**Supplementary Table S1.** Percent of course participants to correctly answer each question when completing the check-in knowledge assessment and the first and final (best) attempt of the check-out assessment in 2020 and 2021 (combined). Correct answers in multiple choice selections are indicated by italicized text.

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| --- | --- |
| Question | % Correct |
| Check-In | Check-Out (first attempt) | Check-Out (final attempt) |
| True or False? Some "weedy" aquatic plants are critical parts of natural lake ecosystems.1. *True*
2. False
 | 97.3  | 100 | 100 |
| Which of the following permits would be required for swimmer's itch control in Minnesota?1. Aquatic Invertebrate Management Permit
2. Invasive Aquatic Plant Management Permit
3. Parasite Control Permit
4. *Aquatic Plant Management Permit*
 | 5.4 | 33.0 | 67.9 |
| Which of the following is NOT an invasive species in Minnesota?1. Zebra mussels
2. Rusty crayfish
3. *Swimmer’s itch*
 | 85.7 | 99.1 | 100 |
| Which of the following is an example of an invasive emergent plant in Minnesota?1. *Flowering rush*
2. Starry stonewort
3. Curly-leaf pondweed
 | 43.8 | 77.7 | 97.3 |
| Which of the following is a tool that is implemented for rusty crayfish control in Minnesota?1. *Trapping*
2. Pesticide treatments
3. Biological control
4. Lake drawdowns
 | 28.6 | 86.6 | 93.8 |
| Which of the following organisms would most likely be controlled by an herbicide?1. Swimmer’s itch
2. *Curly-leaf pondweed*
3. Zebra mussels
4. Rusty crayfish
 | 86.6 | 91.1 | 97.3 |
| True or False? A pesticide will break down at the same rate every time it is applied to a water body.1. True
2. *False*
 | 73.2 | 99.1 | 99.1 |
| Most pesticides must be registered with the Minnesota Department of Agriculture before a federally approved product can be used within the state of Minnesota.1. *True*
2. False
 | 67.9 | 92.0 | 100 |
| Which of the following are automatically granted for pesticide treatments permitted through the Minnesota Department of Natural Resource's Aquatic Plant Management Program (APM)?1. Permission to apply the pesticide at a higher concentration than listed on the label, if listed in the APM permit
2. Permission to treat emergent vegetation outside of the area listed on the permit
3. *Coverage under Minnesota’s National Pollutant Discharge Elimination System (NPDES) general permit*
4. A private pesticide applicator’s license for individuals named on the permit
 | 25.9 | 52.7 | 80.4 |
| Match the terms below to the description that best describes them: Percent control (*c*), non-target impacts (*b*), nuisance reduction (*a*)1. Results in the negative impacts an organism may have on human use of the water body.
2. Management activities seek to minimize these.
3. Measures how much of the target organism was destroyed or removed by the management activity.
 | 67.0 | 92.0 | 95.5 |
| Which of the following terms describes the process of a pesticide being broken down by exposure to light?1. *Photolysis*
2. Hydrolysis
3. Microbial breakdown
 | 75.9 | 97.3 | 100 |
| At which invasion stage do lake managers have the best chance at eliminating a population of an invasive species?1. Prevention
2. *Early detection*
3. Management
 | 60.7 | 30.4 | 75.9 |
| Which of the following are potential benefits of a well-planned aquatic invasive species management program?1. Reduced impacts to the ecosystem
2. Reduced annual costs associated with management activities
3. Fewer impacts to recreational uses of a water body
4. *All of the above*
 | 98.2 | 100 | 100 |
| Match the terms below with the definitions that best describe them: Selective herbicide (*c*), contact herbicide (*d*), systemic herbicide (*a*), mode of action (*b*), broad-spectrum pesticide (*e*)1. A type of herbicide that is transported throughout the plant through the plant’s vasculature.
2. The mechanism or process by which a pesticide works.
3. A pesticide that only targets a specific organism or group of organisms.
4. A type of herbicide that only impacts the parts of the plant that are directly exposed to the herbicide.
5. A pesticide that impacts many different groups of organisms.
 | 80.4 | 97.3 | 99.1 |
| Which of the following is NOT a precaution to take to ensure the least risk to the environment and human health when applying an aquatic pesticide?1. Wearing at least the minimum personal protective equipment outlined on the pesticide label
2. *Guessing on the water volume in the treatment area from the data recorded 3 years prior*
3. Evaluating various control methods to select which will best achieve the desired results
4. Never exceeding the treatment frequency listed on the pesticide label
 | 85.7 | 97.3 | 99.1 |
| Which agency is responsible for licensing aquatic pesticide applicators in Minnesota?1. United States Environmental Protection Agency
2. Minnesota Pollution Control Agency
3. Minnesota Department of Natural Resources
4. *Minnesota Department of Agriculture*
 | 21.4 | 62.5 | 84.82 |
| True or False? Commercial pesticide applicators are required to provide their clients a copy of the pesticide application record.1. *True*
2. False
 | 77.7 | 99.1 | 100 |
| Which of the following species have been effectively controlled using physical removal?1. Zebra mussels
2. Starry stonewort
3. Common carp
4. *All of the above*
 | 18.8 | 42.9 | 79.5 |
| Which of the following is NOT something we have learned from robust, long-term monitoring of curly-leaf pondweed management?1. *Reduced snow cover tends to reduce curly-leaf pondweed growth*
2. Managers may wish to plan on treating for curly-leaf pondweed annually for multiple years for effective long-term management
3. Ice thickness does not impact success of curly-leaf pondweed treatments
4. Data sharing has led to new knowledge on the outcomes of curly-leaf pondweed management
 | 32.1 | 70.5 | 92.0 |
| Which of the following activities would require an Aquatic Plant Management Permit from MN DNR?1. *Using 2,4-D to maintain a swimming area within 150 feet of your own shoreline property*
2. Hand pulling lily pads to create a 15 foot access channel from your dock to open water
3. Using a weed rake to clear submersed vegetation from a 15 foot by 25 foot area along your shoreline where your property extends for a total of 50 feet of shoreline
4. *Using copper sulfate to control swimmer’s itch along your shoreline*
 | 17.0 | 46.4 | 71.4 |