["--" = not selected; "x” = selected]

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Action | Description | Lock and dam | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 5A | 6 | 7 | 8 | 9 | 14 | 15 | 19 |
| Strategy 1: No action | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No action | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Agency (some removal) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No habitat management | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No investment | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No monitoring | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Engage with the public to reduce spread | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No outreach | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Partner with agencies on public outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Strategy 2: Current Strategy | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Temporary |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Temporary |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | -- |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | x | x | x | x | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | -- | -- | -- | -- | x | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | -- | x | -- | -- | x | x | x | x | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | x | x | x | x | -- | -- | -- | x |
| No prevention or outreach | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 3: Unconstrained | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | x | -- | x | x | -- | -- | -- | -- | -- | x | x | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | Permanent |
| No deterrent | -- |  | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | x | -- | x | x | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | -- | x | -- | -- | x | x | x | x | x | x | x | x |
| Dam removal | Remove dam | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | x | -- | x | x | -- | -- | -- | -- | -- | x | x | x |
| Minimize invasive carp upstream passage through spillway gates | -- | x | -- | x | x | -- | -- | -- | -- | -- | x | x | x |
| No action | x | -- | x | -- | -- | x | x | x | x | x | -- | -- | -- |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Agency (some removal) | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No removal | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Implement new or addition native fish habitat restoration | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Protect native predators to support invasive carp management objectives | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development | Agency lead removal (2 pools/year) | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Develop spillway gates deterrents | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Native and invasive fish passage timing overlap | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Engage in early life history monitoring | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate regulations among agencies | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate among partners on early life history monitoring | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Maximize influence on downstream management to align with Minnesota priorities | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Provide resources to partners for interjurisdictional coordination | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No prevention or coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 4: Targeted Investment | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 5: Targeted Investment + Deterrent at Lock and Dam 5 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | x | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | x | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | -- | x | x | x | x | x | x | x | -- |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | x | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | -- | x | x | x | x | x | x | x |  |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or outreach | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 6: Targeted Investment + Deterrent at Lock and Dam 8 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | x | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | x | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | -- | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x |  |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 7: Targeted Investment + Deterrents at Lock and Dams 4 and 5 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | -- | -- | x | x | x | x | x | x | x | -- |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | x | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | x | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | x | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 8: Targeted Investment + Deterrents at Lock and Dams 5 and 8 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | -- | x | x | x | -- | x | x | x | -- |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | x | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
|  | No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
|  | No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | x | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 9: Targeted Investment + Research and Development | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | -- | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x |  |  |  |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Develop spillway gates deterrents | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Engage in early life history monitoring | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in monitoring movements with telemetry | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate regulations among agencies | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Partner with agencies on public outreach | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| No prevention or outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 10: Targeted Investment + Research and Development + Deterrent at Lock and Dam 5 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | -- | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- |  |  |  |  |  |  |  |  | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Native and invasive fish passage timing overlap | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach |  | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 11: Targeted Investment + Maximize Removal | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x |  |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 12: Increase resiliency | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | x | x | -- | -- | x | x | -- | -- | x | x | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x |  | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- |  |  |  |  |  |  |  |  | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- |  | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 13: Targeted Investment + Deterrent at Lock and Dam 15 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | -- | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 14: Maximize removal + Research and Development | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | x | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Native and invasive fish passage timing overlap | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 15: Maximize removal + Deterrent at Lock and Dam 5 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | x | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- |  | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Efficient capture techniques below the deterrent | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
|  | No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach |  | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 16: Maximize removal + Deterrent at Lock and Dam 8 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | -- | -- | -- | -- | x | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or outreach | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 17: Maximize removal + Deterrents at Lock and Dams 4 and 5 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x |  |  |  |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Efficient capture techniques below the deterrent | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of disposal approaches | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Invest in research on deterrent effectiveness | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Strategy 18: Maximize removal + Deterrents at Lock and Dams 5 and 8 | | | | | | | | | | | | | | |
| Deterrent siting | Implement any deterrent type | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | Permanent |
| Consider pathway dependent deterrents (e.g., spillway, lock) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Permanent |
| No deterrent | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Deterrent operation | Seasonal deterrent operation to account for lock closure in the winter due to ice and ice flows and seasonal operations to allow native fish passage if timing is earlier than invasive carp | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Not applicable | x | x | x | x | x | x | x | x | x | x | x | x | -- |
| Dam removal | Remove dam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No dam removal | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Facilitate native fish and mussel movement | Maximize native fish passage at lock and dam locations | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimize invasive carp upstream passage through spillway gates | -- | -- | -- | -- | x | -- | -- | -- | x | -- | -- | -- | -- |
| No action | x | x | x | x | -- | x | x | x | -- | x | x | x | x |
| Targeted removal at a rate of 2 pools per year | Perform targeted removals once an invasive carp density threshold is met | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Incentivized harvest | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Contracted fishing | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| Agency (some removal) | -- | x | x | x | x | x | x | x | x | -- | -- | -- | -- |
| No removal | x | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x | x |
| Native habitat management | Native habitat restoration (ongoing work) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Implement new or addition native fish habitat restoration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support invasive carp management objectives | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Protect native predators to support native fish objectives | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| No habitat management | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Invest in research and development | Agency lead removal (2 pools/year) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stock Native Predators | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Research and quantify invasive carp recruitment dynamics | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research and development of efficient capture techniques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Efficient capture techniques below the deterrent | x | x | x | x | x | x | x | x | x | x |  |  |  |
| Invest in research and development of disposal approaches | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in research on deterrent effectiveness | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Invest in research and development of selective fish passage techniques | -- | -- | -- | x | x | -- | -- | -- | -- | -- | -- | -- | -- |
| Evaluate reproduction potential for upstream pools using FluEGG | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Develop spillway gates deterrents | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Identify inter basin connections and carp invasion risk to Minnesota waters | -- | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Invest in tew technology development (Pheromones, Gene drive, Spawning disruption) | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Native and invasive fish passage timing overlap | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| No investment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x |
| Invasive carp monitoring | Monitor invasive carp catch in commercial fisheries and contracted removals | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Engage in early life history monitoring | -- | -- | -- | -- | -- | x | -- | -- | x | -- | -- | -- | -- |
| Engage in monitoring movements with telemetry | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Public outreach | Outreach to Increase reporting in MN waters by the pubic | x | x | x | x | x | x | x | x | x | x | -- | -- | -- |
| Engage with the public to reduce spread | x | x | x | x | x | x | x | x | x | x | x | x | x |
| No outreach | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Prevention and coordination | Provide 'resources' (e.g., tags; receivers; VR2, VR100) to partners to maximize benefits of ongoing efforts | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate regulations among agencies | -- | -- | x | x | x | x | x | x | x | x | x | x | x |
| Partner with agencies on public outreach | -- | x | x | x | x | x | x | x | x | x | x | x | x |
| Coordinate with partners to implement actions at the invasion front | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Coordinate among partners on early life history monitoring | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | -- |
| Maximize influence on downstream management to align with Minnesota priorities | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | x | x | x |
| Provide resources to partners for interjurisdictional coordination | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| No prevention or coordination | x | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |