The "Logical Steps" of a Watershed-based Approach to Compensatory Mitigation

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&

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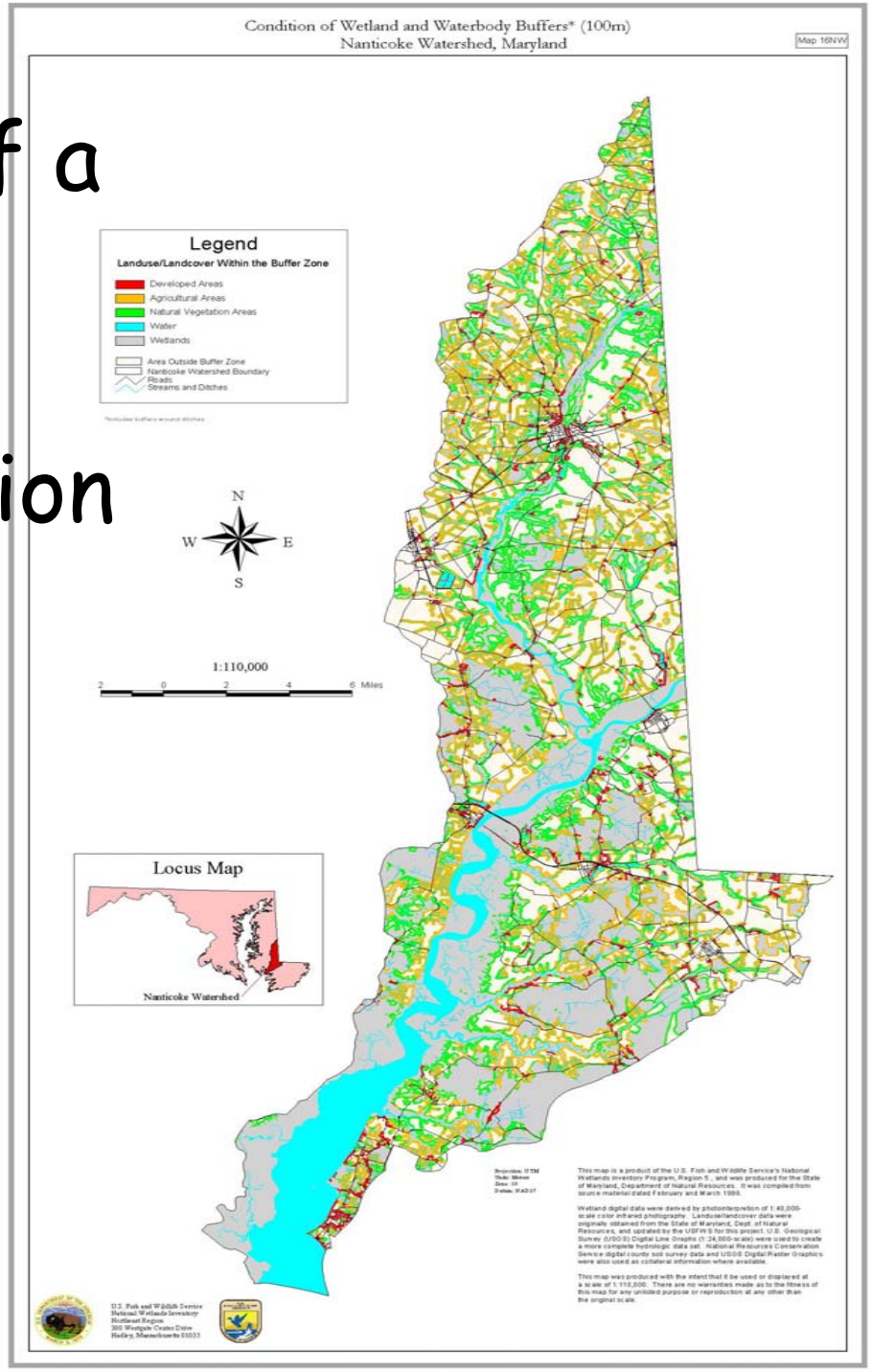


National Research Council Recommendations

Site selection for wetland conservation and mitigation should be conducted on a watershed scale in order to maintain wetland diversity, connectivity, and appropriate proportions of upland and wetland systems needed to enhance the long-term stability of the wetland and riparian systems.

National Mitigation Action Plan
December 2002

- **17 – point Action Plan to Address NRC Recommendations:**
  - *Integrating Compensatory Mitigation into a Watershed Context*
  - *Improving Compensatory Mitigation Accountability*
  - *Clarifying Performance Standards*
  - *Improving Data Collection and Availability*

National Mitigation Action Plan
December 2002

- **17 – point Action Plan to Address NRC Recommendations:**
  - *Integrating Compensatory Mitigation into a Watershed Context*

1. Identify best opportunities for mitigation/restoration
2. Determine how to establish linkages/connections between sites

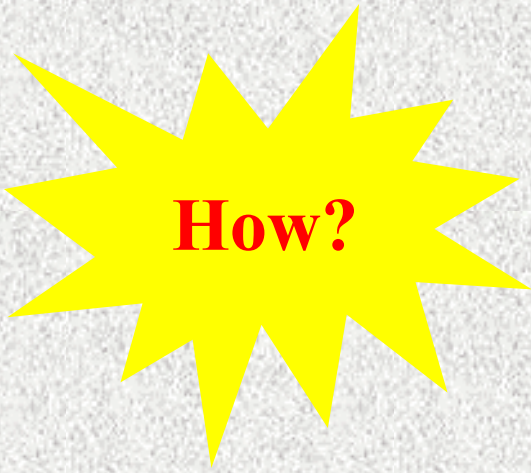
WHAT CAN WE REALISTICALLY ACCOMPLISH?

Today's Talk

- Proposed "Logical Steps" and other approaches to watershed-based decisions
- "Common elements" of watershed-based decision making
- Application of "common elements" in the absence of a formal watershed plan
- Examples of watershed-based decision-making process
- Potential barriers to implementation of watershed-based decision making
- Tools to support watershed-scale decision making

Our Long-term Goal

Site-based focus



Watershed-based focus

Approaches to Planning in a Watershed Context

ELI Literature Review

- Define critical issues
- Determine appropriate scale
- Understand watershed functions
- Conduct landscape assessment
- Site prioritization

"Five Logical Steps"

- Landscape assessment
- Historic assessment
- Assessment of remaining resources
- Analysis of priorities & restoration options
- Determination of specific info on aquatic resources to be restored.

- Watershed characterization
- Identification of issues
- Description of current conditions
- Description of reference condition
- Synthesis and Interpretation

Federal Guide for Ecosystem Analysis at the Watershed Scale (1995)

- Formulate management objectives
- Compile existing information
- Perform landscape analysis
- Produce recommendations

Center for Watershed Protection (2000)

Common Elements to Watershed Planning

Identification of issues, goals, objectives

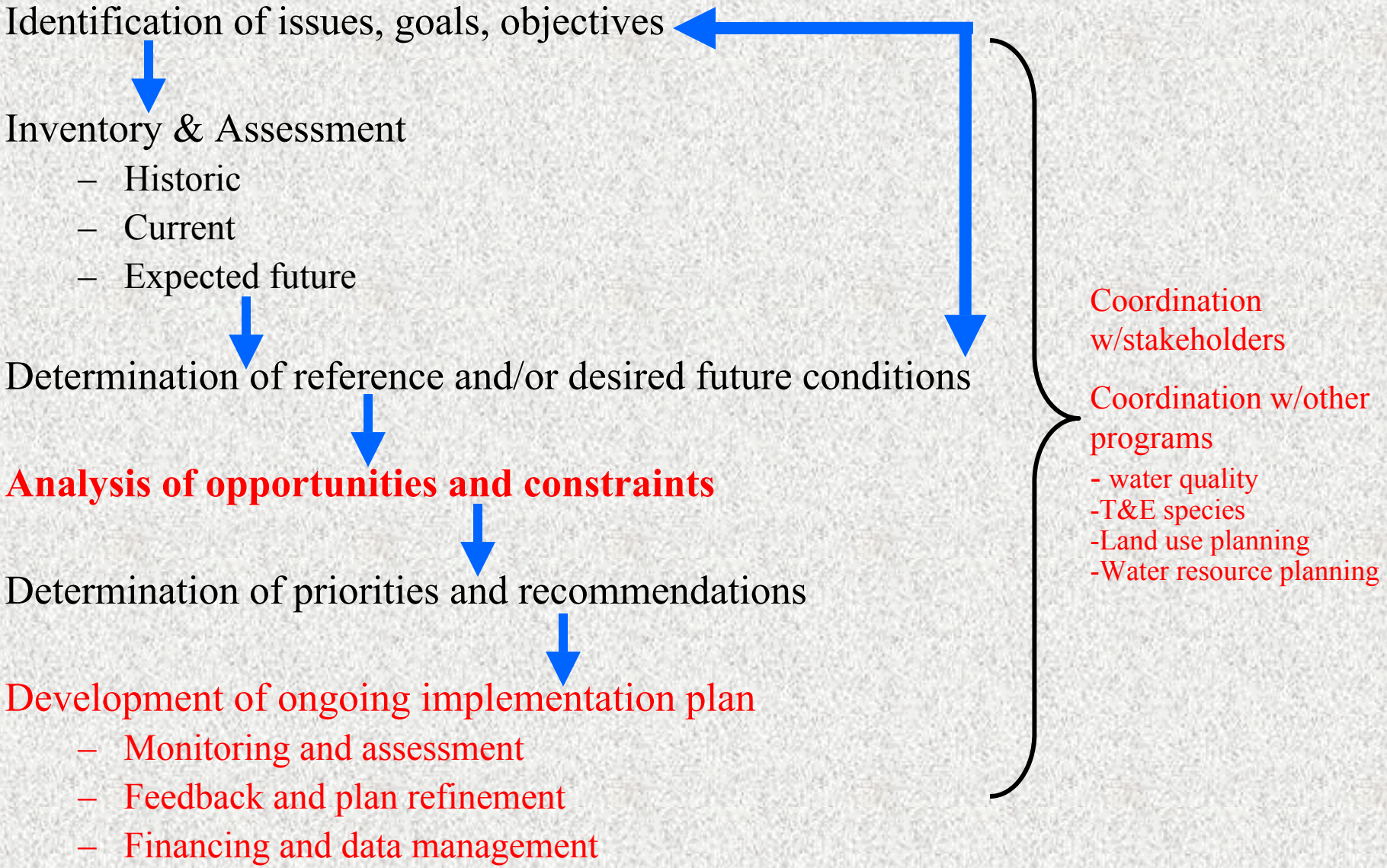
Inventory & Assessment

- Historic
- Current
- Expected future

Determination of reference and/or desired future conditions

Determination of priorities and recommendations

Modified Common Watershed Planning Elements



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Common Watershed Planning Elements

Identification of issues, goals, objectives

Inventory & Assessment
- Historic
- Current
- Expected future

Determination of reference and/or desired future conditions

+

Analysis of opportunities and constraints

=

Determination of priorities and recommendations

Development of ongoing implementation plan
- Monitoring and assessment
- Feedback and plan refinement
- Financing and data management

Coordination w/stakeholders

Coordination w/other programs
- water quality
-T&E species
-Land use planning
-Water resource planning

Project-specific Analogues to "Common Elements"

Identification of issues, goals, objectives	Identification of regional conservation goals and objectives
Inventory & Assessment	Identification of regionally rare wetlands
	Consideration of connectedness etc.
Determination of reference and/or desired future conditions	Consider regional reference "templates"
Analysis of opportunities and constraints	Consideration of site constraints – Likelihood for success – Appropriate landscape context
Determination of priorities and recommendations	Determination of priorities
Development of ongoing implementation plan	Inclusion of mechanism for ongoing monitoring and management
Coordination with stakeholders	Ongoing dialogue with stakeholders
Coordination with other programs	Prioritize wetlands based on goals of other plans (T&E spp, water quality)

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Examples of Watershed-based Decision-making

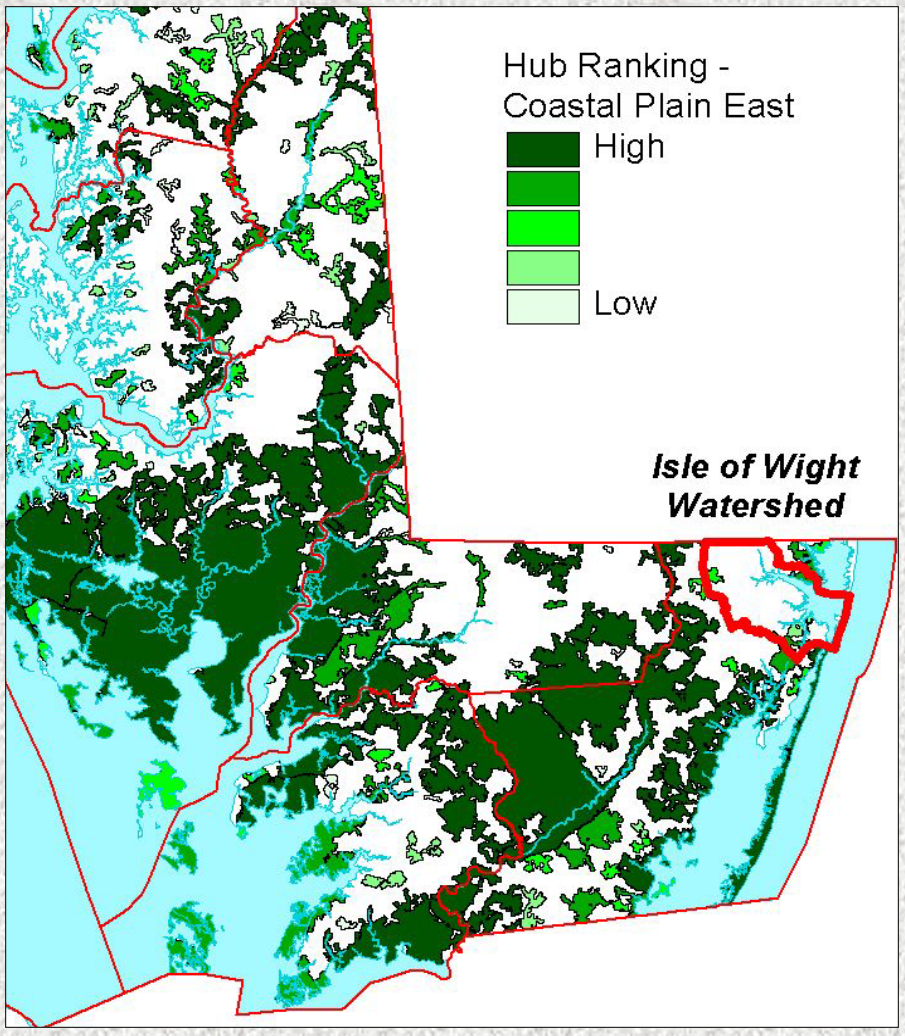
- Regional-scale
- Sub-basin / local catchment scale
- Project – specific scale

Hierarchical Strategy for Prioritizing Wetland & Riparian Conservation and Restoration

Maryland Department of Natural Resources

Regional Landscape Assessment

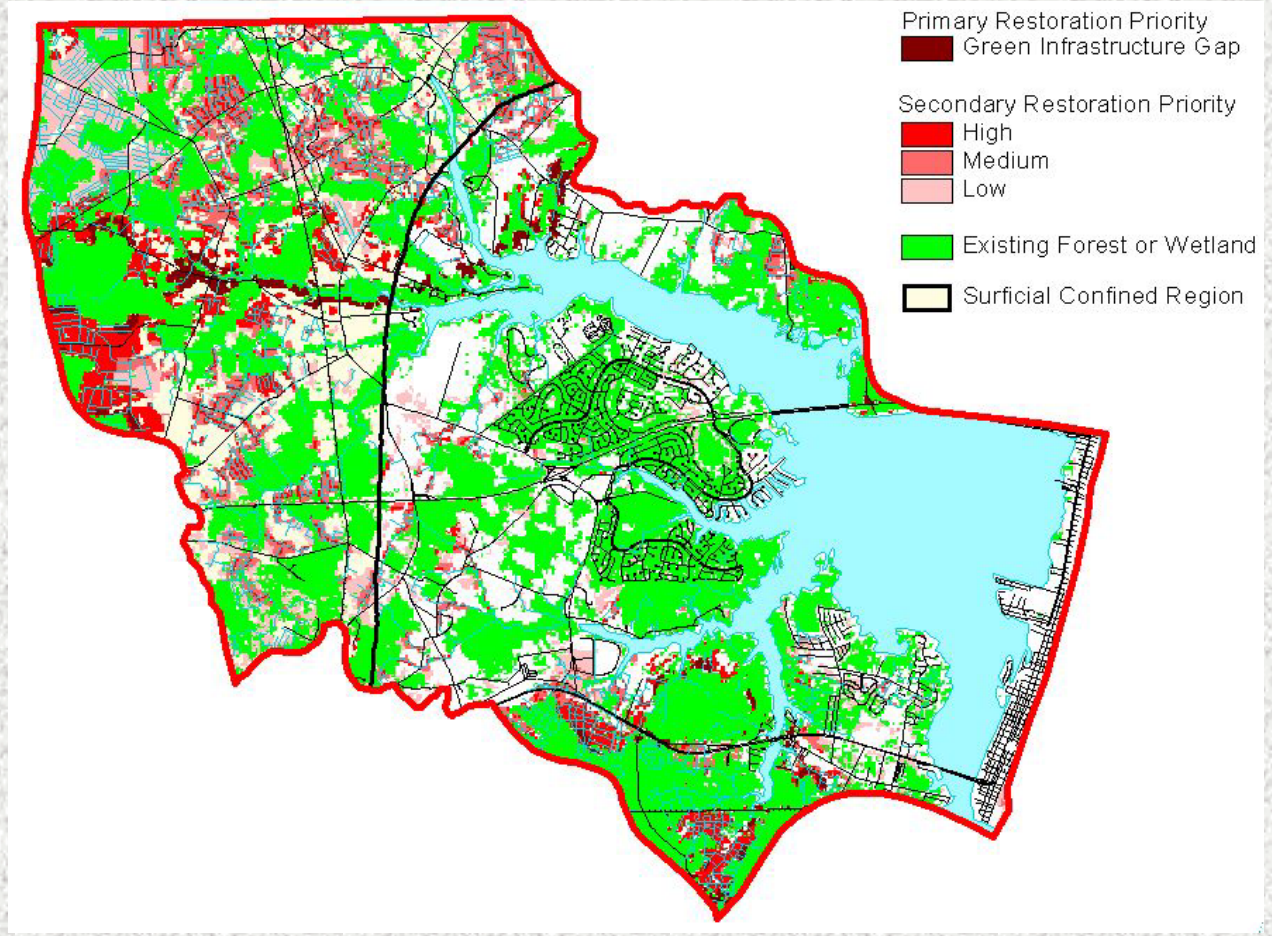
Rationale – GI Hub and Corridor rankings provide regional context for conservation and restoration activities



Statewide | **Regional** | Watershed | Local

Hierarchical Strategy for Prioritizing Wetland & Riparian Conservation and Restoration

Prioritizing Restoration Opportunities at the Watershed Scale

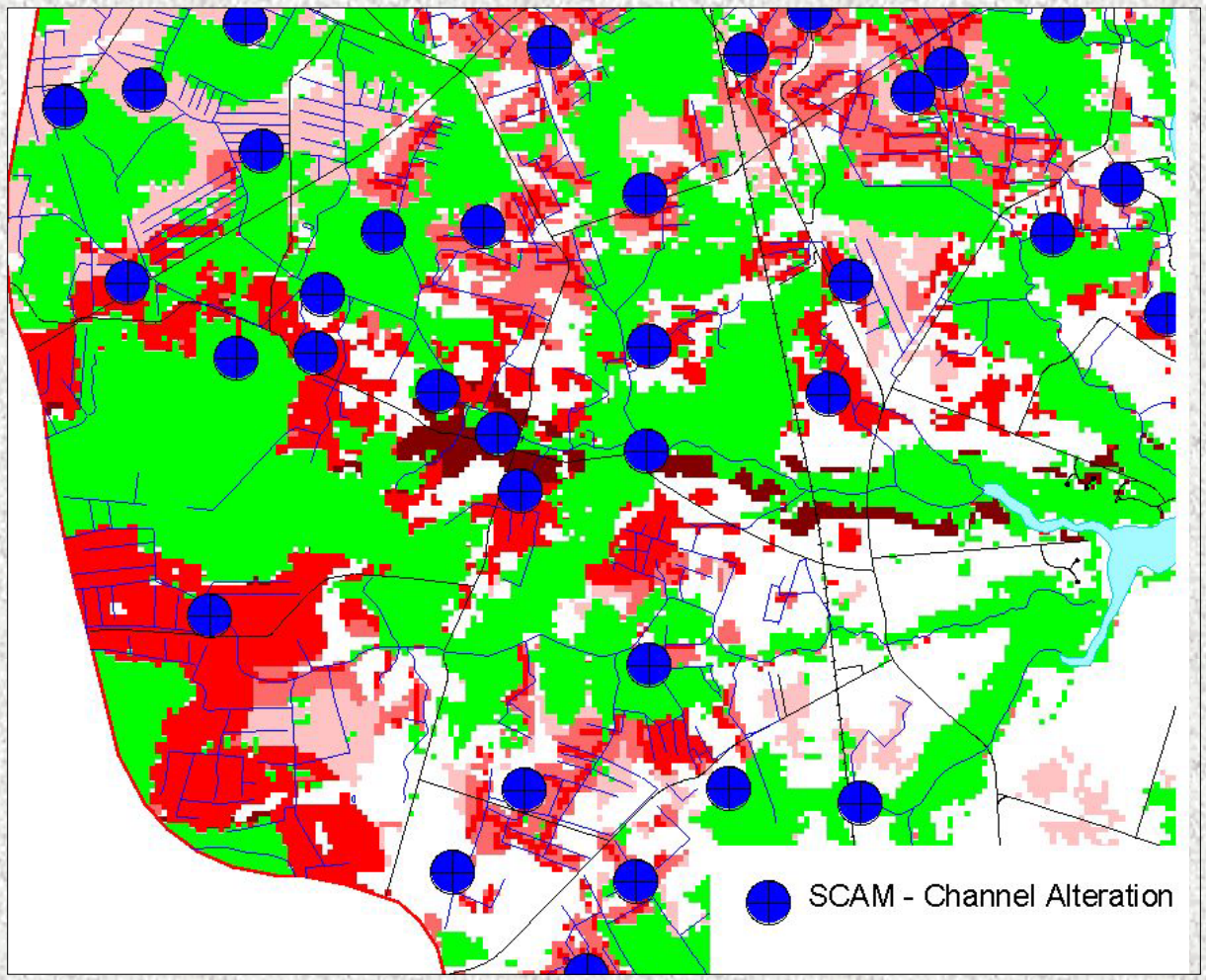


Statewide | Regional | **Watershed** | Local

Hierarchical Strategy for Prioritizing Wetland & Riparian Conservation and Restoration

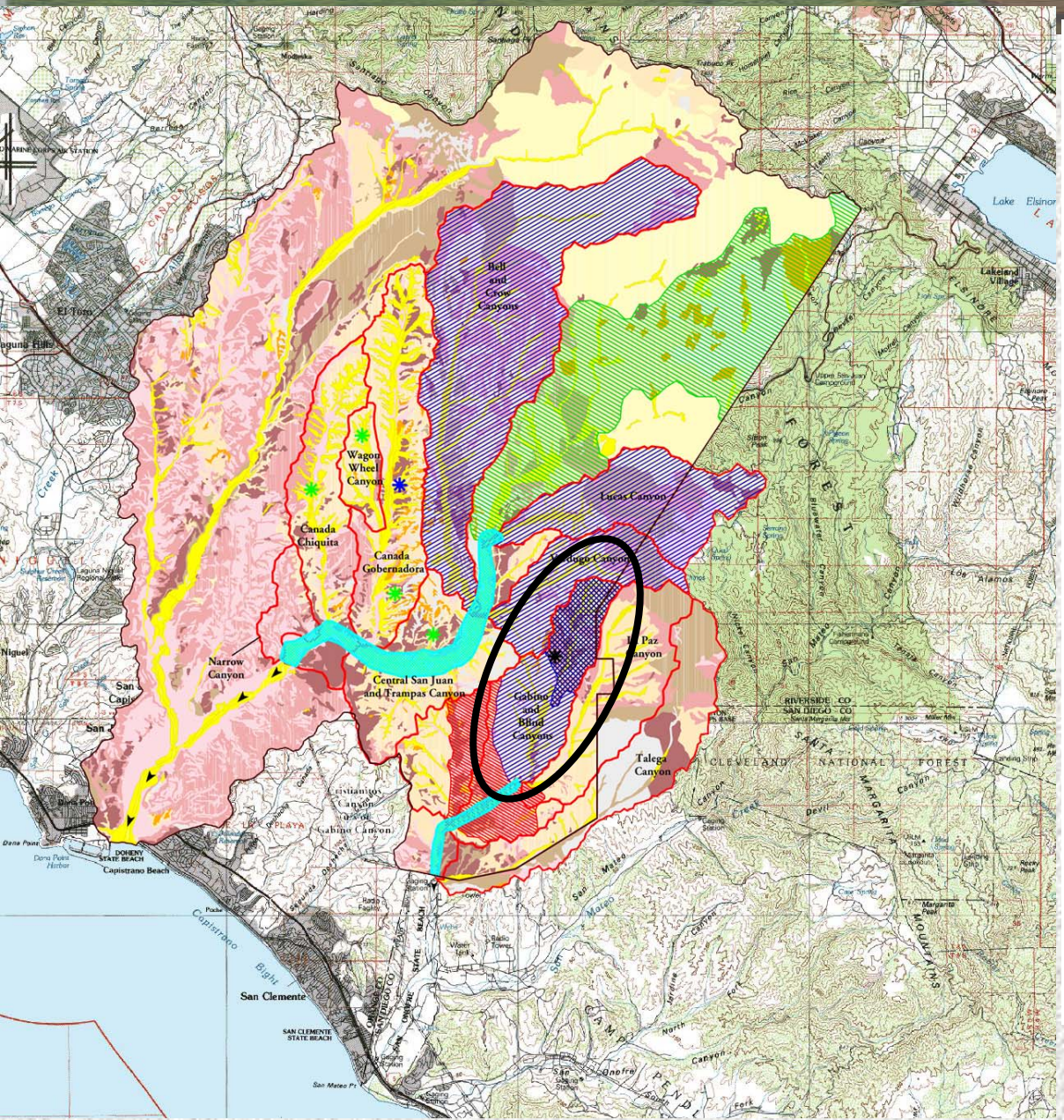
Site-specific Restoration Priorities (Stream Corridor Assessment)

Rationale – Water quality and habitat benefits associated with reestablishing natural channel conditions



Statewide | Regional | Watershed | **Local**

San Juan Watershed Planning (SAMP)



Sediment Sources and Transport

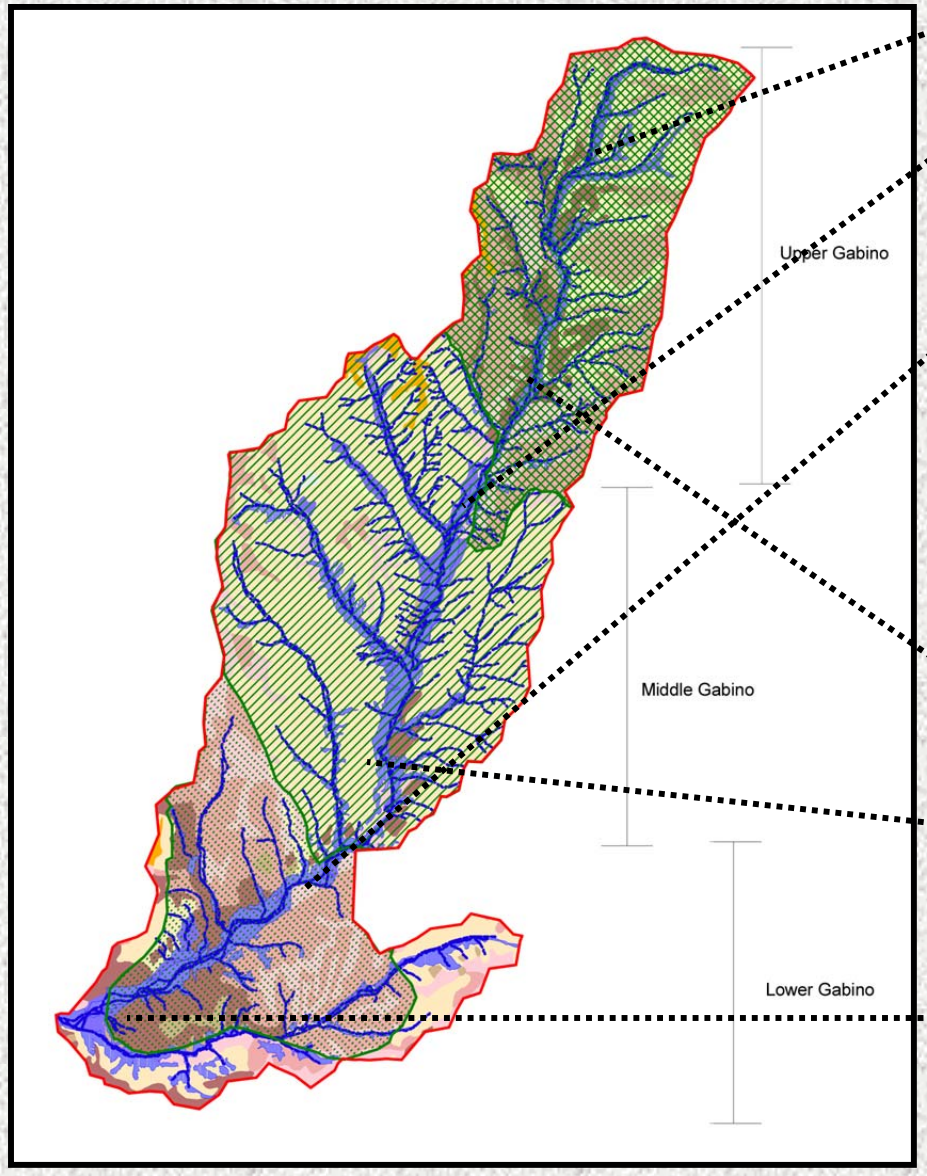
- Important sediment transport function
- Sand and gravel sediment yield
- Inferred yields of coarse sediment
- Fine sediment yield
- Mix of sand/gravel and fine sediment yield
- Gobernadora currently produces high sediment yield, but this may be a transient situation
- Erosion in middle and upper Gabino Canyon may be contributing to high sediment yield from this sub-basin
- Sandy terrains produce sediment during extraordinary episodic events
- Sediment transport to downstream areas

Erodability Classification

- Rocky or unclassified
- Erodable Sand
- Alluvial
- Less Erodable Upland Sand
- Erodable Clay
- Less Erodable Clay, Mid to Low Slope
- Less Erodable Clay, High Slope
- Erodable Silt, Low Slope
- Erodable Silt, High Slope

- Sub-basin Boundaries

Mitigation Planning for Gabino Canyon



Preserve Sediment Deposition

Opp. for floodplain restoration

Planning Considerations for Gabino Canyon

- Limit impervious surfaces in upper sub-basin
- Restore headwater areas to reduce production of fine sediment
- Preserve confined, sediment transport reaches in the mid sub-basin
- If development occurs, concentrate on clay-soils in the lower sub-basin where proportional increases in runoff will be minimized
- Protect water quality of Gabino Creek by focusing water quality treatment systems along degraded side-canyons where past clay mining occurred
- Opportunities for enhancement of floodplain and buffer areas in broad meandering lower sub-basin

Conceptual Project-specific Checklist

Watershed-based Decision Criteria

Does site contain a regionally rare wetland or sensitive species?	Y/N
Do other wetlands exist with 1 km (non-riverine)? Is site contiguous up and downstream (riverine)?	Y/N Y/N
Are there major cost or logistic constraints to site restoration?	Y/N
Is the adjacent land use primarily open or undeveloped?	Y/N
Is upstream/catchment hydrology relatively intact?	Y/N
Is site associated with other management programs?	Y/N
Is there a mechanism for ongoing monitoring/management	Y/N
Are adjacent land uses expected to change in the near future?	Y/N

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Potential Barriers to Implementation

- Availability of regional/synoptic information at multiple scales
- Mechanism to easily compile and access data
- Differences in institutional/agency missions or objectives
- Efficient mechanisms for including local land use authorities
- Mechanisms to integrate or balance with other watershed-scale management programs
  - Multi-species conservation plans
  - Watershed-based water quality programs
  - Flood and fire control programs
  - Vector control
- Others???

How can we address these barriers?

Management Recommendations to Overcome Barriers

- Clearly articulated objectives
- Scales of analysis and planning
  - Appropriate management unit
- Phasing/tiers of assessment and management
- Iterative approach
- Implications of data gaps → prioritization of new data acquisition
- Integration into existing programs
- Long-term data management and access

What recommendations should be made?

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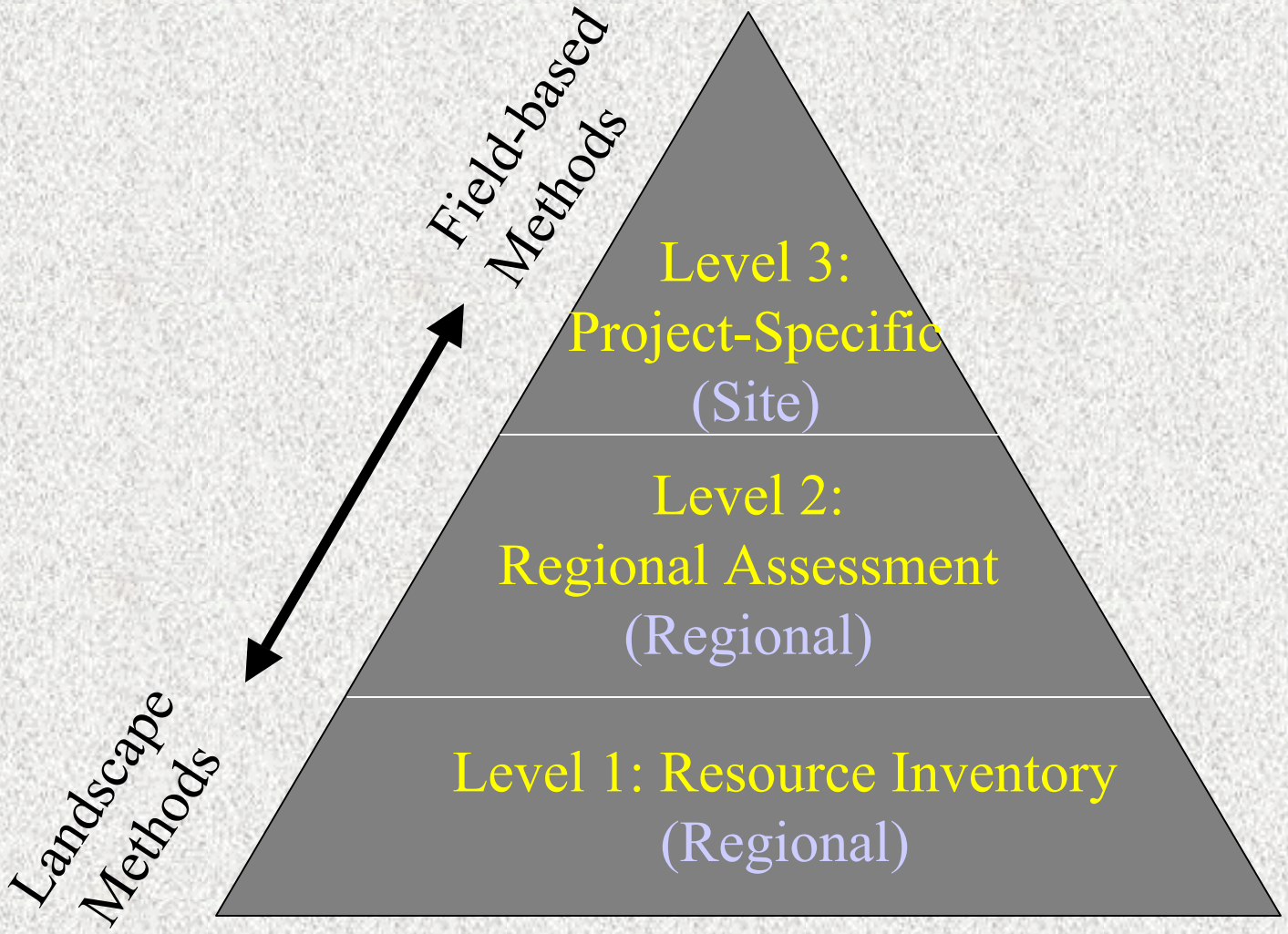
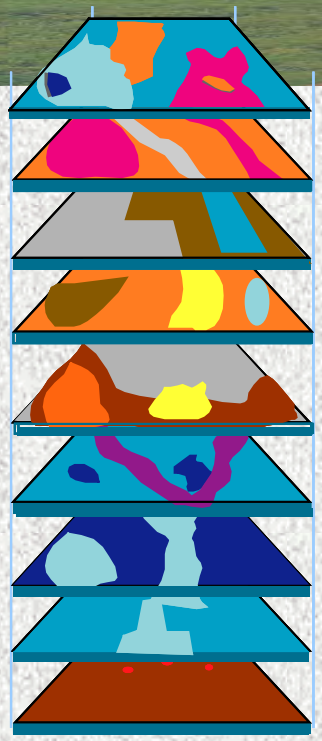
Three Tiers of Regional Wetland Monitoring and Assessment Programs



S. Ca. Riparian Ecosystem Assessment Method (SCREAM)

Land Cover (30 meter TM)



Vegetative Cover

Land Use

Hydro-modifications

Impervious Cover

Soil

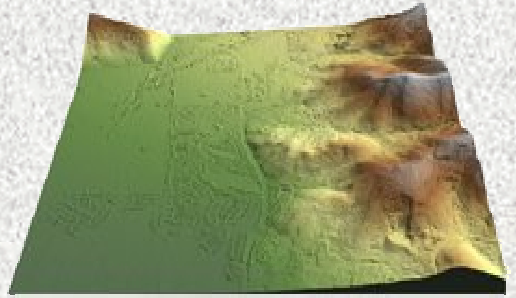
Exotic Species

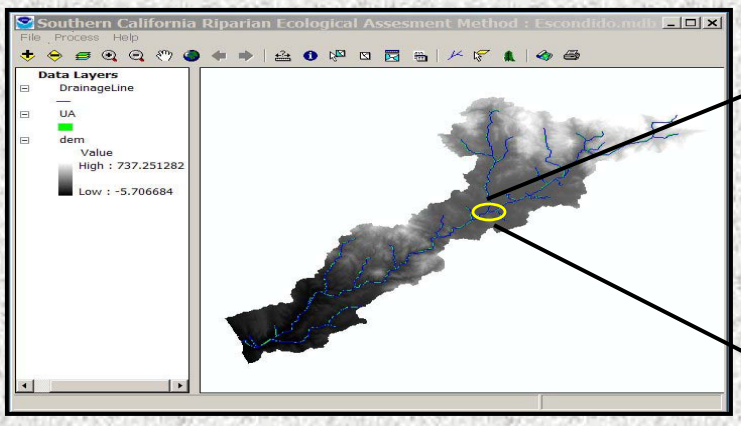
Topography

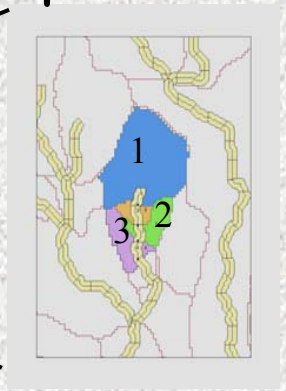
Entrenchment

Floodplain Condition

Topography (IfSAR)
5 meter DEM, P-band

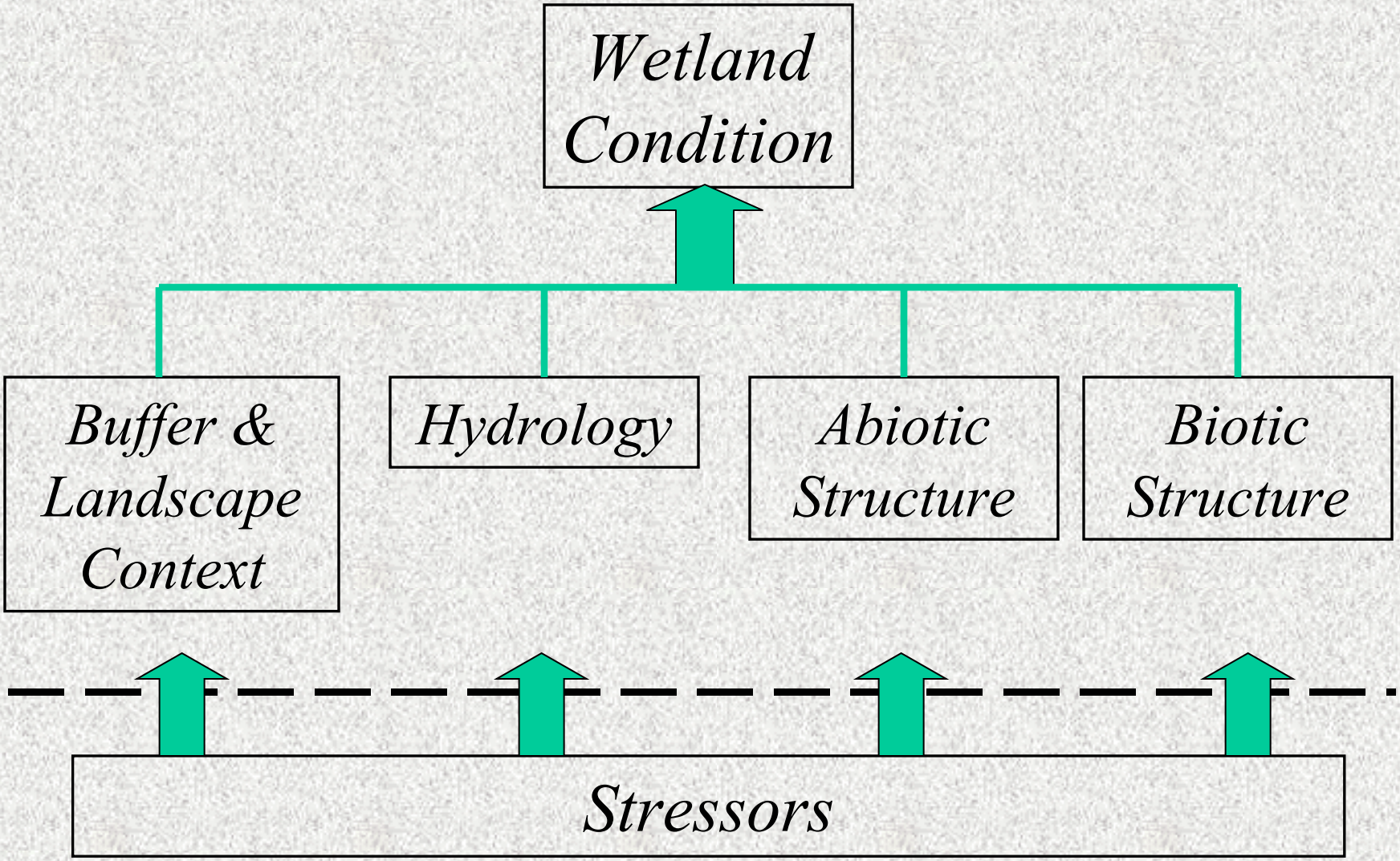




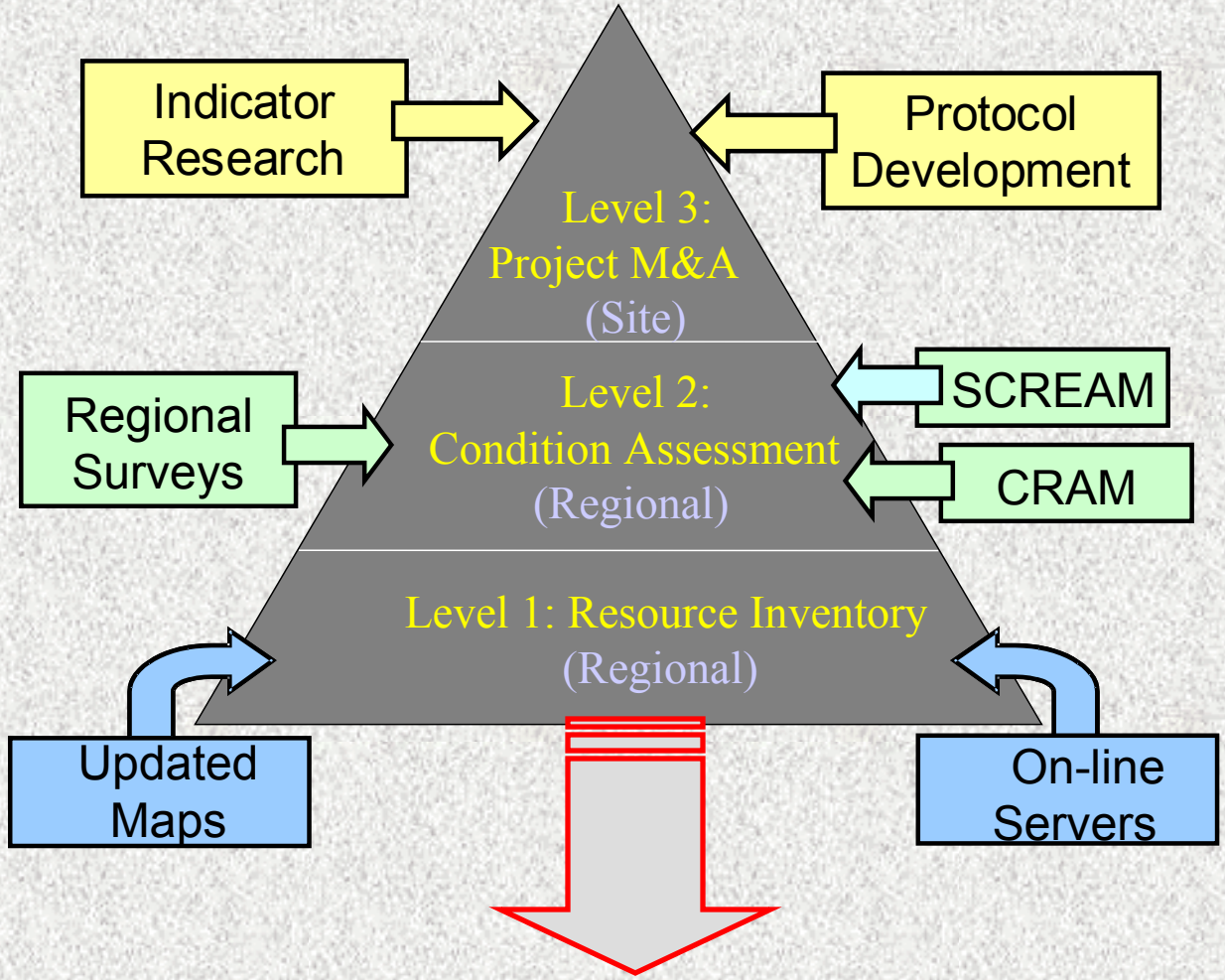


Overall Condition

Ca Rapid Assessment Method (CRAM) Conceptual Framework:



Integrated Assessment Toolkit

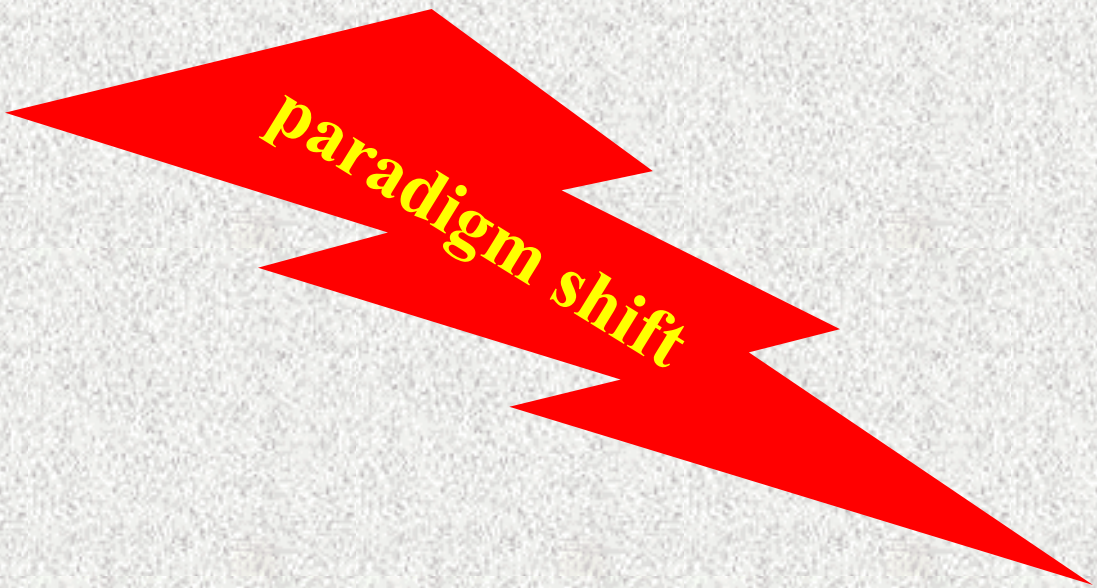


Integrated Watershed-based Monitoring and Assessment

Encouraging the Paradigm Shift

- Develop tools to facilitate watershed perspective for project-specific decisions
  - Specific and consistent guidance
- Address barriers to implementation
  - Information
  - Tools and methods
  - Institutional/cultural
- Efficient mechanisms for information exchange and inter-agency/jurisdiction communication
- Tools for ongoing monitoring and assessment at the local, regional, and national scale

Site-based focus



Watershed-based focus

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