



Phragmites Invasions in Michigan
Building Capacity for Management

Invasive *Phragmites* Management and Control in Michigan: Questionnaire Summary Report

This report was developed by the Great Lakes Commission as part of the project *Regional Symposium to Build Capacity for the Management and Control of Phragmites australis*. The project was conducted from June 2010-September 2011 and was funded by the Michigan Coastal Management Program under the Michigan Department of Environmental Quality.

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INTRODUCTION

The Great Lakes Commission (GLC), in cooperation with partner agencies the Michigan departments of Natural Resources and Environmental Quality and the Michigan Natural Features Inventory, hosted the event *Phragmites Invasions in Michigan: A Symposium to Build Capacity for Management* on March 28-30, 2011 in East Lansing, Mich. An important outcome of the symposium is a strategic framework to advance coordinated, sustainable management and control of invasive phragmites in Michigan.

In preparation for the symposium, and to inform the development of the strategic framework, GLC staff conducted a questionnaire on invasive phragmites management and control. The purpose of the questionnaire was two-fold: 1) to establish a baseline understanding of the status of invasive phragmites management in Michigan, and 2) to identify gaps in management and opportunities to improve cooperation. The questionnaire was developed in 2010 with input from project partners. When the format and content of the questionnaire was finalized, questions were loaded into the SurveyMonkey online platform (www.surveymonkey.com). This software enables users to build logic into questions to refine questionnaires; for example, a respondent that answers “yes” to a particular question may then be routed to a series of follow-up questions, whereas a respondent that answers “no” will skip the follow-up questions.

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Invasive Phragmites Management Questionnaire

4. Phragmites in your Jurisdiction

24%

1. The following question deals with non-native phragmites invasions in your jurisdiction. Using the matrix below, please describe the spatial extent of invasive phragmites populations in the following habitats. If non-native phragmites has invaded habitats in your jurisdiction that are not listed below, please describe these habitats and the extent of invasion in the box provided below.

	N/A	Absent	Isolated	Local	Widespread
Coastal wetlands/coasts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inland wetlands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Roadside ditches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Riparian corridors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upland habitats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify):

2. How severe do you perceive the problem of non-native phragmites invasion to be in your jurisdiction?

Not a problem at all

A minor problem

A significant problem

A severe problem

Screen shot showing example of appearance of online questionnaire

The target audience for the questionnaire included individuals responsible for on-the-ground invasive phragmites control in the state of Michigan, with a focus on state and local governments and non-governmental organizations (NGOs). An extensive distribution list was obtained through online research and recommendations from project partners. An invitation to respond to the questionnaire, including a link to the questionnaire, was e-mailed to the resulting contact list in January 2011. In addition, the link to the questionnaire was distributed widely through several professional networks. It is important to note that because of the broad distribution of the questionnaire invitation, it is impossible to calculate response rates. As of April 29, 2011, 79 individuals had begun the questionnaire and 59 had completed it, for a completion rate of 79%. This report summarizes the results of those responses, a general analysis of trends and potential inferences.

RESULTS

Questions were divided into topical sections and the results summarized below are organized by these sections. This report is not intended to present statistical results; rather, it is intended to be an analysis of general trends. Unless otherwise specified, questionnaire respondents were able to select multiple answers to a single question, thus, the sum of response percentages may not equal 100%.

Section 1: Background Information

1.a *In what capacity do you deal with invasive phragmites? In this role, with who are you affiliated?*

A majority (81%, N=74) of respondents deals with invasive phragmites in a professional capacity; 15% responded that they work with phragmites as volunteers. Some who filled out the questionnaire indicated that they are students carrying out research, or concerned citizens who do not deal with invasive phragmites at this time but are aware of the issue. Overall, questionnaire respondents represent a diverse range of sectors, with large numbers working for the state government and NGOs (Fig. 1).

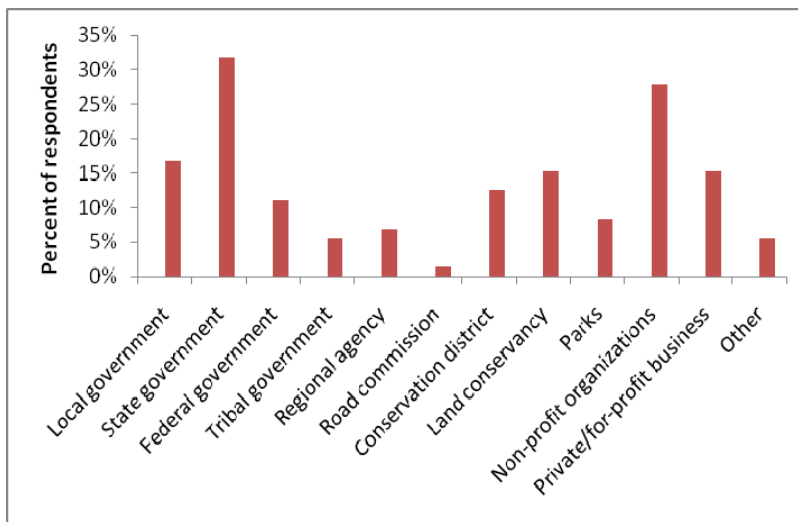


Figure 1. Sector breakdown of invasive phragmites questionnaire respondents. N= 72.

1.b *What is the scale of managed lands under your jurisdiction?*

Scales at which respondents are managing and controlling invasive phragmites varied (Fig. 2). Those that responded “other” work at scales ranging in size from the entire Upper Peninsula of Michigan to the shoreline of an individual inland lake. Some respondents commented that the wording of this question was misleading, as not all who deal with invasive phragmites have a clear jurisdiction or a charge to manage lands.

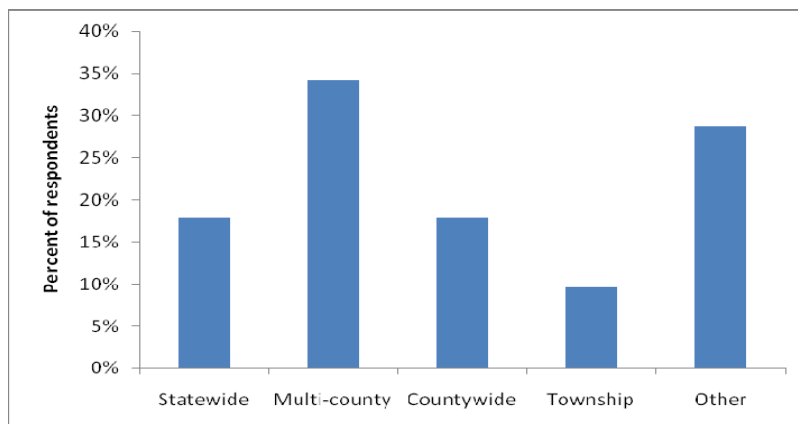


Figure 2. Scale of lands managed by respondents. N=73.

Section 2: Monitoring for Detection

2.a *Do you or your organization have an early detection monitoring program for invasive phragmites? If yes, what monitoring techniques are you currently using?*

A minority (45%, N=74) of respondents' organizations or agencies have an early detection monitoring program for invasive phragmites. Of those that responded yes, most are using simple monitoring techniques such as plant surveys and citizen reporting (Fig. 3). A smaller percentage of respondents use technology such as aerial surveys and aerial imagery in their monitoring programs.

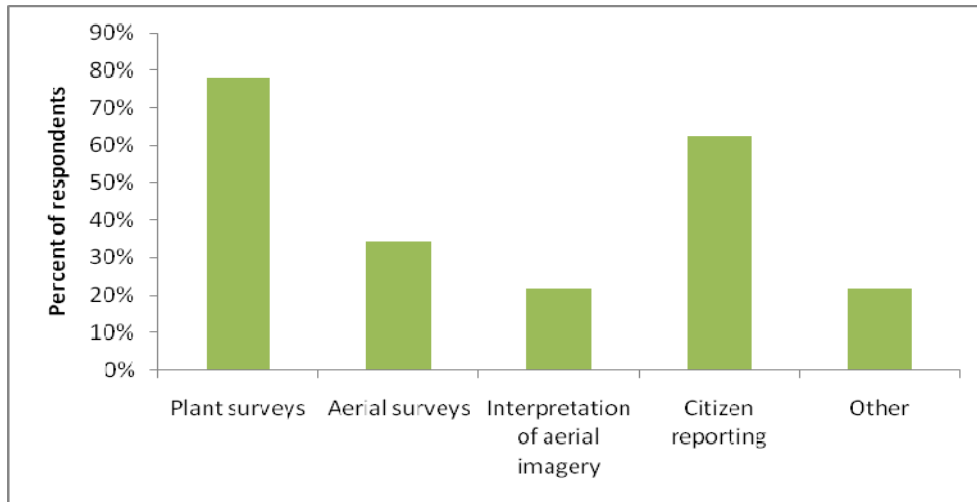


Figure 3. Invasive phragmites monitoring techniques currently in use by questionnaire respondents. N=32.

2.b *How frequently do you monitor for invasive phragmites? Who is carrying out monitoring for Invasive phragmites in your jurisdiction?*

A large majority of respondents that have monitoring programs are carrying out monitoring activities at least once per year, with most (58%.) monitoring more frequently (Fig. 4). Most monitoring activities are being carried out by agency/organization staff and volunteers (Fig. 5). A majority (66%) of respondents with invasive phragmites monitoring programs utilize volunteers in their monitoring activities.

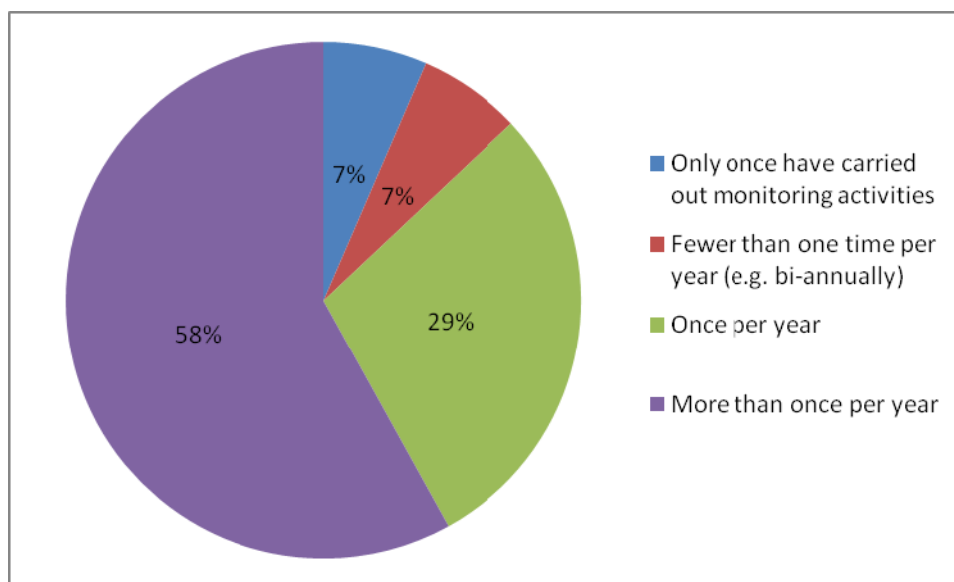


Figure 4. Frequency of monitoring for invasive phragmites. Respondents were asked to select one best answer. N=31.

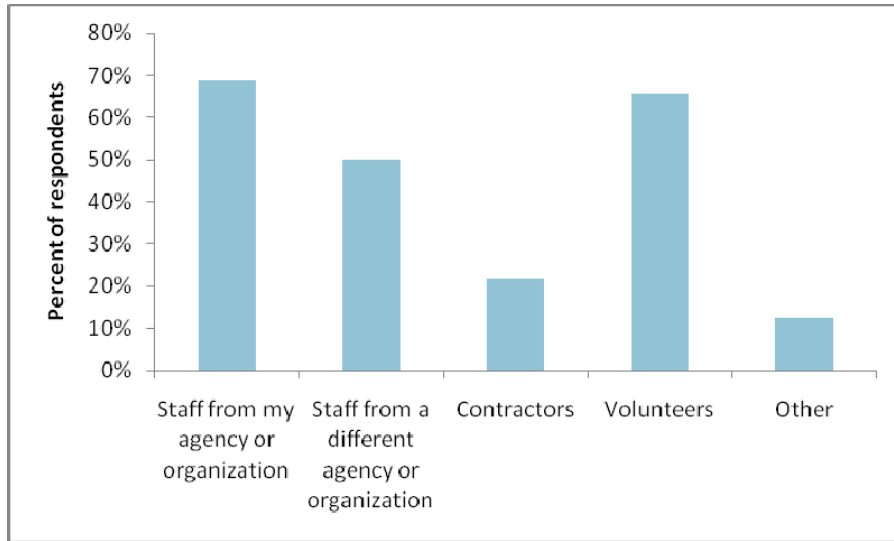


Figure 5. Breakdown of groups carrying out monitoring activities. N=32.

2.c *What types of monitoring data on non-native phragmites populations do you collect? To what, if any, online invasive species databases are you reporting occurrences of non-native phragmites?*

Of questionnaire respondents with a monitoring program (N=32), 88% collect data on presence/absence and stand size, 69% collect information on stand density, and 56% on mixed community vs. monoculture status. 28% of respondents indicated that they collect other types of monitoring data. Examples of other data collected, as provided by respondents, include: wet vs. dry site condition, access for treatment, results of previous treatments, culm height, presence of runners, presence of and proximity to rare species, source of infestation, and wildlife/ecological impacts.

A handful of questionnaire respondents indicated that they are reporting monitoring results to online databases; a larger number are aware of such databases but are not reporting to them (Table 1). Of respondents that are reporting monitoring data to “other” entities, many are sharing information with state agencies and local government units.

Table 1. Trends in reporting invasive phragmites monitoring data to online databases. N=31.

Answer Option	Response Count
Midwest Invasive Species Information Network (MISIN)	8
National Institute of Invasive Species Science (NISS)	1
Great Lakes Aquatic Nonindigenous Species Information System (GLANSIS)	0
iMapInvasives	0
EDDMapS	0
I am aware of such databases, but am not currently reporting to them	12
I was not aware of such databases	6
Other	8

2.d *When managing invasive phragmites, it is important to be aware that a native strain of phragmites exists in the Great Lakes region as part of healthy, diverse natural communities. Are you and/or your colleagues aware of the native strain of phragmites and how to identify it? To your knowledge, is there native phragmites in your jurisdiction?*

A large majority (86%, N=73) of questionnaire respondents indicated that they are aware of the native strain of phragmites in general. 56% are aware of its existence in their jurisdictions, 20% answered that there is no native phragmites in their area, and 23% indicated that they were unsure (N=73).

Section 3: Invasive Phragmites Infestations

3.a *To your knowledge, has non-native phragmites invaded areas in your jurisdiction? Please describe the spatial extent of invasive phragmites populations in the following habitats. If non-native phragmites has invaded habitats in your jurisdiction that are not listed, please describe these habitats and the extent of invasion.*

An overwhelming majority (99%, N=73) of questionnaire respondents said that non-native phragmites has invaded their area, with the remainder responding “not sure.” Infestations were described as most widespread in coastal areas, with more local or isolated infestations in habitats such as inland wetlands, roadside ditches, and riparian corridors (Fig. 6). Respondents described invasive phragmites infestations in upland habitats as mostly isolated or absent. Other habitats in which invasive phragmites infestations were noted include inland lake shorelines, woodlands, and disturbed areas such as parking lot edges and industrial sites.

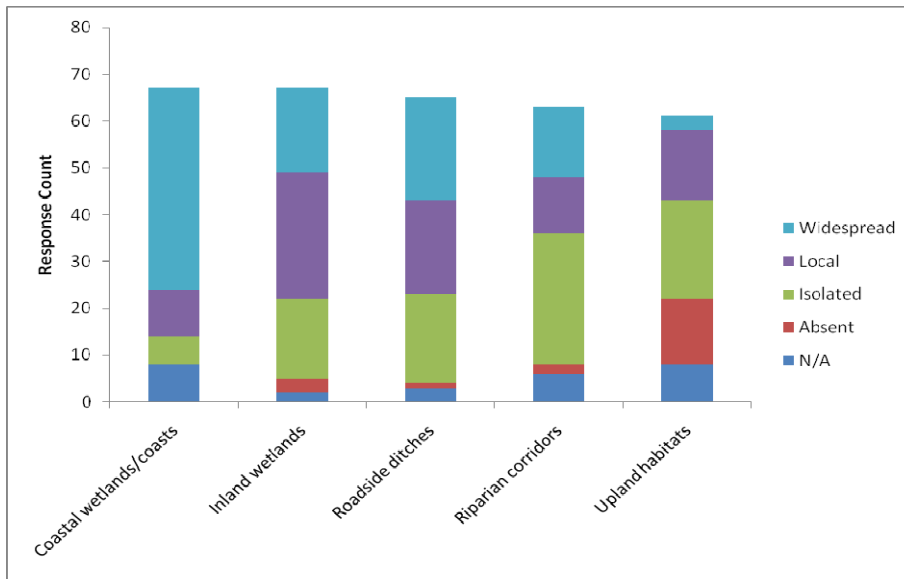


Figure 6. Spatial extent of non-native phragmites infestations in various habitats in respondents’ jurisdictions. N=69.

3.b *How severe do you perceive the problem of non-native phragmites invasion to be in your jurisdiction? What types of impacts from non-native phragmites are causing concern in your jurisdiction?*

Most questionnaire respondents (59%) described invasive phragmites as a significant problem; another 28% perceived the issue to be a severe problem (Fig. 7). A large majority of respondents listed invasives phragmites’ impacts to wildlife habitat, biodiversity, and aesthetics (e.g., lake views) as significant concerns (Table 2).

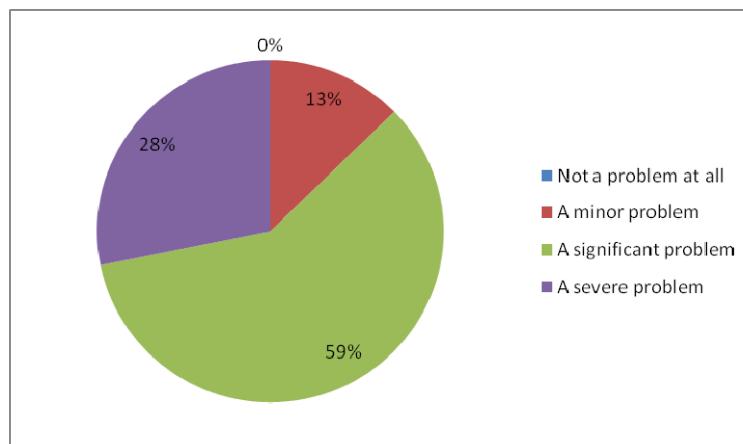


Figure 7. Respondents’ perceptions of the severity of non-native phragmites infestations in their jurisdictions/areas. Respondents were asked to select one best answer. N=71.

Table 2. Percent of respondents indicating various impacts of invasive phragmites as concerns. N=72.

Impacts of concern	Percent of respondents
Wildlife habitat impacts	94%
Biodiversity impacts	92%
Aesthetic impacts	81%
Recreational impacts	64%
Ecosystem service impacts	60%
Health and safety impacts	38%
Impacts to other natural resource commodities	17%
Infrastructure impacts	14%
Other	11%

Section 4: Distribution Mapping

4.a *What kind of mapping of invasive phragmites populations, if any, have you performed? Are your maps and/or data on non-native phragmites infestations publicly available? Does your jurisdiction use mapping in the monitoring of post-treatment areas?*

The largest percentage (47%) of respondents uses a combination of paper-supported and mobile device-supported mapping techniques to track the distribution of invasive phragmites (Table 3). Resulting maps are made publicly available in the case of 47% of respondents; 30% are not publicly available and 23% of respondents were not sure (N=53). A majority (60%, N=52) of respondents with mapping programs are using mapping in post-treatment monitoring.

Table 3. Types of distribution mapping used by questionnaire respondents. N=71.

Type of mapping	Percent of respondents
None	24%
Paper-supported only	14%
A combination of mobile device-supported and paper-supported	47%
Entirely mobile device-supported	11%
Other	20%

Section 5: Management and Control Strategies

5.a *Does your jurisdiction have a management/control plan for invasive plants in general? Does your jurisdiction have a management/control plan for phragmites?*

A majority (53%, N=61) of respondents has a management and control plan for invasive plants; a majority (74%, N=61) also has a management and control plan for invasive phragmites. Only 8% of these invasive phragmites plans were described as “long-term and sustainable;” the remainder were described as more reactive, short-term, and site-specific.

5.b *If yes, does the plan include a decision-support structure for prioritizing treatment areas? What decision-making strategies/criteria do you use in prioritizing areas for treatment of invasive phragmites?*

A majority (56%, N=41) of respondents with an invasive phragmites management and control plan indicated that the plan included a decision-support structure for prioritization. The most common strategies/criteria for prioritization included protecting high-value or high-quality sites, responding to early infestations, and acting on a window of opportunity for treatment (Table 4).

Table 4. Strategies and criteria used to prioritize sites for invasive phragmites treatment. N=26.

Strategy/Criterion	Percent of respondents
Protecting high-value/high-quality sites	92%
Responding to early infestations	81%
Acting on a window of opportunity for treatment	81%
Treating source infestations	42%
Interrupting vectors	27%
Other	12%

5.c *Are you involved in any phragmites control activities/projects in your jurisdiction? If yes, what is the funding source and level?*

84% of questionnaire respondents are directly involved in invasive phragmites control activities (N=61). Figure 8 shows the broad distribution of funding sources for invasive phragmites treatment. 47% of respondents indicated that their control projects have annual funding of \$20,000 or less, 29% have \$20,000-50,000, 18% have \$50,000-100,000, and only 11% have greater than \$100,000 in annual funding (N=45).

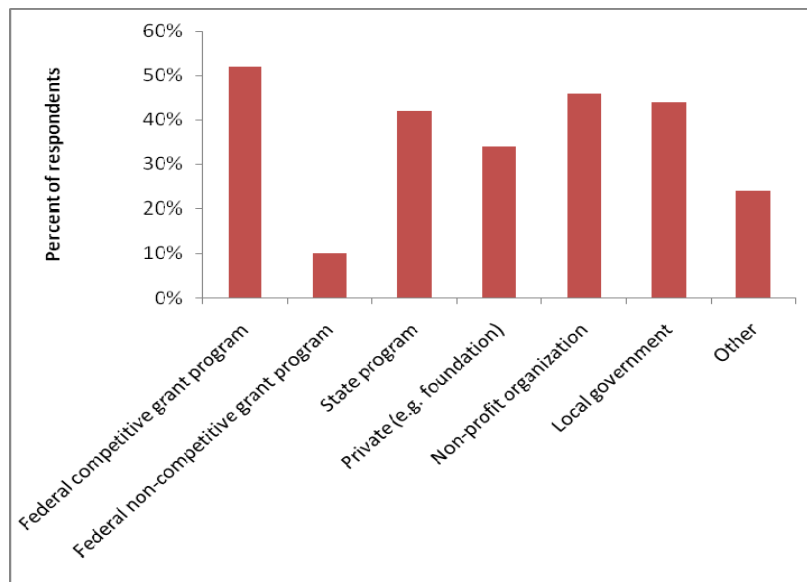


Figure 8. Funding sources for invasive phragmites control projects. N=50.

5.d *What methods are being used for invasive phragmites control in your jurisdiction? Who is implementing invasive phragmites treatment?*

Almost all respondents (98%, N=51) that are carrying out invasive phragmites control projects use herbicides. In addition, 63% use mechanical removal, 49% use prescribed fire, and 18% use water level management. Comments from respondents indicated that many are using these control methods in combination. The work of implementing invasive phragmites treatment is spread out among stakeholder groups, but a majority of respondents uses contractors (Table 4).

Table 4. Groups carrying out invasive phragmites control projects. N=51.

Group	Percent of respondents
Contractors	73%
Staff from my agency/organization	53%
Volunteers	49%
Staff from another agency/organization	47%
Private landowners	45%
Other	12%

5.e *Are you aware of any threatened or endangered species that are at risk during treatment of phragmites in your jurisdiction?*

A majority (57%, N=51) of respondents said that they are aware of threatened and endangered species that might be at risk during phragmites treatment. Examples of threatened plant species include Lake Huron tansy, Houghton's golden rod, wild rice, Michigan monkey flower, Pitcher's thistle, and dwarf Lake Iris, among others. Several species of threatened and endangered wildlife were also noted, including Blanding's turtle, piping plover, fox snake, and marsh wren.

5.f *Do you coordinate with any of the following entities to implement invasive phragmites management and control activities?*

Questionnaire respondents partner with a wide range of stakeholder groups; a majority of respondents indicated that they have partnerships with local governments, non-profit organizations, state agencies, and private landowners (Table 5). 8% of respondents, however, that indicated that they do not currently partner with any other groups; some commented that they are seeking to do so.

Table 5. Overview of partnerships utilized for invasive phragmites management and control. N=50.

Group	Percent of respondents
Local governments	78%
Non-profit organizations	70%
State agencies	62%
Private landowners	56%
Conservation districts	44%
Land conservancies	40%
Parks	38%
Other divisions, offices, or programs within your agency	36%
Federal agencies	28%
Road commissions	24%
Regional agencies	22%
Tribal agencies	20%
Other	10%
Do not coordinate with others	8%

Section 6: Regulations and Policy

6.a *In your conduct of invasive phragmites management and control activities, were you required to obtain permits or other authorization from federal, state, and/or local authorities? On a scale from 1-5, with 1 being very difficult and 5 being very easy, please rank your perception of the ease of obtaining permits.*

A majority (74%, N=50) of respondents have been required to obtain permits for invasive phragmites control activities. Respondents' perceptions of the ease of obtaining certain permits varied (Fig. 9).

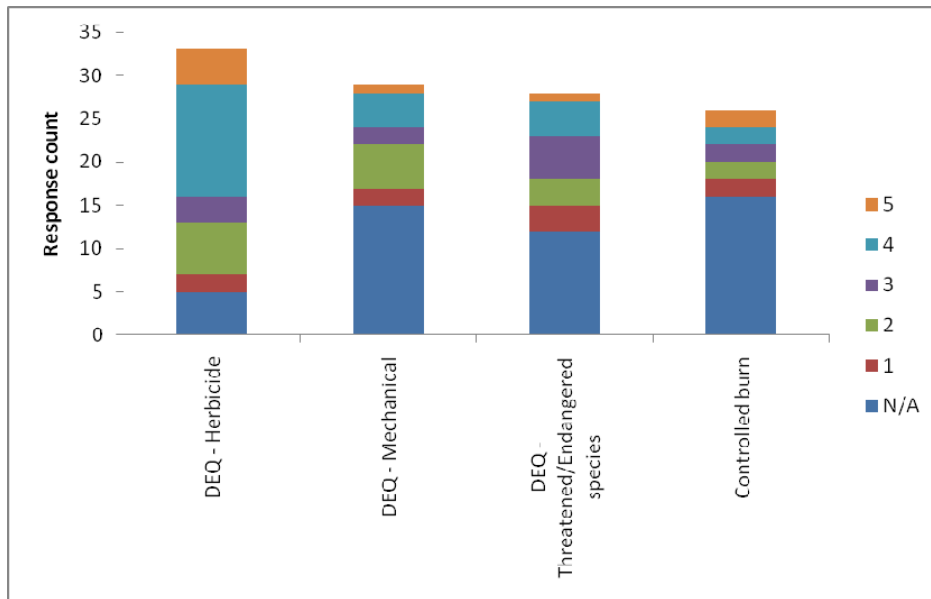


Figure 9. Perceived ease of obtaining permits related to invasive phragmites control, with 1 being very difficult and 5 being very easy. DEQ = Michigan Department of Environmental Quality. N=34.

6.b *Are you aware of non-native phragmites’ status as a restricted invasive species in Michigan, prohibiting its possession or transport without a proper permit? Are you aware of any local (e.g., township, city) ordinances or resolutions related to phragmites control in your jurisdiction?*

A majority (63%, N=60) of questionnaire respondents indicated that they are aware of non-native phragmites’ status as a restricted invasive species in Michigan. 36% of respondents (N=59) are aware of local ordinances related to phragmites control; these include township- and county-level ordinances.

Section 7: Outreach and Landowner Involvement

7.a *What types of outreach and/or education efforts have you conducted in your jurisdiction regarding invasive phragmites? What outreach tools or general education efforts have you employed?*

Most respondents indicated that they had performed some type of outreach and/or education efforts related to invasive phragmites. The most common activities included general education on invasive plants, identification of non-native phragmites, and treatment options for private landowners (Table 6). The most widely used outreach and education tools were brochures or other information materials and public meetings or workshops (Table 7). In general, respondents found that their outreach activities were well received by the public. Several noted that private landowners had reservations about using herbicides, and were not motivated to participate in long-term management. These issues, however were often addressed through continued education.

Table 6. Types of outreach/education activities carried out by respondents. N=61.

Type of outreach/education activity	Percent of respondents
General education on invasive plants	74%
Identification of non-native phragmites	67%
Treatment options for landowners	51%
Project-specific notification/publicity	49%
Information/education on monitoring for detection	39%
Information/education on post-treatment monitoring	33%
Other (please specify):	23%
None	5%

Table 7. Outreach/education tools utilized by questionnaire respondents. N=54.

Outreach/Education tool	Percent of respondents
Brochures or other informational materials	72%
Public meetings/workshops	69%
Internet-based tools and resources	48%
Targeted mailings	30%
Other public forums	19%
Other	19%
Radio and/or TV	15%
Door-to-door campaigns	9%

Section 8: General Comments

Questionnaire respondents commented on other challenges related to invasive phragmites management and control; for example, it was noted that the species is still being introduced and spread via vectors such as landscaping nurseries and wastewater treatments plants.

Many respondents commented on the dedicated involvement from volunteers and local communities, but noted a significant need for organizational support, informational materials, and technical assistance such as guidance in obtaining permits. Respondents emphasized the need for a coordinated approach, sharing of success stories and collaboration across the Great Lakes basin. They expressed hope that the momentum for the state of Michigan's efforts would continue.

CONCLUSION

Although these data represent only a sample of the opinions and experiences of those working on invasive phragmites issues in Michigan and the Great Lakes region, they provide valuable insight in efforts to improve management. The following is a general assessment of invasive phragmites management in the state based on inferences made from the questionnaire results.

In general, **the nature of invasive phragmites and its impacts creates the need for cooperative approaches to management.** Although a large number of questionnaire respondents were from state governments and non-profit organizations, there is no single entity responsible for management and control and funding sources are diverse. Work is happening at various spatial scales, ranging from individual inland lakes to areas that span multiple counties. Invasive phragmites impacts a diversity of habitats, including beaches, inland wetlands, and disturbed sites such as landfills. Questionnaire participants recognized the challenges posed by the diffuse nature of this issue, with many commenting on the urgent need for better coordination and enhanced communication.

Results from this questionnaire indicate that **monitoring efforts for detection of invasive phragmites can be strengthened.** Although many respondents are mapping invasive phragmites and most indicated an awareness of online databases, a small number are reporting to these databases. Some basic data on phragmites infestations is commonly collected, but monitoring protocols and types of data collected vary widely. There appears to be a need for standardized monitoring methods, which could improve usage of online databases. The involvement of citizen scientists in monitoring efforts seems high; thus, ongoing training and education is needed to ensure that good data is being collected.

As discussed, invasive phragmites management benefits from a cooperative approach; in areas where the plant has not invaded, a preventative approach is also needed. However, results of the questionnaire indicate that **current practices are insulated and reactive.** A large majority of management plans were described as site-by-site, short-term, and responsive in nature. Often, prioritization for treatment is based solely on an opportunity such as a willing landowner or funding availability. While unique site conditions should be considered, truly effective prevention and control requires proactive, long-term, and cooperative management plans.

In controlling invasive phragmites and setting restoration goals, responses show that **diverse values of user groups, land owners, and managers must be considered.** Although most questionnaire respondents indicated that impacts to wildlife habitat and biodiversity are prominent concerns, numerous other impacts such as those to recreation, human safety and infrastructure are also important. Prioritization processes vary based on the needs of groups carrying out invasive phragmites control and the values of those using the land. Consideration of these different viewpoints and values is vital to long-term, coordinated management planning.

Questionnaire results indicate that continued education of practitioners and the public is important. For example, technical assistance with permitting was identified as a need. Despite the many challenges posed by invasive phragmites, **stakeholders across the state and region are doing excellent work and making progress in the management of phragmites.** A large majority of questionnaire respondents are currently partnering with various groups to carry out management and control activities. Volunteers are engaged in all steps of the process, from monitoring to treatment, providing excellent community-building opportunities. Most respondents are doing outreach and education in the areas in which they work, and these efforts have been largely well-received by the public. These efforts should be strengthened and coordinated to advance positive change.