove
- To Burn
- To Cut
- To Herbicide
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.
Permits to Burn Phragmites

Local Fire Department only

(Hire a prescribed burn contractor)
Permits to Cut Phragmites
Michigan DEQ

If between the OHWM and the water’s edge a permit to cut and a Phragmites control plan are required for properties in the St. Clair Flats.

For any phragmites in standing water on the Great Lakes and Lake St. Clair a permit to cut and a Phragmites control plan are required.

Cutting permits are valid for three years.
If you have questions? – call MDEQ at 800-662-9278
 Permit to herbicide Phragmites
Environmental Protection Agency
National Pollutant Discharge Elimination System (NPDES)

EPA permits are issued through the
Michigan DEQ as part of the Aquatic Nuisance control program.

contact Jeff Fisher - MI DEQ 517-335-4188
Permit to herbicide Phragmites
Michigan DEQ
(Part 33 of NREPA, as amended)

NOT REQUIRED
Above the Ordinary High Water Mark (OHWM) or
On a pond of less than 10 Acres with no outlet and
no recorded threatened or endangered species
But a record of treatment must be maintained for one year.

REQUIRED
Any other body of water or where the Phragmites stems
being treated are in standing water or below the OHWM on
the Great Lakes or Lake St. Clair.
Herbicide Permit – Michigan DEQ
(Part 33 of NREPA, as amended)

Individual Permit
Applies to a single water body or site.
Applications accepted Oct. 1 through Aug. 15 only
Submit by July 15 for a September 1st treatment.

General Permit (GP) or Certificate of Coverage (COC)
Simplified process. Follow DEQ control plan.
Apply no later than mid-September to treat in September.

Questions? Call DEQ at 517-241-1554
Hiring a Contractor

• If spraying below the Ordinary High Water Mark (OHWM) they need to have
  – Pesticide Application Business License
  – Category 5 Aquatic Pest Management certification for spraying in wet areas
  – Category 6 Right-of-Way certification for spraying in dry areas

• A list of MDARD approved contractors is at: http://www.michigan.gov/mda/0,1607,7-125-1569_16988_35288-11993--,00.html
Is anyone doing anything about Phragmites?

- DNR research at St. John’s Marsh for 10 years.
- Cornell University research for 10 years
- Harsens Island Phragmites Committee since 2007
- Beaver Island program since 2008
- Lake Charlevoix Association since 2009
- Tip-of-the-Mitt association Grand Traverse Bay area since 2009
- Clay Township Phragmites Advisory Board 2010
- Great Lakes Commission
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
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.
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
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.
View Enhancement
Recreational Access

before
after
Fire Safety

before
after
Ecosystem Restoration

After winter cutting & before first treatment
After fall treatment and winter cutting
After dredging
2 years later
Natural regrowth
Mid-summer – St. John’s Marsh

Treated 9 months ago, not cut

Treated 9 months ago, cut 6 months ago

Not Treated or cut
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.
Please Pass It On

- Involve your neighborhood association or local nature club.

- Offer to show others, with workshops and literature, how to control Phragmites.
Resources

- Phragmites.info & Phragmites.org
- “Subscribe” to Newsletter@phragmites.org
- www.ClayTownship.org
- Michigan DEQ web page:
  "Control and Management of Invasive Phragmites"
  0,1607,7-135-3313_3677_8314-178183--,00.html
- USFWS, MDEQ, MDNR Publication
  “A Guide to the Control and Management of Invasive Phragmites.”
Review

Which of these photos is Phragmites?
The best time to spray Phragmites is

A. July through September
B. Mid-August through September
C. September through November
The best time to cut Phragmites is

A. One week before you spray
B. Three days after you spray
C. Between November and May
Cutting once a year helps control Phragmites by

A. Allowing easier access for spraying vehicles.
B. Removing dead material which can use up herbicide during spraying.
C. Creating shorter stands of Phragmites for easier spraying over top.
D. All of the above.
E. None of the above.
If you hire a contractor to spray over water and on dry land they need to have

A. Category 5 aquatic pest management certification.
B. Category 6 right-of-way certification.
C. A pesticide application business license.
D. All of the above.
E. None of the above.
“A.I.” means

A. The percentage of "Active Ingredient" in the herbicide bottle
B. The number of ounces of "Active Ingredient" in the bottle
C. The expected hours of "Activity of Ingredients" in the bottle.
True or False

- A surfactant is a wetting agent which makes the herbicide work better.

- Homeowners are not allowed to mix herbicides from concentrates without a license.

- Herbicides to control Phragmites will not damage other plants in the area.
True or False

• Using herbicide is the only way to reduce the strength of a patch of Phragmites.

• A homeowner does not need a permit to spray on dry land above the ordinary high water mark.

• It is not a good idea to use over-the-counter RoundUp around water.

• If you do everything right you should expect to see the Phragmites start to turn yellow within 48 hours.

• Well or pond water is not recommended for mixing your own herbicides.
True or False

• To dispose of water used in cleaning the sprayer you should pour it into a municipal sanitary sewer.
• You should treat the smaller patches of Phragmites first.
• One of the best ways to control a small patch of Phragmites is to dig it out by the roots.
• Cutting every two weeks for at least three years can eradicate a patch of Phragmites.
• Removing and disposing of the seed heads for three years in a row can eradicate a patch of Phragmites.
Resources

• Phragmites.info & Phragmites.org
• “Subscribe” to Newsletter@phragmites.org
• www.ClayTownship.org

• Michigan DEQ web page:
  "Control and Management of Invasive Phragmites"
  0,1607,7-135-3313_3677_8314-178183--,00.html

• USFWS, MDEQ, MDNR Publication
  “A Guide to the Control and Management of Invasive Phragmites.”
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