

Decision-support for *Phragmites* management

A primer on the Phragmites Adaptive Management Framework and Phragmites Management Look-Up Table

Two science-based tools are available to recommend site-specific *Phragmites* management treatments to a range of stakeholders, from resource management professionals to individual landowners.

Depending on site conditions and manager needs, each tool may give the same or slightly different advice. This reflects the fact that understanding effective *Phragmites* control across the Great Lakes region is an ongoing process, and the tools use different approaches and information to generate recommendations.

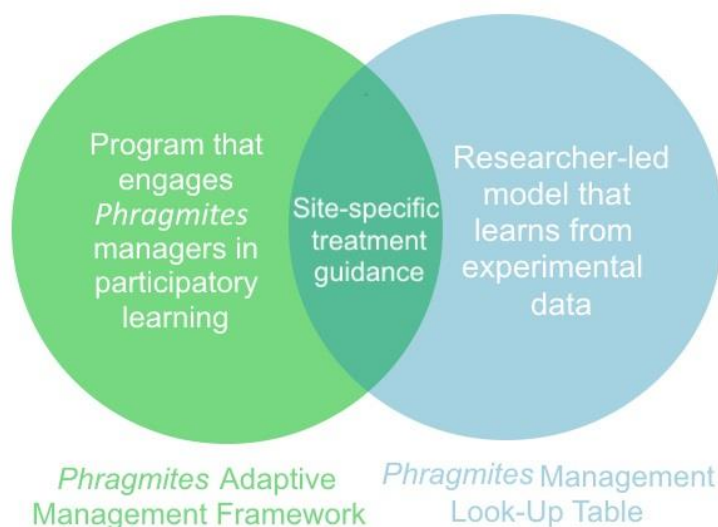


Figure 1 – High-level similarities and differences between the two approaches

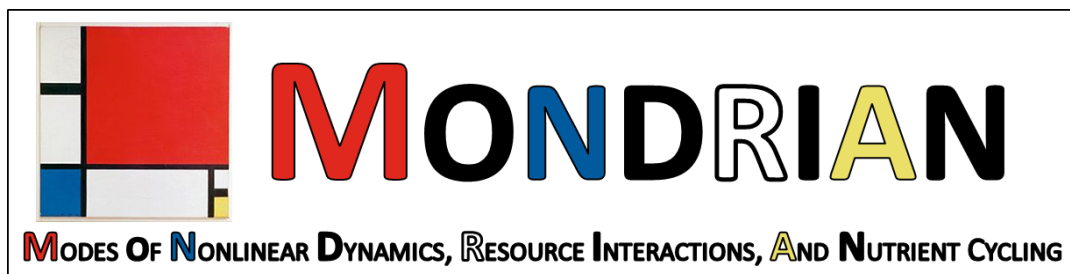
Phragmites Adaptive Management Framework



- The [Phragmites Adaptive Management Framework \(PAMF\)](#) includes a monitoring protocol, a data-driven model that predicts how *Phragmites* will respond to different management alternatives, and a central database with an associated web hub where the results from all management efforts are reported.

- PAMF uses data from a community of *Phragmites* managers that contribute their on-the-ground activities, monitoring data, and results to a predictive, data-driven model that then provides site-specific treatment guidance.
- *Phragmites* managers enrolled in PAMF are provided with annual site-specific guidance that is balanced between treatment effectiveness and resource efficiency.
- PAMF collects data on management activities that have been previously difficult to assemble, including data pertaining to management techniques, cost, and equipment.
- Developed by the U.S. Geological Survey and the Great Lakes Commission with technical support from the University of Georgia.
- [Visit the PAMF Portal here](#)

Mondrian model and *Phragmites* Management Look-up Table



- The *Phragmites* management [“Look-up Table”](#) is a quick reference tool based on a complex computer model known as Mondrian, developed for basic and applied wetland research and tested using wetland data from field studies, experiments, and remote sensing.
- The Look-up Table uses experimental data to predict the effectiveness of a selection of management actions based on site conditions. *Phragmites* managers indicate their site conditions in the Look-up Table interface to view the predicted effectiveness of treatment options for that site.
- Data in the Look-up Table are the result of 8,000 runs of the Mondrian model, which simulate ecosystem responses to treatment options based on known wetland ecology principles.
- For experienced users, the underlying Mondrian model is available to download and run as an .exe file (PC only) and is accompanied by an extensive [user guide](#).
- The model and Look-up Table were developed by the University of Michigan, Michigan Tech Research Institute, The University of Northern Iowa, and Texas A&M University.
- [View the Look-up Table here](#)

Comparison of key characteristics

<i>Phragmites</i> Adaptive Management Framework	<i>Phragmites</i> Management Look-up Table
Program where participants engage in regional learning and receive site-specific management guidance	Model-based management decision-support tool that uses wetland data to offer site-specific management guidance
Developed specifically to recommend <i>Phragmites</i> management treatments to participants	Developed as part of a research program to understand wetland ecology and function, specifically wetland plant invasion
An adaptive management program that is informed by participant data and feedback	An adaptive management model that is informed by researcher-driven experimental data
A series of state-and-transition models that learn from participant data and then predict the most effective management action for each phase in the growing cycle	A process model based on wetland ecology and theory that learns from plot-based experimental management results and ranks effectiveness of management actions
Model learns from observations about the degree of <i>Phragmites</i> infestation based on percent establishment and stem density	Model makes predictions using site conditions including nutrient inflows, flooding, growing season, and propagule pressure
Uncertainty in predictions for a given site might arise from lack of comparable experimental data in the PAMF network, varying interpretations of data collection procedures, or comparison to wetlands that in reality differ in some way	Uncertainty in predictions for a given site might arise from uncertainty in current understanding and completeness of ecological processes in wetlands

