


Virginia's Wetland Monitoring and Assessment Strategy



National Wetland Monitoring and Assessment Work Group
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Background

- VA's nontidal wetlands program
 - no net loss of wetland acreage and function through permitted impacts.
- Status of wetland resources
 - location and extent of wetlands in watersheds
 - knowledge of the quality of these wetlands
- Functions of impacted wetlands must be evaluated to assess whether functions are being compensated

Background

- As signatories to the Chesapeake Bay 2000 Agreement, VA has agreed to...
 - *“(i) achieve no net loss of existing wetland acreage and function through regulatory programs;*
 - *(ii) achieve net wetland resource gain through wetland restoration; and*
 - *(iii) assist local governments and community groups with development of wetland preservation plans as part of integrated locally based watershed planning.”*

Virginia's Wetland Monitoring & Assessment Goal

- Develop a long-term implementation plan for a wetland monitoring and assessment program that supports VA's wetland protection programs.
- Framework for an ongoing assessment
 - Status of VA's wetland resources
 - Success of regulatory and voluntary programs.

Virginia's Wetland Monitoring & Assessment Strategy

- Establish baseline conditions in various broad contexts (i.e., land use, watershed, and wetland type) to guide:
 - management decisions regarding restoration efforts,
 - programmatic compensatory mitigation,
 - integration with overall water quality standards

- Strategy to be coordinated with and become an integral part of VA's comprehensive water quality monitoring program strategy.

Virginia's Top 10 Elements of Wetland Monitoring & Assessment¹

1. Monitoring Program Strategy
2. Monitoring Program Objectives
3. Monitoring Design
4. Core & Supplemental Water Quality Indicators
5. Quality Assurance
6. Data Management
7. Data Analysis/Assessment
8. Reporting
9. Programmatic Evaluation
10. General Support and Infrastructure Planning

¹ *Elements of a State Water Monitoring and Assessment Program*, EPA 841-B-03-003, March 2003.

Monitoring Objectives

- Support regulatory decision-making
 - Evaluation of project impacts during permitting
- Reporting of wetland conditions
 - i.e., CWA 305(b) reports
- Information for policy/program development
 - Evaluate performance of compensation efforts
 - Evaluate cumulative impact relative to ambient ecological conditions

Monitoring Design

- 3-tiered approach to wetlands sampling
 - Internal and external factors
- Probability design in a GIS framework to meet the full range of decision needs.
- The probability-based design includes making statistically valid inferences about the condition of all State water types over time.

Core and Supplemental Water Quality Indicators

- Evaluate the 6 WQ designated uses for applicability to wetland conditions.
- Other designated uses of wetlands will be considered.
- Goal of developing wetland quality standards as narrative use criteria.
- Suite of core and supplemental indicators will be evaluated to assess whether a particular wetland is meeting the standard.

Quality Assurance

- Quality assurance project plans (QAPP) are established, maintained, and peer reviewed in accordance with EPA policy.
- Ensures scientific validity of monitoring activities.
- Ensures that State reporting requirements are met.
- EPA approved QAPP for Level 1 and initial Level 2 assessment studies

Data Management

- Accessible electronic data system with interactive GIS framework to manage and store data.
- VIMS servers.
- DEQ staff and public access via web browsers.
- DEQ's database system CEDS will provide link and possible integration.
- Future data transfer directly or indirectly to EPA's STORET system or other systems.

Data Analysis/Assessment

- Data analyzed by wetland type and watershed with specific scores for habitat & water quality.
- Other spatial/temporal analyses to make comparisons or correlate wetland quality to other factors.
- Methodology includes criteria for compiling, analyzing, and integrating other readily available and existing information (e.g., volunteer monitoring data, discharge monitoring reports).

Programmatic Evaluation

- DEQ to conduct periodic reviews
 - Progress towards milestones
 - How info is used to support management decisions
- October 2007 - performance measures to assess implementation of strategy
- Conduct programmatic evaluations on a biannual basis (mid-course corrections as needed)

General Support and Infrastructure Planning

- Identify resources needed to fully implement monitoring program strategy (state, federal, grant, private, NGOs).
 - Assessment will describe funding, staff, training, laboratory resources, and upcoming improvements.

In a nutshell...

- 3 level protocol developed (3-4 years): Designed to generate a nested data set, with common minimum data set available for all identified wetlands in the state, and more extensive information available for selected subsets of wetlands and watersheds.
 - Level 1 – Landscape (GIS)
 - Level 2 – Rapid Assessment (Stressor list)
 - Level 3 – Validation (IBI or other models)
- Trying to determine a generalized condition for wetlands in Virginia
- Developing a probabilistic model to predict wetland condition in the future
- Use for cumulative impact assessment, possibly for functional assessment, possibly for mitigation uses

Level 1 Assessment (Remote Sensing)

- Create baseline maps
 - NWI Maps
 - LandSAT Photos
 - Land Cover Maps
- Use GIS to create a geospatial database based on 14-digit HUC
- Start in Coastal Plain and move west
- Completed in 2005

Level 2 Assessment (Ground Truthing)

- Stratified random sample of sites identified in Level 1
- 3 Broad wetland types: PFO, PSS, PEM
- Evaluate each site using stressor checklist on Palm Pilot platform
- Download field data to VIMS computers

Level II Onsite Assessment. Randomly selected wetlands, Stratified by HUC and general type (Forested, scrub/shrub, emergent).

Stressors Assessed with 30m radius and 100m radius of sample point (total assessment area = 3.12 ha).

Ditch/Drain

Dam/Weir/Dike

Filling/grading

Dredging/Excavation

Stormwater input/culverts/input ditch

≥4 lane paved road, 2lane paved, 1 lane paved, gravel, dirt, railroad

Parking lot (large residential or commercial

Active construction

Active agriculture

Mowing

Brush cutting

Active timber harvesting (within 1 year)

Active timber harvesting (within 1 to 5 years)

Active clear cutting (within 1 to 5 years)

Active clear cutting (within 1 year)

Unfenced cattle access

Excess Herbivory

Herbicide application (lawns, right of way maintenance)

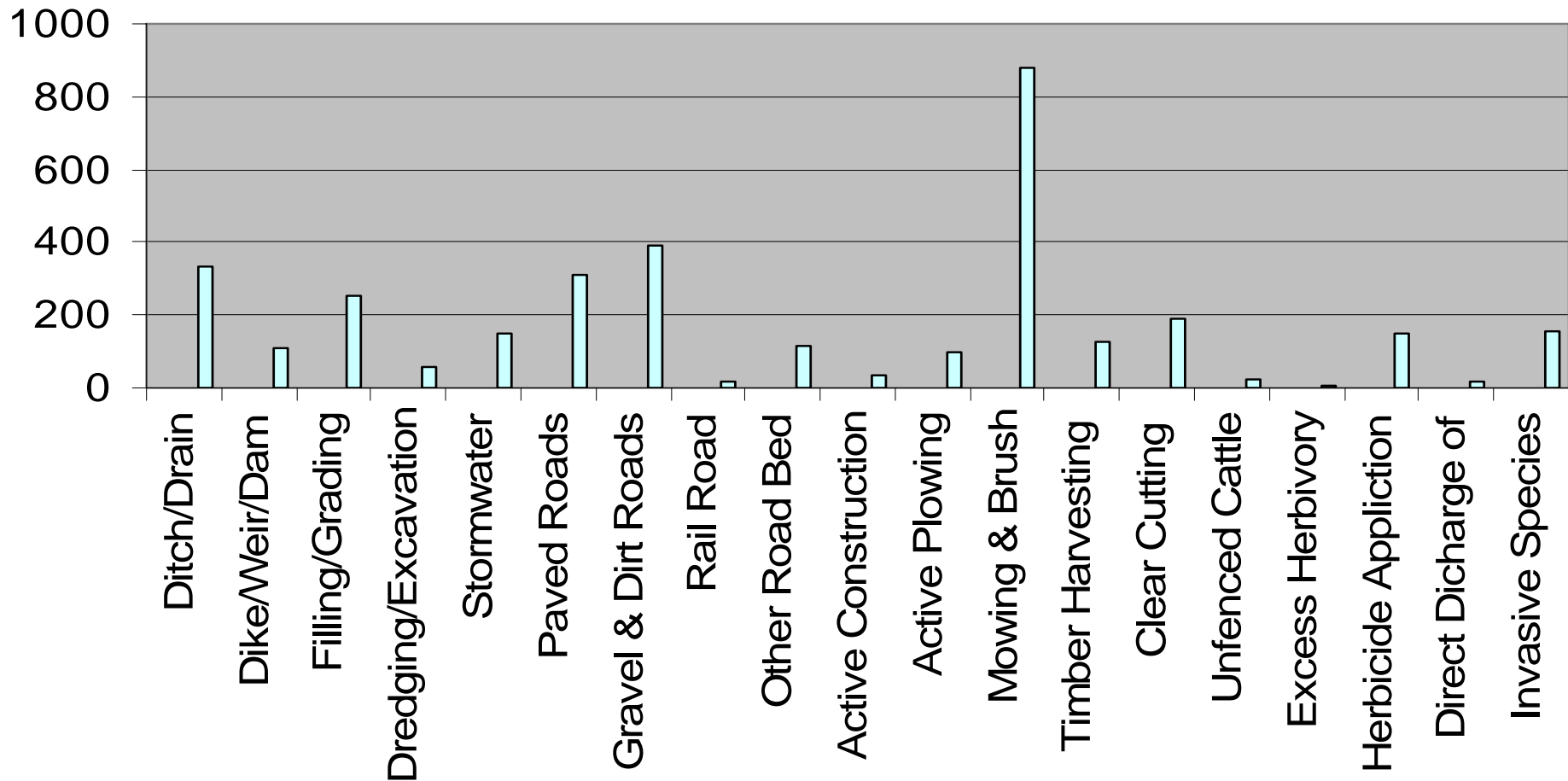
Direct discharge of toxics

Invasive species



Preliminary Data-Level 2

Level II Stressor Frequency



Level 3 Assessment (Validation)

- Validates Levels 1 & 2
- A smaller subset of Level 2 sites
- Very detailed field work
 - Using Natural Heritage & DGIF data
 - IBI's and other habitat assessment methods
- Probably 25-30 sites statewide
- Start in Coastal Plain and move west

Implementation

- Once monitoring & assessment data is collected it will be used to:
 - Evaluate proposed wetland impacts during permit review as part of a regulatory program;
 - Evaluate performance of wetland restoration and compensatory wetland mitigation in replacing wetland acreage and function; and
 - Evaluate cumulative wetland impacts and restoration efforts in watersheds relative to ambient ecological conditions.

Permit Applications

- Evaluate proposed wetland impacts during permit review as part of a regulatory program
 - How many wetland impacts have already been permitted in the watershed?
 - What is the relative quality of remaining wetlands in the watershed?
 - Will permitted impacts degrade the remaining wetland's quality?
 - How is the required compensatory mitigation performing in relation to those impacted functions?
 - This may lead us to adjust compensation ratios to assure that we are meeting a minimum of no net loss

Performance

- Evaluate performance of wetland restoration and compensatory wetland mitigation in replacing wetland acreage and function
 - Replacing quantity and quality?
 - May consider narrative wetland quality standard, in addition to existing use standard, if it would lead to further resource protection
 - Once wetland quality standards are developed, evaluate a suite of core and supplemental indicators to assess whether or not a particular wetland is meeting the standard.

Cumulative Impacts

- Evaluate cumulative wetland impacts and restoration efforts in watersheds relative to ambient ecological conditions
 - May result in identifying exceptional value wetlands with different permitting requirements
 - Can be used to target degraded wetlands for restoration projects.

Summary

The overarching goal of our M & A strategy:

- Develop a long-term implementation plan for a wetland monitoring and assessment program that protects the physical, chemical, and biological integrity of the Commonwealth's water resources;
- Allow for both general reporting on status/trends, and provide for more intense analysis of select watersheds that will be used as part of Virginia's 305(b) report; and
- Evaluate the effectiveness of regulatory and voluntary programs.

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A photograph of a swampy forest. The ground is dark and saturated with water, reflecting the surrounding greenery. Numerous thin, vertical tree trunks are scattered throughout the scene. In the foreground, a large tree trunk is heavily covered in bright green moss. The overall atmosphere is lush and damp.

Questions?

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