

WETLANDS 2000 AND BEYOND

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Presented to the West Virginia Academy of
Sciences, Spring 2000

Some Accomplishments in Wetland Conservation

- Vast reduction in wetland losses
 - Federal, state, and local regulations
 - Reduced gov't-sponsored drainage
- Improvements in wetland identification methods
- Better information on wetlands
 - Mapping/Digital Data (90/42 US; 34/13 AK)
 - Wetlands Interactive Mapper
 - Reports/Books/Public Information Booklets

Some Accomplishments (cont'd)

- Increased wetland acquisition
- No-net wetland loss/net gain goals
 - Federal: By 2005 = +100,000 acres/yr
- Accelerated wetland restoration
- Establishment of best management practices (forestry, agriculture, stormwater mgmt, etc.)
- More environmentally educated and concerned public

Where to Go from Here?

- Improve wetland regulatory programs
 - Increase enforcement and litigation
 - Develop quality assurance steps to ensure accurate wetland delineations
 - Expand activities covered by regulations (esp. drainage and individual permits)
 - Perform formal environmental audits of such programs
- Use current science in wetland determinations
 - Implement findings of National Research Council (1995)
 - Develop technical standards to achieve consistency in wetland identification for regulatory purposes

Where to Go from Here?

(cont'd)

- More tax incentives for wetland preservation
- Improve definition of what constitutes wetland restoration vs. enhancement
- Improve accounting of wetland restoration (re: net gain or no-net loss)
- Focus wetland restoration to address watershed or wildlife habitat problems
- Develop a Wetland Conservation Plan for watersheds, states, regions, and the Nation

**WETLAND
CONSERVATION
PLAN...A GRAND PLAN
(for wetlands at least)**

Potential Elements of a Wetland Conservation Plan

- Characterization of existing wetland resources
- Wetland trends (plus current threats and hotspots)
- Preliminary functional assessment
- Potential wetland restoration sites (couple with “Watershed-deficits”)
- Condition of wetland/stream buffers (restoration sites)
- Ecological integrity index of watersheds
- Specific goals/objectives to improve wetlands

Step 1. Wetland Characterization

Wetland Characterization - Existing Data

- National Wetlands Inventory maps
 - Conservative in most areas; many areas have dated maps
 - Vegetation type, hydrology, and other modifiers
 - Many maps available in digital form (42%-US)
- State wetland maps
- County soil survey reports
 - Locations of Hydric Soil Map Units
- Local wetland maps (county/town)
- Wetland trends data

Building a Comprehensive Wetland Database

- Update wetland maps and digital database
 - Integrate with other sources (including digital databases such as soils data where available)
- Expand the wetland database
 - Hydrogeomorphic-type descriptors to mapped wetlands
 - Landscape position, landform, and water flow path
 - Other information:
 - potential wetland restoration sites
 - wetland and stream buffers

Wetland Characterization - Products -

- Updated wetland maps
- Digital wetland database (GIS applications)
- Report (possibly including wetland trends information)

Wetland Characterization - Report

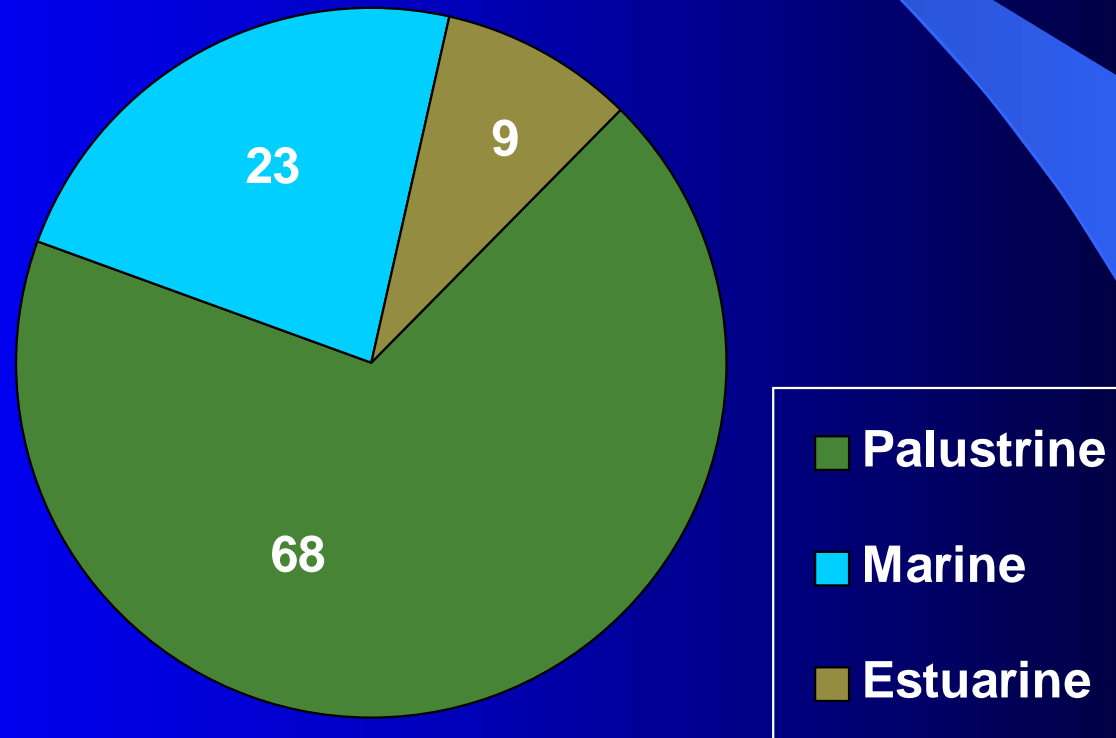
Maps, stats, and figures addressing:

- NWI types
 - Marine, Estuarine, Lacustrine, Palustrine, and Riverine
 - Emergent, Scrub-shrub, Forested, Aquatic Bed, etc.
- HGM types
 - Landscape Position (Lotic, Lentic, Terrene, Est., + Mar.)
 - Landform (Basin, Flat, Slope, Floodplain, Fringe, Island)
 - Water Flow Path (Throughflow, Inflow, Outflow, Isolated)
- Historical information on wetland trends (optional)

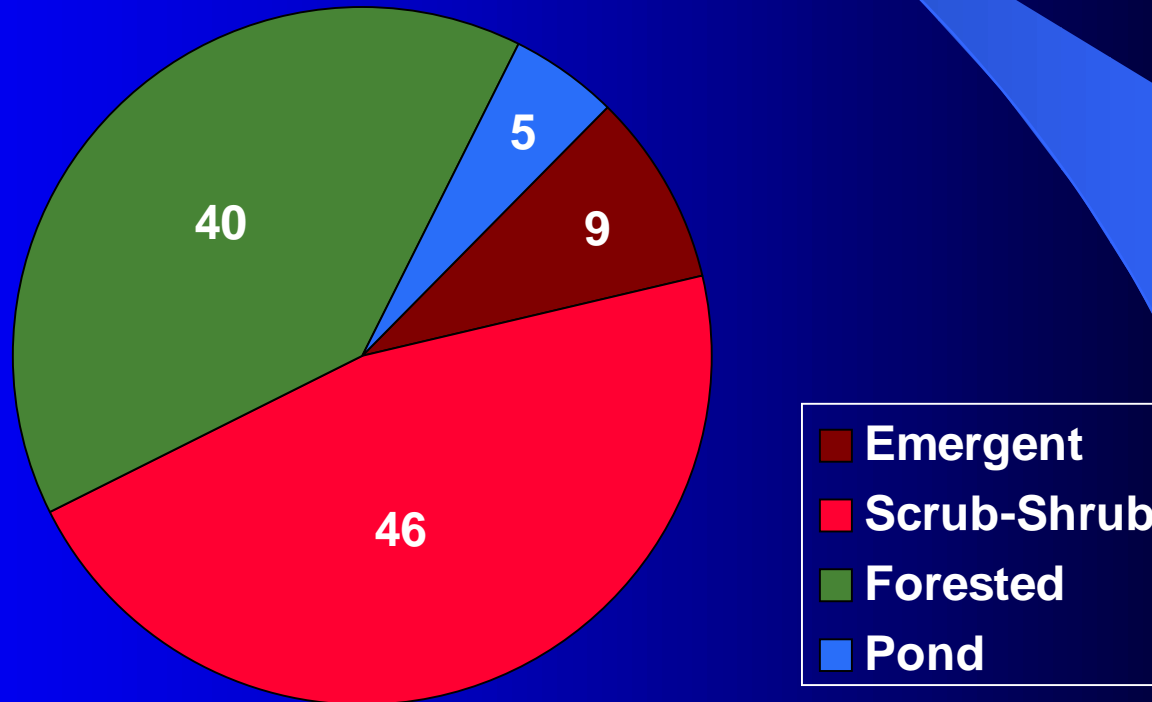
Casco Bay Watershed - Wetland Characterization

Casco Bay Watershed

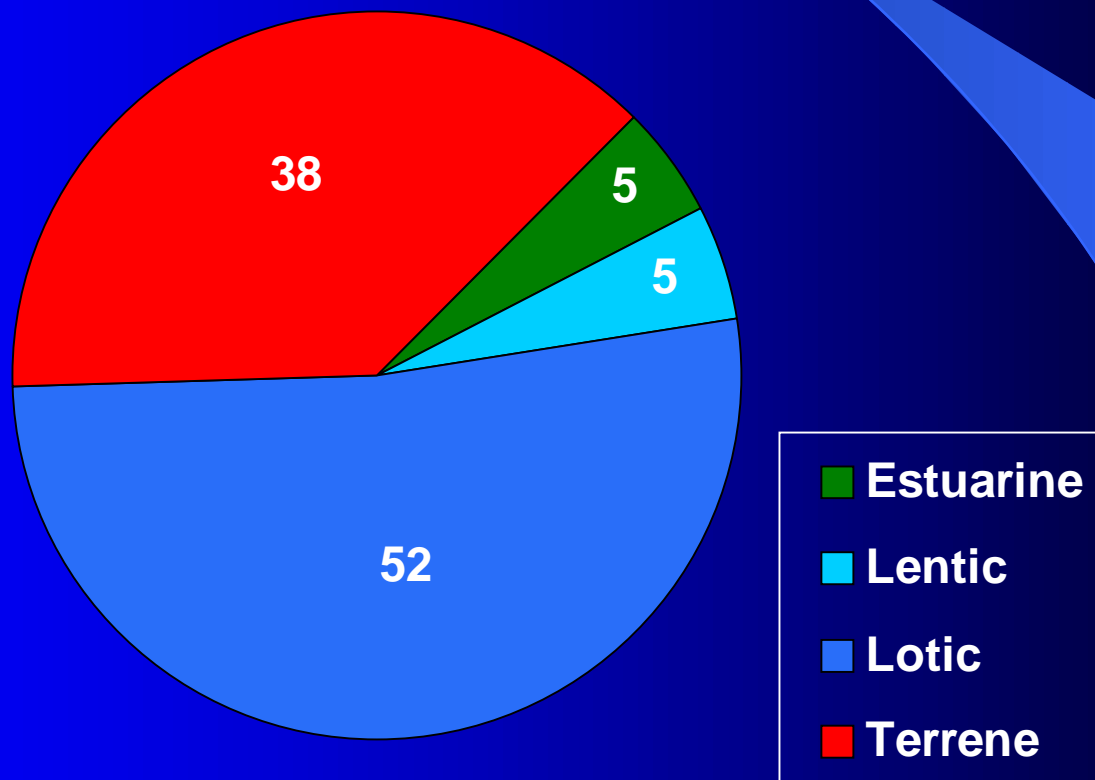
Wetlands: % by NWI Type



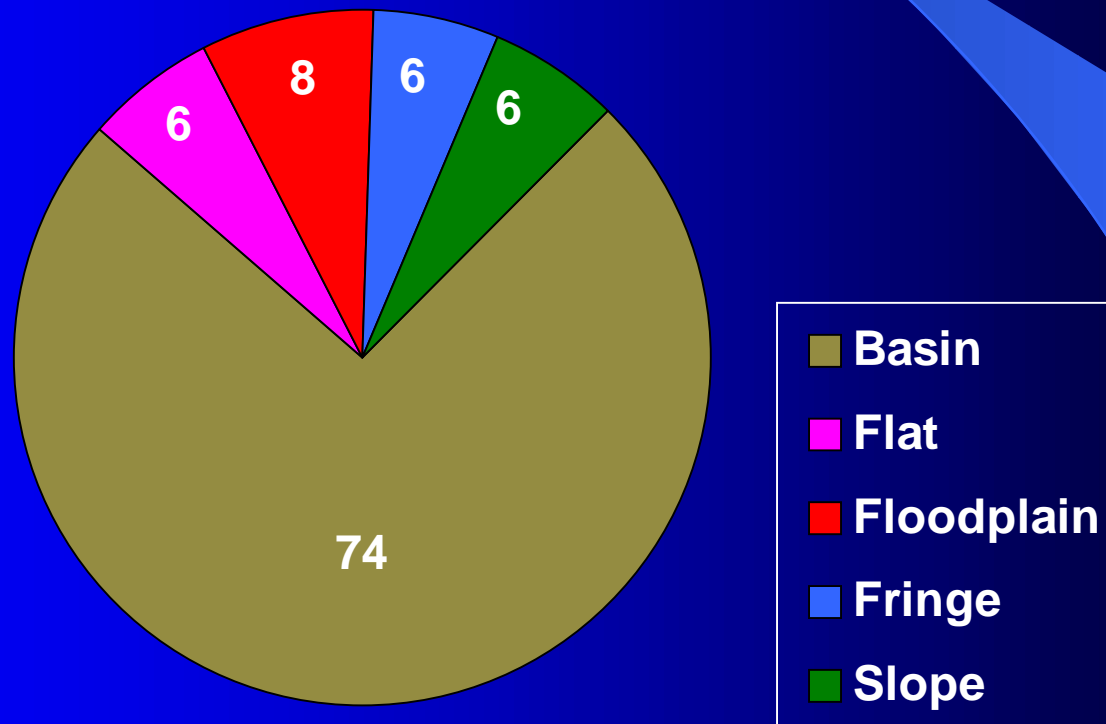
Casco Bay Watershed Palustrine Wetlands: % by Class



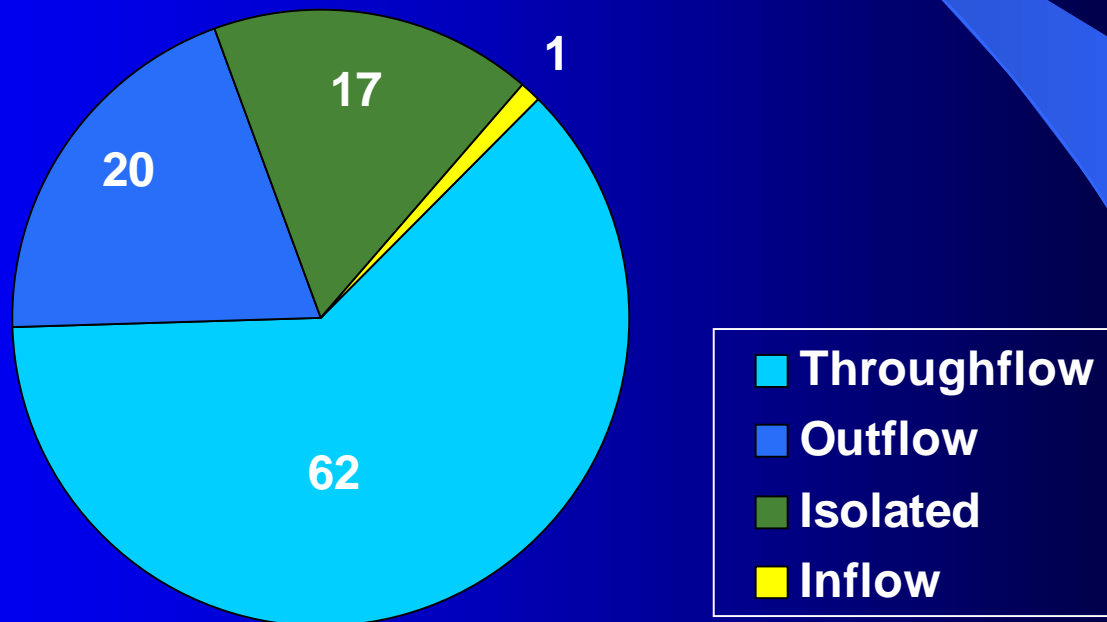
Casco Bay Watershed Wetlands: % by Landscape Position



Casco Bay Watershed Wetlands: % by Landform Type



Casco Bay Watershed Wetlands: % by Water Flow Path



The background is a dark blue gradient that transitions to a lighter blue at the bottom right. A thin, light blue curved line starts from the left edge and curves downwards towards the bottom right corner.

Step 2. Preliminary Assessment of Wetland Functions

Preliminary Assessment of Wetland Functions

- Use characterization/wetland digital database to identify wetlands of potential significance for performing certain functions

Coupling Wetland Characteristics with Functions

- Determine functions of interest
 - Surface Water Detention
 - Streamflow Maintenance
 - Nutrient Cycling
 - Sediment/Particulate Retention
 - Shoreline Stabilization
 - Provision of Fish and Wildlife Habitat
 - Maintain Biodiversity
- Develop protocols based on:
 - Knowledge of wetland functions (literature/HGM)
 - Knowledge of the watershed (local experts)

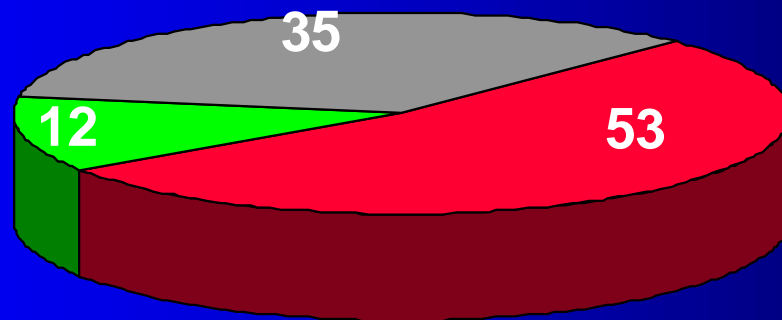
The Process

- Create digital wetland database
 - Expand existing NWI data by adding HGM-type descriptors
 - Draft protocols that would identify wetlands of potential significance for performing different functions
- Scientific peer review of protocols
- Field review
- Perform analysis and prepare draft report
- Peer review of analysis/draft report
- Final analysis/publish final report with maps

Surface Water Detention

- Wetlands along waterbodies - subject to periodic flooding
 - lotic wetlands (high potential)
 - terrene basin wetlands (possible local significance)

Casco Bay Watershed Wetlands: Surface Water Detention

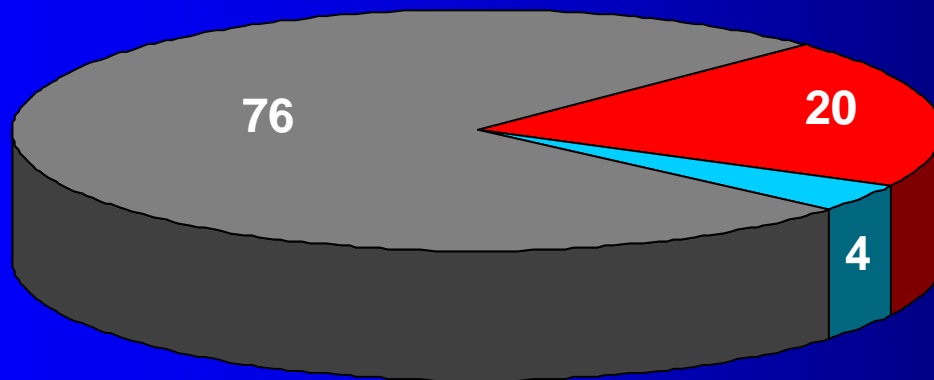


- High Potential
- Possible Local Significance
- Other Wetlands

Streamflow Maintenance

- Headwater wetlands - sources of streams and large wetlands in upper portion of watershed
 - terrene outflow wetlands
 - lotic headwater wetlands
- Wetlands in and along lakes
 - lentic wetlands

Casco Bay Watershed Wetlands: Streamflow Maintenance

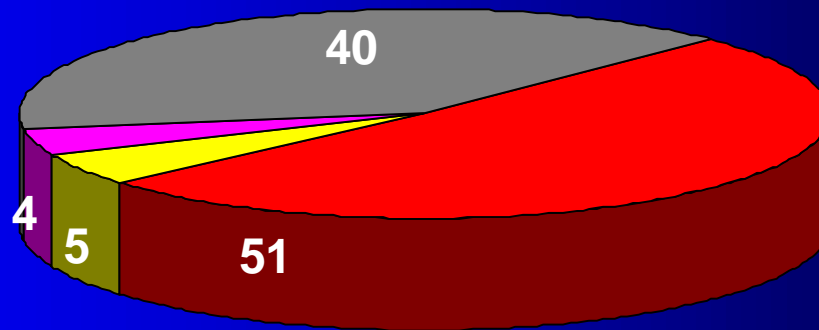


■ High Potential - Streams ■ High Potential - Lakes
■ Other Wetlands

Shoreline Stabilization

- Estuarine vegetated wetlands (coastal storm surge protection)
- Inland vegetated wetlands along rivers, streams, and lakes (help prevent shoreline erosion)

Casco Bay Watershed Wetlands: Shoreline Stabilization



■ High Potential - Lotic	■ High Potential - Lentic
■ High Potential - Estuarine	■ Other Wetlands

Provision of Fish and Wildlife Habitat

- Coastal and inland fishes
- Waterfowl and waterbirds
- Other wildlife
- Biodiversity

Coastal Fish Habitat

- Estuarine wetlands
 - Eelgrass beds, flats, marshes (spawning, nursery, and feeding grounds for coastal fishes)
- Tidal fresh marshes
- Vegetated rocky shores (some potential)

Freshwater Fish Habitat

- Lake fishes

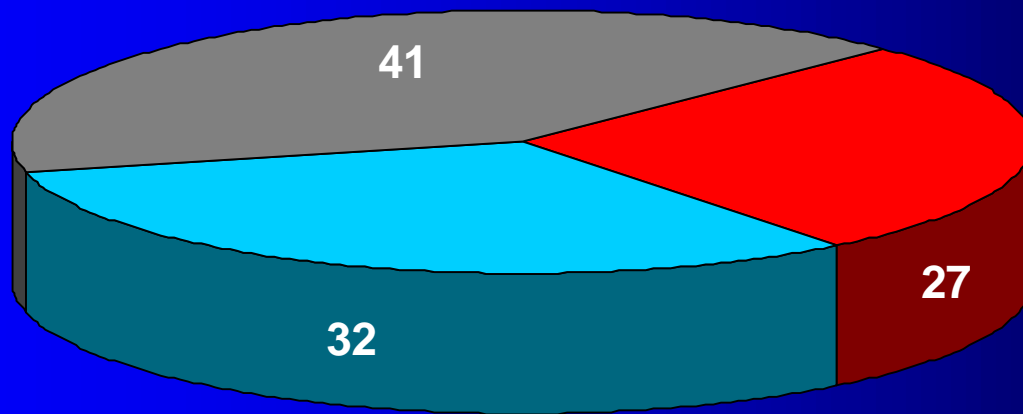
- Semipermanently flooded marshes
- Seasonally flooded forested wetlands (in some regions)

- River/Stream fishes

- Semipermanently flooded wetlands
- Seasonally flooded forested wetlands (in some regions)
- Forested and shrub wetlands along streams (some potential re: moderating stream temperatures)

Casco Bay Watershed

Wetlands: Fish Habitat



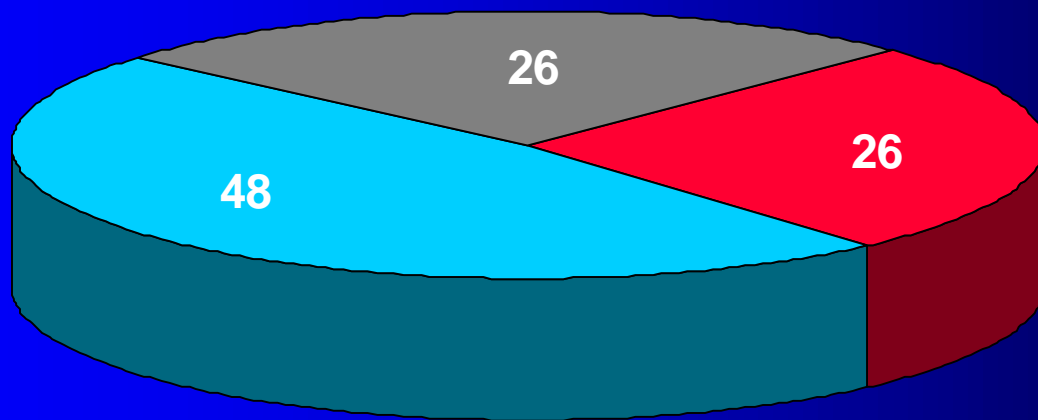
■ High Potential ■ Some Potential ■ Other Wetlands

Waterfowl and Waterbird Habitat

- Coastal wetlands
 - High potential - overwintering/summer
- Semipermanently flooded inland marshes
 - High potential
- Ponds
 - Some potential - mallards
- Wetlands along streams
 - Some potential - woodies, hooded mergansers, and green-winged teal

Casco Bay Watershed

Wetlands: Waterfowl & Waterbird Habitat

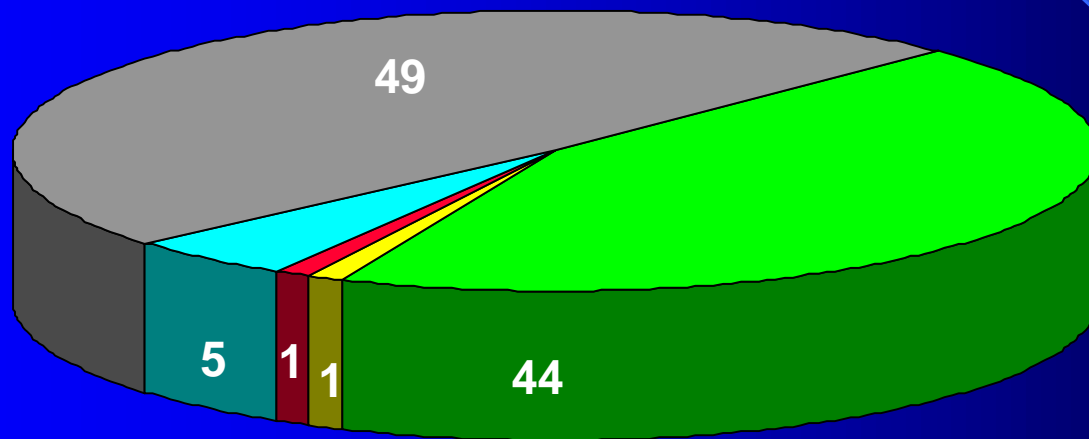







■ High Potential ■ Some Potential ■ Other Wetlands

Other Wildlife Habitat

- Large wetlands (≥ 20 acres)
- Smaller diverse wetlands (10-20 acres)
- Clusters of small wetlands (possible vernal pool areas)
- Urban wetlands

Casco Bay Watershed Wetlands: Other Wildlife Habitat

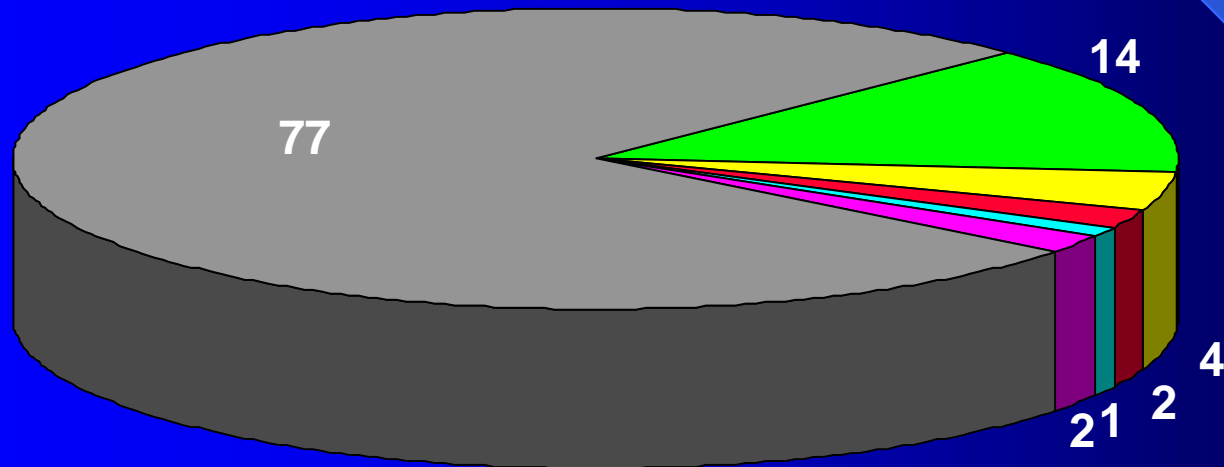


- | | |
|---|---|
|  Large Wetlands |  Small Diverse Wetlands |
|  Cluster Complexes |  Urban Wetlands |
|  Other Wetlands | |

Biodiversity

- Large wetland complexes (diverse covertypes)
- Rare/uncommon types in the watershed
 - freshwater tidal wetlands
 - estuarine marshes
 - shrub bogs
 - eelgrass beds
 - mussel reefs
 - larch swamps
 - lotic and lentic fringe wetlands

Casco Bay Watershed Wetlands: Biodiversity



- | | |
|----------------------------|-------------------|
| Large Diverse Complexes | Estuarine Marshes |
| Shrub Bogs | Eelgrass Beds |
| Other Significant Wetlands | Other Wetlands |

Step 3. Wetland Restoration Site Inventory

Wetland Restoration Site Identification

- Consult soil maps for hydric soil map units not identified as wetland = possible restoration sites (likely includes “difficult-to-identify” wetlands = not restoration sites)
- Examine up-to-date aerial photos to assess current condition of “candidate” sites
- Conduct field studies to validate interpretation
- Produce maps showing locations and restoration type
- Convert maps to digital data for GIS use

Massachusetts Example: Wetland Restoration Plan

- Update NWI maps
- Inventory potential wetland restoration sites
 - Type 1 = former wetlands (fill, drained, excavated)
 - Type 2 = existing, degraded wetlands
 - partly drained
 - impounded wetlands (including tidally restricted)
 - Phragmites wetlands (other invasives)
 - farmed/grazed wetlands
 - external effects (landfill, sedimentation, etc.)

Mass. Example (cont'd)

- Identify watershed deficits
 - Areas with flooding problems
 - Poor water quality areas
 - Areas where wildlife habitat needs attention (connectivity)
- Prepare draft restoration plan for public review and comment (send to ConComs/Agencies)
- Hold public meeting/solicit other sites
- Revise and publish final plan
- Help sponsor wetland restoration projects

Step 4. Wetland and Waterbody Buffer Analysis

Wetland/Waterbody Buffers - Condition & Restoration Sites

- Classify land cover/use within 100' to 600' buffer
 - Aerial photo interpretation or satellite image processing
- Identify vegetated buffers vs. developed buffers
- Identify potential sites for restoring vegetated buffers

Step 5. Assessing the Overall Ecological Condition of a Watershed

Assessing Overall Watershed Ecological Condition

- Many ways to approach topic
- One approach being developed by the FWS's
NWI = Ecological Integrity Index

Ecological Integrity Index

Considers a number of factors including:

- Amount of “natural habitat” remaining in a sub-watershed or other geographic area (natural acreage v. total acreage ratio)
- Estimated extent of presettlement wetlands remaining
- Condition of stream/waterbody buffers (woody vegetated v. developed or lawns)
- Condition of wetland buffers

Ecological Integrity Index (cont'd)

- Index = value between 1.0 and 0.0
 - Undeveloped subbasin = EII value of 1.0
 - Totally developed subbasin = EII at or near 0.0
- Higher the value, the more natural habitat left and likely better quality of water

Possible Uses of the Index

- Evaluate and monitor ecological condition of a watershed and land uses changes
- Compare differences among subbasins in a watershed and between watersheds (or other geographic areas)
- Correlate with water quality differences (including bioindicators) among subbasins
- Aid in projecting a “carrying capacity” for development (threshold) for a subbasin
- Serve as one statistic for reporting on the State of the Environment

Step 6. Define Goals and Objectives and Prepare Plan

Goals, Objectives, and the Plan

- Develop proposed goals/objectives
- Prepare a draft plan
- Get peer agency review of draft plan
- Revise goals/objectives based on review
- Publish final plan and distribute widely (post on internet)
- Prepare educational package for local schools

Wetland Conservation Plan: Summary

- Characterization of wetlands
- Preliminary assessment of wetland functions
- Inventory of potential wetland restoration sites
- Identification of watershed deficits
- Status of wetland/stream buffers and sites for restoration
- Assessment of the ecological integrity of the watershed
- Goals and objectives for wetland conservation

Uses of the Plan

- Guide for natural resource planning at all levels of government and for NGOs
 - Helps prioritize wetlands for acquisition, protection, and restoration
 - Forms basis of a wetland conservation strategy
- First cut analysis prior to engaging in detailed field studies (e.g., reference wetlands and site-specific evaluations)

Uses of the Plan (cont'd)

- Educates public on their wetland resources
 - Watershed perspective offers holistic view
 - Why and where wetlands are important
 - Better understand why wetlands need protection and restoration
- Serves as a monitoring report on the status of wetlands when prepared on a periodic basis
 - Is the Plan working?

Needs for 2000 and Beyond

- A vision to take us from here
- A plan
 - to guide wetland conservation
 - to connect wetlands with people (local values)
 - to educate the public on wetlands and key conservation issues
- A broader constituency for supporting wetland conservation initiatives

For the Latest Information on
the Concepts Presented,
Contact:

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