Lake Tapps Integrated Aquatic Vegetation Management Plan – Treatment Scenarios

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Recap of March 31st Public Meeting

- Problem Overview
- Invasive and Native Plants of Concern
- Management Options
  - No Action
  - ➢ Environmental Manipulation
  - Biocontrol
  - ➢ Manual Control
  - Mechanical Control
  - ➢ Chemical Control
- Goal: Eradication

➢ Management Options being carried forward

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Management Goal: Eradication - EWM

- Multi-year approach
- Aggressive management actions
- Dedicated funding
- Strong community support
- Enforceable prevention measures
- Diligent monitoring for satellite populations (or pioneering colonies)
- Regular reviews of management options
- Adaptive and sustainable program
- Other non-native species control

Environmental Manipulation

- Water level control (drawdown)
- Pros
  - Inexpensive for non-hydropower generating systems
- Cons
  - Sediment compaction
  - Difficult to establish native plants
  - Future extensive drawdowns may be limited and variable
- Applicability to Lake Tapps
  - Insufficient dry and cold conditions
  - Use in combination with other tools

Manual Control

- Bottom Barrier, hand-pulling and hand-cutting
- Pros
  - Public perception (visible results and perceived less expensive, but really is more costly)
- Cons
  - Labor intensive; not as effective
  - If not conducted properly can lead to expansion
- Applicability to Lake Tapps
  - Small-scale, post-treatment follow-up
  - Use in combination with other tools

Chemical Control

- Products licensed by EPA and approved for use by the State Department of Ecology
- Formulated for applications in or around water
- Pros
  - Aggressive
  - Whole lake or spot treatments
- Cons
  - Public perception
- Applicability to Lake Tapps
  - Can be use in combination with other tools


Photo credit: John Madsen


Photo credit: Terry McNabb, AquaTechnex

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Treatment Approaches: Whole Lake

- Entire lake volume treated
- Option(s): herbicide, water level drawdown
- Pros: aggressive
- Cons: aggressive, fewer products approved, reduced plant selectivity
- Not appropriate for Lake Tapps

Treatment Approaches: Partial Lake

- Large area uniformly treated (where plants are concentrated)
- Option(s): herbicide, some diver hand-pulling, water level drawdown
- Pros: reduced product quantity, increased plant selectivity, increased public perception
- Cons: repeated treatments
- Appropriate for Lake Tapps


Photo credit: Terry McNabb, AquaTechnex

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Treatment Approaches: Targeted Area

- Specific areas (bays, boat launches, swim areas, docks)
- Option(s): hand-pulling, bottom-barriers, herbicide
- Pros: public perception, reduced cost, avoids non-target plants
- Cons: selecting target areas, may not lead to eradication
- Appropriate for Lake Tapps, but may not accomplish goal of eradication

Treatment Approaches: Partial Lake + Targeted Areas

- A combination of treatment options
- Partial treatments initially
- Targeted areas as plant coverage diminishes

Lake Tapps Shoreline and Treatment Area

15 ft. Depth Contour

550 acres

- **<u>Partial Lake</u> Option**
- **Draft treatment areas to be refined with additional field data**
- **Additional mapping will occur when plants re-appear**

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Aquatic Herbicides Approved for Use in WA to Control Eurasian Watermilfoil

Active Ingredient	Trade Names	Selectivity/Notes	Management Uses and Considerations	Water Use Restrictions (Label) and Advisories (Ecology)
2,4-D	Navigate® (granular) Aqua-Kleen® (granular) DMA*4IVM® (liquid)	Selective for broad-leaved plants (i.e., milfoil); fast-acting; destroys entire plant	Both liquid and granular appropriate for spot treatments; may selectively control native plants at label rate; liquid formulation more effective	Label: For drinking water, concentration must be < 70 ppb; for irrigation, concentration should be < 100 ppb; granular formulation may not be used in waters with threatened or endangered salmon runs
Endothall	Aquathol® K (liquid) Aquathol® Super K (granular)	Non-selective; fast-acting; destroys vegetative portion of plant (e.g., does not kill roots)	Short-term control; appropriate for spot treatment	Label: 3 day fish consumption; irrigation and stock watering restrictions 7-14 days^ Ecology: 24 hour swimming advisory
Fluridone	Sonar® AS (liquid) Sonar® SRP (granular) Sonar® PR (granular) Avast!® SC (liquid) Whitecap® (liquid)	Non-selective; slow acting; inhibits formation of carotene (a protective plant pigment)	Appropriate for areas of low water exchange; used for whole-lake treatment or in isolated bays; not appropriate for spot treatment < 5 acres	Label: Irrigation should be avoided for 30 days; no drinking, fishing, swimming, or livestock/pet consumption restrictions; potable water setback may be required^
Triclopyr - TEA	Renovate® 3 (liquid) Renovate® OTF (granular)	Selective for broad-leaved plants (i.e., milfoil); fast-acting; destroys entire plant	Appropriate for spot and whole-lake treatments	Label: do not use for irrigation for 120 days or when <1 ppb^; potable water setback may be required^; no fishing, swimming, or livestock/pet consumption restrictions Ecology: 12 hour swimming restriction
Diquat	Reward® (liquid)	Non-selective; fast-acting; destroys vegetative portion of plant (e.g., does not kill roots)	Short-term control; appropriate for spot treatment; efficacy limited in turbid water and dense algae blooms	Label: 1-3 days* drinking, 0 days fishing and swimming, 1 day livestock/domestic animal consumption, 1-3 days irrigation for turf and landscape ornamentals, 5 days food crops and production ornamentals

* Ranges in days determined by application rate, see label for details
^ Restrictions depend upon specific use, season, or application rate

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Scenario 1: Partial Lake (5-Year Program)

Year	Action (Initial Approach)
1	**Summer:** Partial lake application with liquid fluridone; apply 2 to 4 "bump" applications to maintain desired concentration for at least 45 days. Implement prevention efforts to eliminate introduction of plant propagules. **Fall:** Survey to inform Year 2 treatment; hand-pull areas less than < 5 acres; normal water level drawdown
2	**Summer:** Application of granular fluridone (isolated bays) or granular triclopyr (exposed shorelines) to 2 acres surrounding infested areas identified in Year 1 fall survey; apply 2 to 4 "bump" applications to maintain desired concentration for at least 45 days. Increase prevention efforts to eliminate introduction of plant propagules. **Fall:** Deploy divers for hand removal of plants in areas less than 5 acres and mark areas greater than 5 acres for herbicide application in Year 3; normal water level drawdown
3	**Summer:** Same as above and increase use of diver hand-pulling to eliminate satellite infestations Further increase and enforce prevention efforts to eliminate introduction of plant propagules. **Fall:** Same as above
4	**Summer:** Spot application of triclopyr to areas greater than 5 acres; deploy divers for hand removal of plants in areas less than 5 acres. Continue to enforce prevention efforts to eliminate introduction of plant propagules. **Fall:** Same as above
5	**Summer:** Same as above Continue to enforce prevention efforts to eliminate introduction of plant propagules. **Fall:** Same as above

Scenario 2: Partial Lake + Targeted Areas
(5-Year program)

Year	Action (Combination Approach for Re-appearance of Isolated Patches)
1	Summer: Partial lake application with fluridone; apply 2 to 4 "bump" applications to maintain desired concentration for at least 45 days; targeted application of diquat to high use areas (e.g. navigation lanes) Implement prevention efforts to eliminate introduction of plant propagules. Fall: Survey to inform Year 2 treatment; hand-pull areas less than < 5 acres; normal water level drawdown
2	Summer: Application of granular fluridone (isolated bays) or granular triclopyr (exposed shorelines) to 2 acres surrounding infested areas identified in Year 1 fall survey; apply 2 to 4 "bump" applications to maintain desired concentration for at least 45 days; targeted application of diquat to high use areas (e.g. navigation lanes) Increase prevention efforts to eliminate introduction of plant propagules. Fall: Deploy divers for hand removal of plants in areas less than 5 acres and mark areas greater than 5 acres for herbicide application in Year 3; normal water level drawdown
3	Summer: Same as above. Further increase and enforce prevention efforts to eliminate introduction of plant propagules. Fall: Same as above
4	Summer: Spot application of triclopyr to areas greater than 5 acres; deploy divers for hand removal of plants in areas less than 5 acres. Continue to enforce prevention efforts to eliminate introduction of plant propagules. Fall: Same as above
5	Summer: Same as above Continue to enforce prevention efforts to eliminate introduction of plant propagules. Fall: Same as above

Management Plan Draft Schedule

	Feb '10	Mar '10	Apr '10	May '10	June '10	July/ Aug '10
Vegetation Mapping				x		
Plant Index				x		
Public Meetings		31st		11th	10th	
Draft Plan Developed (IAVMP)				x		
Final Plan Approved (IAVMP)					x	
Initial Implementation						x

Note: Ecology Permit for chemical application can begin immediately (allow 60 days for review) .

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Questions?