Water Environment Association
Preserving & Enhancing Ohio's Water Environment

Report from the Nutrients Technical Advisory Group (TAG)

Nutrients Rulemaking Status Update

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Agenda

- TAG Role/Rulemaking timeline
- Nutrient rules basis
- Stream Nutrient Assessment Procedure (SNAP)
- Implementation Issues
  - When PS nutrient controls should apply
  - Water Quality Targets
  - Adaptive Management
  - Permit Limits & Conditions
  - Compliance Schedules

Ohio EPA Nutrients Rulemaking

- OEPA Early Stakeholder Outreach …….. 3/2013
  - Notice of intent to develop rules for nutrient water quality standards
- Technical Advisory Group (TAG)
  - First meeting …… 11/2013
  - Expected final recommendations …….. mid-2015
- OEPA preliminary draft rules …….. late 2015?

Nutrients Technical Advisory Group (TAG)

- Nov 2013 – to date: 13 meetings
- OEPA staff consultation
- Developed new tool to assess nutrients enrichment condition
- Currently evaluating detail aspects of implementation issues for nutrients WQ rule
- TAG will submit recommendations to Ohio EPA

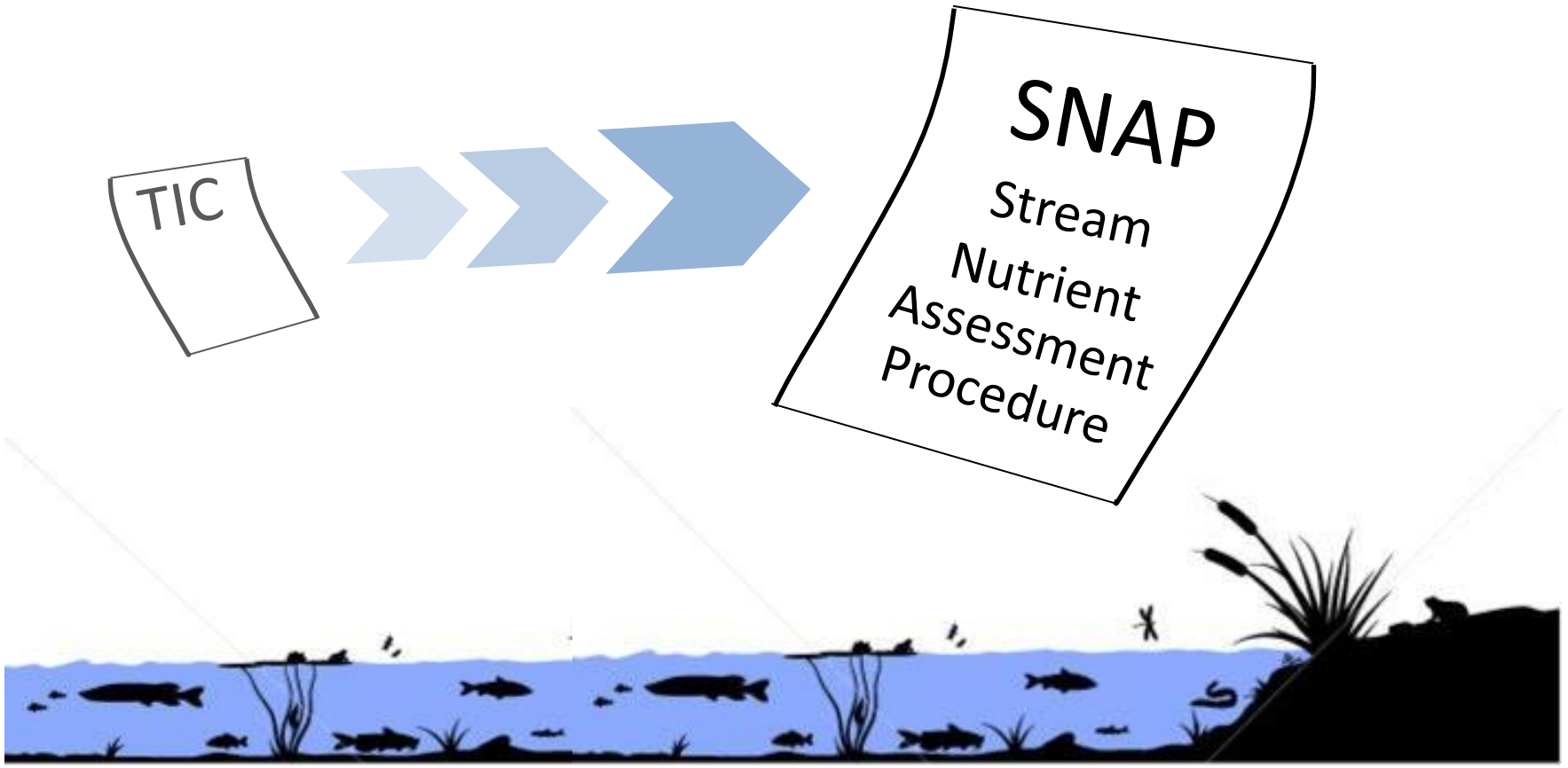
Disclaimer

- *TAG is developing specific recommendations to Ohio EPA for their use in writing new rules*
- *This presentation summarizes the current status of key issues in this package of recommendations*
- *Final TAG recommendations may be different*

Regulations to Manage Nutrient-Caused Water Quality Impairment

- Nutrients aren't like other pollutants
  - ***Rules for other pollutants WON'T fit !***
- Numerous variables – stressors – combine to result in "nutrient-caused impairment"
  - High nutrient levels alone don't necessarily cause nutrient enrichment and biological impairment
  - Non-nutrient stressors may need to be addressed
- Procedure needed to determine if nutrients cause a problem to be managed
- Implementation procedures needed to determine how to manage nutrient-caused WQ impairment

What's changed in the last year?



Need for better assessment tool

- Proposed TIC (Trophic Index Criterion):
  - Too rigid: inflexible
  - False positives & false negatives
  - Nutrient concentration metric is problematic
  - No consideration of habitat impacts
  - Name misunderstanding: not a “criterion”

- TAG, with Ohio EPA input, developed a ***Stream Nutrient Assessment Procedure*** = **SNAP**

Basis of SNAP: 'weight of evidence' approach

FIRST: Determine biological WQ criteria attainment

- *Biocriteria are the direct measure of WQ !*

NEXT: Evaluate key nutrient response indicators*

- DO swings: 24-hour (max DO - min DO)
- Benthic chlorophyll

THEN: Confirm preliminary condition assessment

- Other stressors – physical habitat or pollutants?
- If not impaired, determine if threatened

** Nutrient concentration is poorly correlated with nutrient enrichment-caused impairment*

Proposed **Stream Nutrient Assessment Procedure (SNAP)**

Step 1	Step 2	Step 3	Step 4	
Biological Criteria	**DO Swing**	**Benthic Chlorophyll**	**Trophic Condition Status**	
All indices attaining or non-significant departure	Normal or low swings (≤6.5 mg/l)	Low to moderate (≤320 mg/m^2)	Attaining use / not threatened	
		High (>320 mg/m^2)	Attaining use, but may be threatened	*See Flow Chart A*
	Wide swings (>6.5 mg/l)	Low (≤182 mg/m^2)		
		Moderate to high (>182 mg/m^2)		
Non-attaining (one or more indices below non-significant departure)	Normal or low swings (≤6.5 mg/l)	Low to moderate (≤320 mg/m^2)	Impaired, but cause(s) other than nutrients	*See Flow Chart B*
		High (>320 mg/m^2)	Impaired / likely nutrient enriched	*See Flow Chart C*
	Wide swings (>6.5 mg/l)	Low (≤182 mg/m^2)		
		Moderate to high (>182 mg/m^2)	Impaired / Nutrient enriched	

EXAMPLE

Proposed Stream Nutrient Assessment Procedure (SNAP)

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		Moderate to high (>182 mg/m^2)	Impaired / Nutrient enriched	

SNAP: FLOW CHART A.

Determines if biologically-attaining condition is threatened

- Used when:
  - biological criteria are attaining

  BUT

  - Nutrient response indicator(s) are elevated
    (DO swing and/or benthic chlorophyll)
- Possible assessment outcomes:
  - Not threatened
  - Threatened by other (non-nutrient) causes
  - Threatened by nutrients

SNAP: FLOW CHART B.

Determines when biological impairment may be caused by stressors other than nutrients

- Used when:
  - one or more biological criteria are non-attaining

  BUT

  - No nutrient response indicators are elevated *(DO swing or benthic chlorophyll)*
- Possible assessment outcomes:
  - Stressors other than nutrients cause impairment
  - Natural conditions / habitat cause impairment
  - Ambiguous . . . collect more information

SNAP: FLOW CHART C.

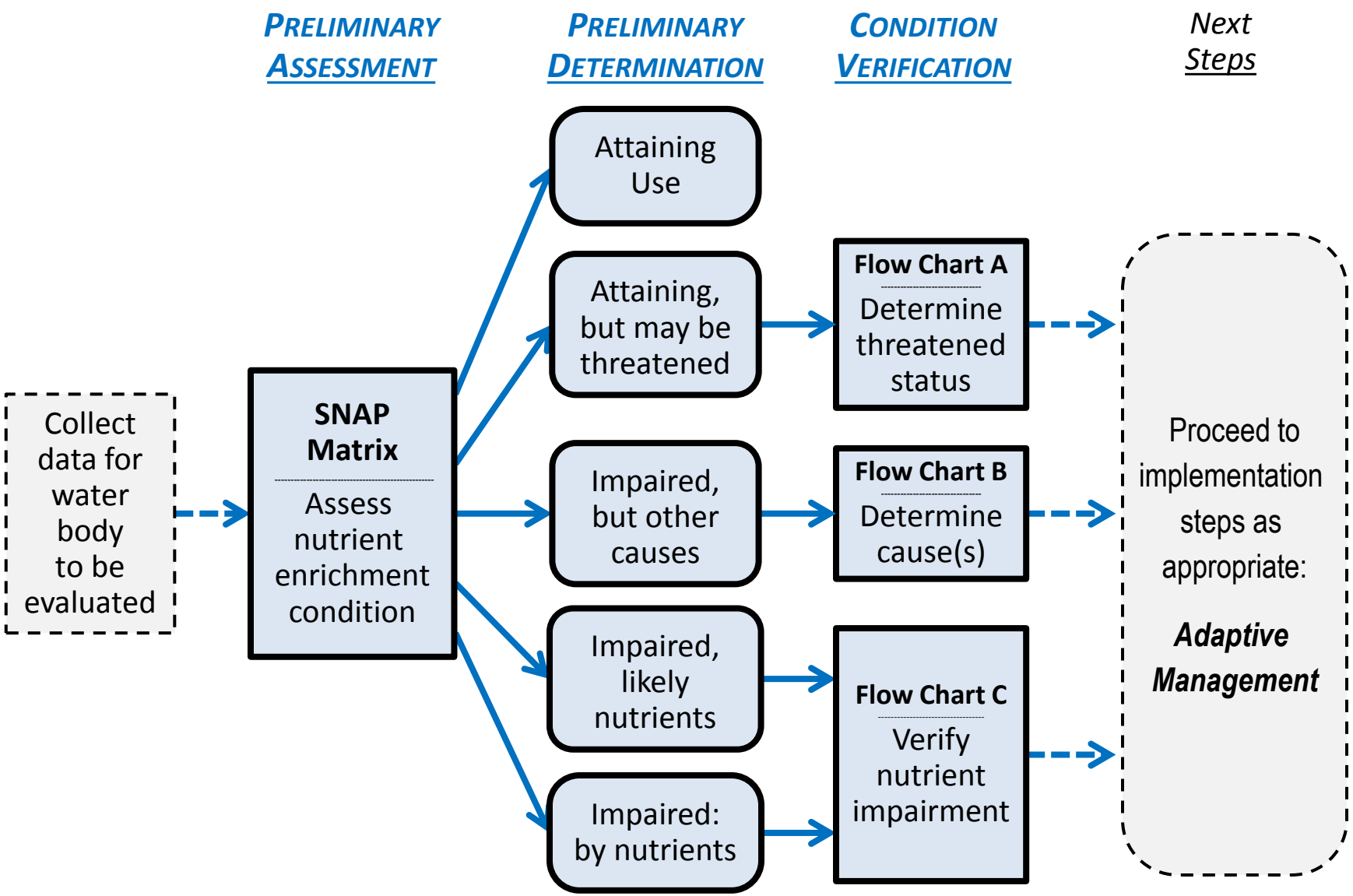
Confirms when biological impairment is caused by nutrients

- Used when:
  - One or more biological criteria are non-attaining

  AND

  - Either nutrient response indicator is elevated
    (DO swing or benthic chlorophyll)
- Possible assessment outcomes:
  - Abatement of nutrients will restore biological condition
  - Abatement of nutrients will not restore biology;
    Perform Use Attainability Analysis, or collect additional data
  - Stressors other than nutrients cause impairment

Stream Nutrient Assessment Procedure (SNAP)



Where does the SNAP apply?

- Free-flowing stream segments with verified designated aquatic life uses and less than 1,000 sq.mi. drainage area
- Free-flowing stream segments, presently undesignated and less than 1,000 sq.mi., where biological survey demonstrates that tiered aquatic life use is applicable

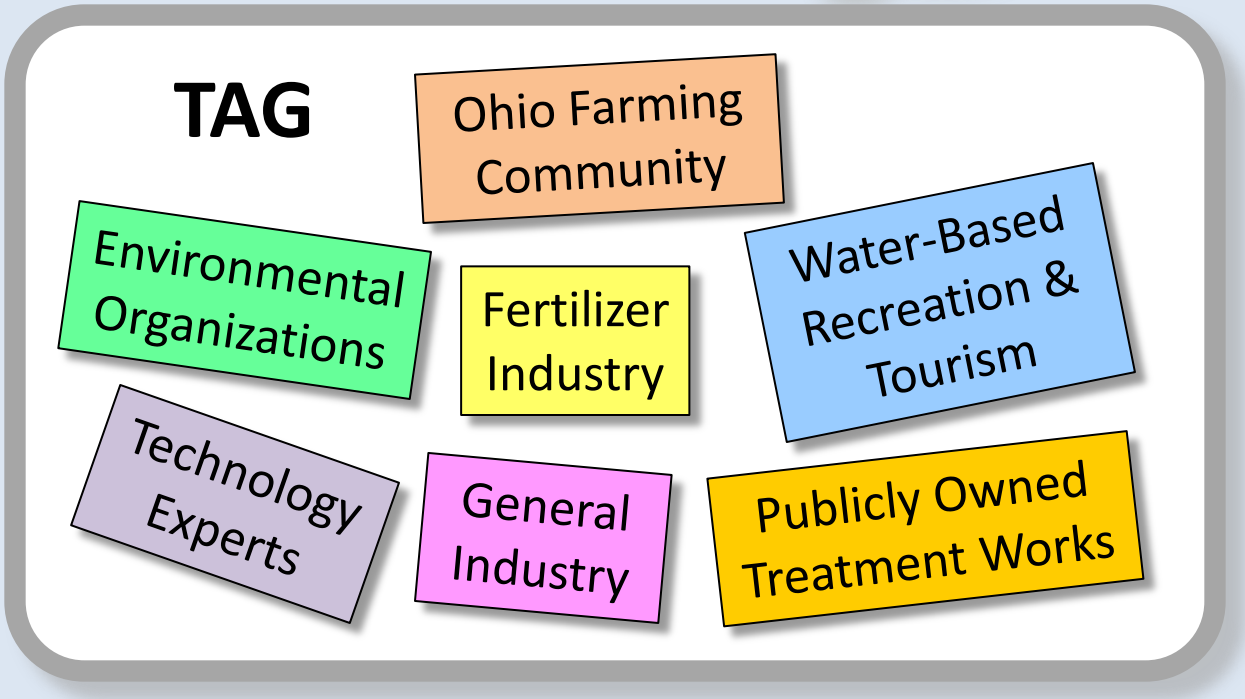
- SNAP does **not** apply:
  - Large rivers: >1,000 sq.mi. drainage area
  - Case-by-case: drainage area >500 sq.mi. that behave more like large river segments
  - Headwater and small streams

Legal Status of the SNAP

- SNAP will be performed as part of Ohio's water quality assessment program
- Used to determine impairment/threat for the Integrated Report 303(d) listing
- Once approved in rule, SNAP itself will not be subject to legal challenge
- EPA Actions based on SNAP can be challenged
  - 303d listing
  - TMDLs
  - WQBELs

WORK IN PROGRESS!

Implementation Issues



Impaired vs. Threatened

- SNAP determines if attaining, impaired or threatened
- Propose new 303(d) listing category for "Threatened" by nutrients
  - Threatened waters in attainment now, but trends suggest will not be in future
  - "Watch" threatened waters – no TMDL
  - Cap existing PS nutrient loads, but do not impose new more stringent controls

When Should a PS Remove Nutrients?

- If SNAP determines nutrient-caused impairment
- What is relative PS contribution?
- If there will be an environmental benefit?
- ***Will PS nutrient reduction materially improve biology?***

POINT SOURCE CONTRIBUTION

0% → Effluent Dominated

- **TMDL calculated (LAs only)**

- **TMDL calculated (WLAs + LAs)**
- **Feasibility Study of PS Removal Options**
- **Evaluation of Other Management Alternatives**

- **TMDL calculated (WLAs + LAs)**
- **Feasibility Study of PS Removal Options**

PS reductions will not materially improve biology ←

→ *PS reductions will materially improve biology*

Steps to Perform

- Cap existing PS nutrient loadings
- Optimize and/or maintain existing PS facilities
- Perform feasibility study
  - Evaluate treatment alternatives
  - Affordability assessment
  - Compliance timetable
- Assess expected water quality improvement:
  - Will PS reductions make material improvement?
  - If yes, proceed

If Abatement Won't Restore Use

- If abatement of nutrient stressors won't restore the biological condition:
  - Perform Use Attainability Analysis (UAA)
    - But difficult to get use designation changed!
  - Apply for WQ Variance
    - Less stringent limit
  - Other options?

Then What?

- Once it is determined that a PS must reduce nutrients:
  - Cap at existing levels
  - TMDLs
    . . . WLAs and LAs
  - Adaptive Management
  - Compliance Schedules

Water Quality Targets

- WQ Target values necessary
- Load versus Concentration
- Necessary for development of:
  TMDLs, **WLA**s, **LA**s, and **WQBEL**s
- Site specific nutrient targets developed based on modeling with appropriate response indicator values
  - Dissolved Oxygen Swing
  - Benthic Chlorophyll *a*

Water Quality Target:
Surrogate Values

- In the absence of modeling, surrogate targets can be used:
  - Total Phosphorus (TP)
  - Dissolved Inorganic Nitrogen (DIN)

    (when appropriate)

Adaptive Management (AM)

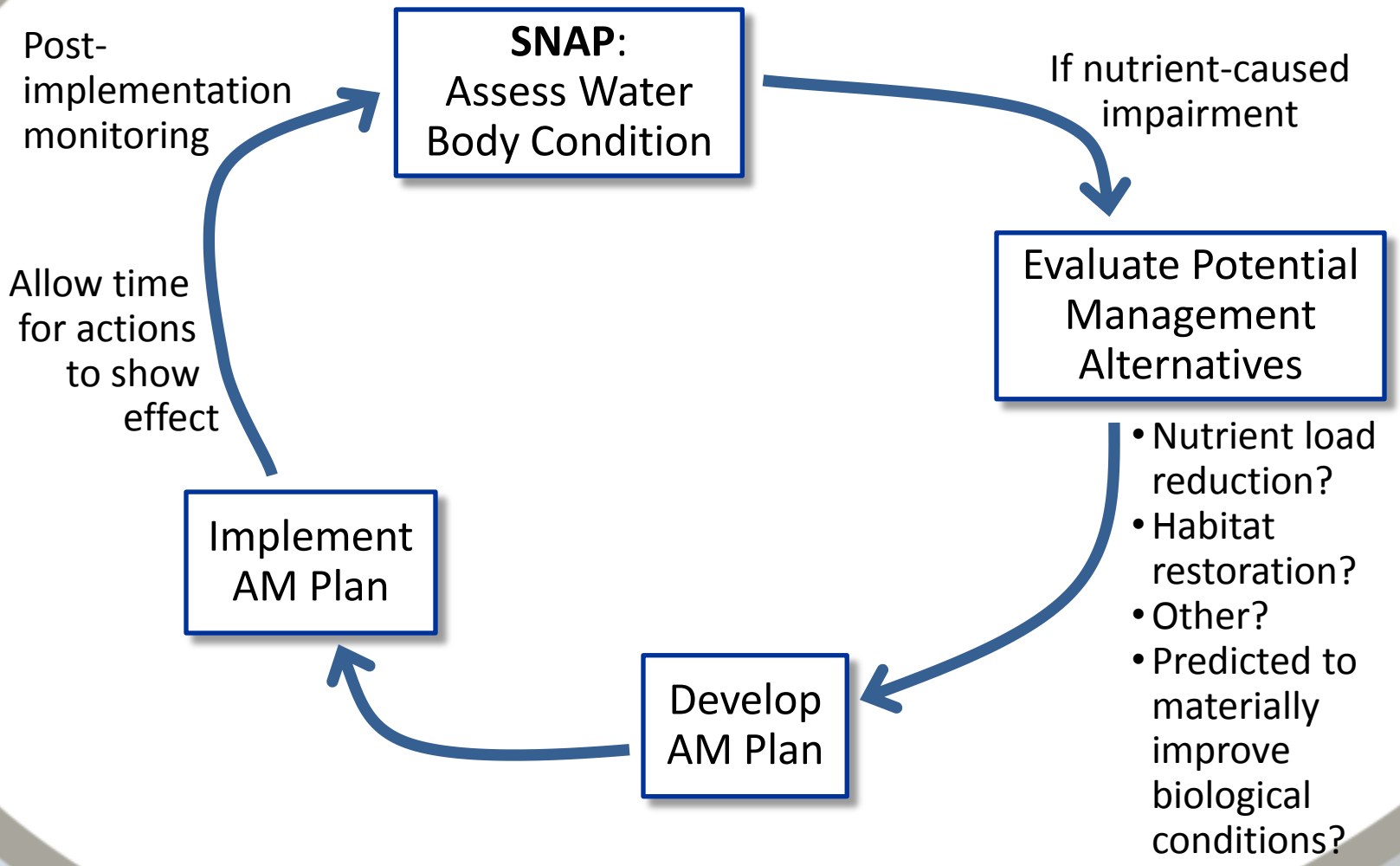
AM is an iterative process to design and implement cost-effective management actions to abate impairments to water quality caused in whole or part by nutrients

Adaptive Management (AM)

Because of uncertainty about causal and restorative links between aquatic biology, nutrients, and other stressors . . .

AM provides opportunity to design management alternatives

Adaptive Management



Adaptive Management Plans

- Developed by permittee, stakeholders, watershed partners.
- Becomes part of the PS NPDES permit and therefore enforceable.
- Updatable

TMDLs

- Need for Water Quality Targets
- New TMDLs based on outcome of SNAP
  - WLAs and LAs
- Existing TMDLs can be revisited
  - Anti-backsliding and antidegradation must be considered

Permit Limits & Conditions

- Permit limits imposed when:
  - SNAP assessment determines a nutrient impairment

  AND

  - Point-source reductions will materially improve the biology
- Components of AM Plan

Compliance Schedules

- Time to evaluate best and most cost effective treatment process modifications and/or alternative watershed phosphorus reduction actions
  - Adaptive Management Plans
  - Watershed management practices
  - Water Quality Trading
  - Watershed/Habitat Restoration

Translating to Permit Limits

- WLA used to determine growing season average permit limits
- Monthly limits set at a multiplier of the seasonal limit
- Daily permit limits not appropriate
- Weekly permit limits likely not appropriate

Questions ???

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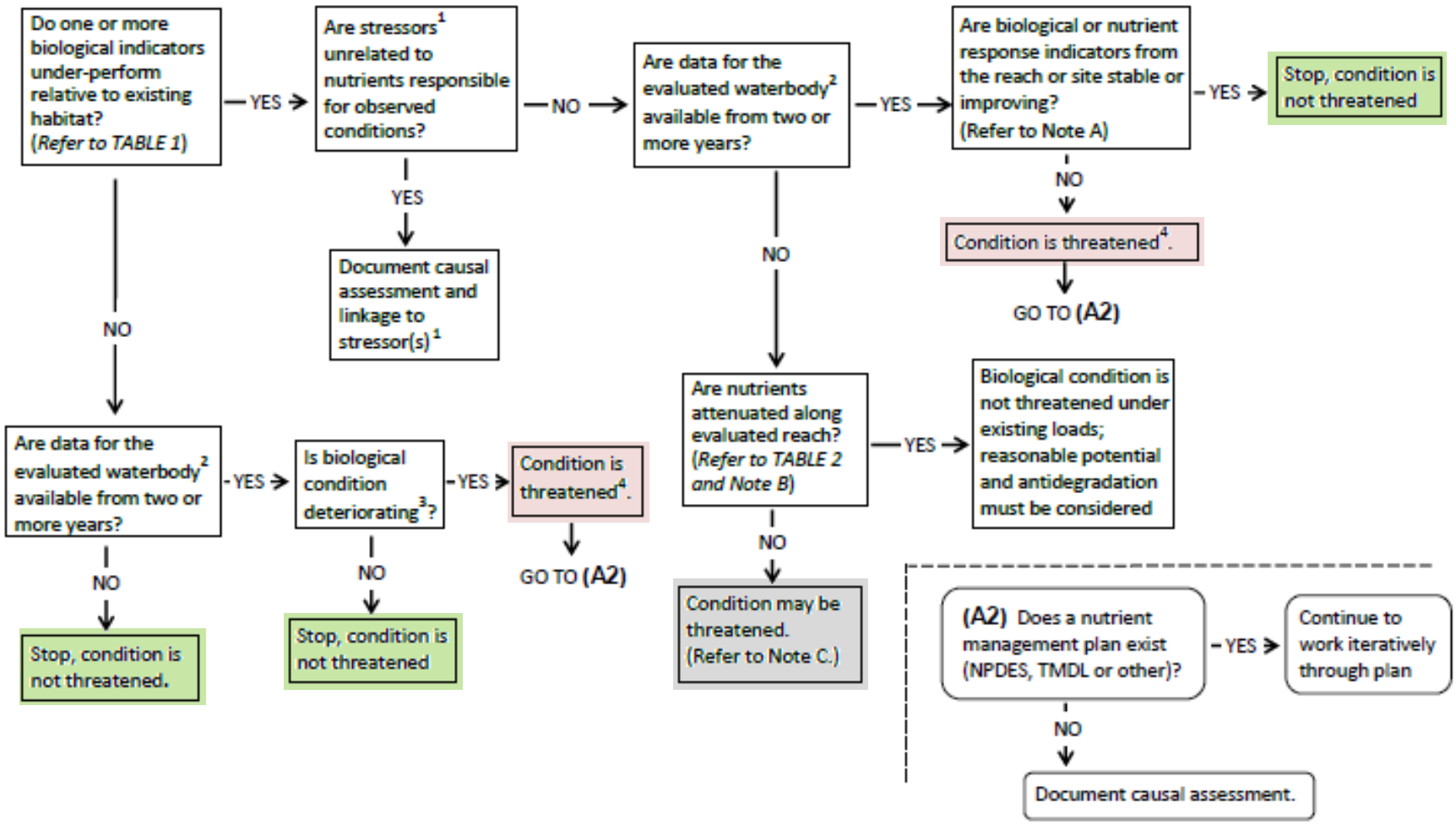
Stream Nutrient Assessment Procedure

SNAP FLOW CHARTS

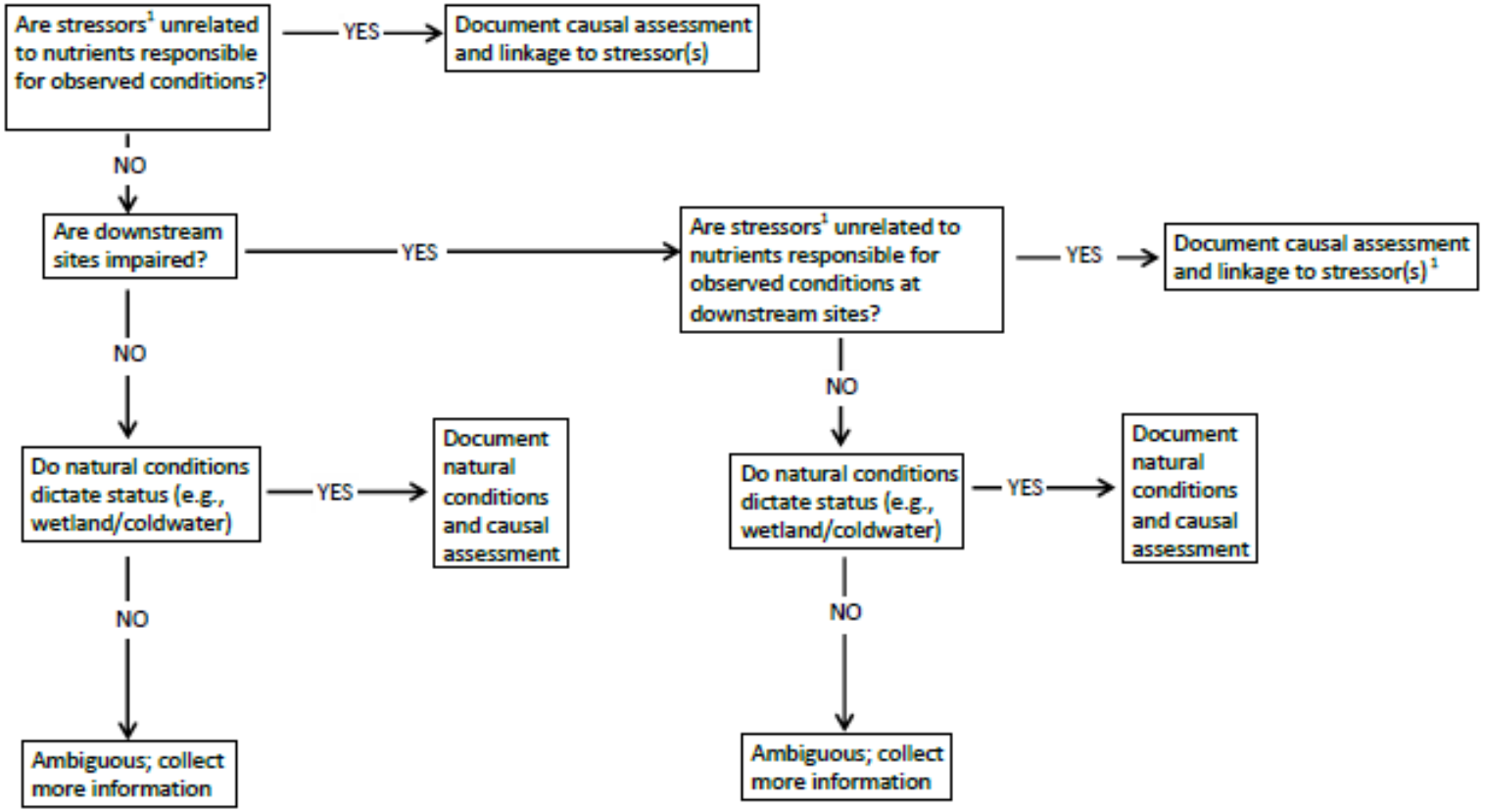
SNAP FLOW CHART A

Decision matrix for determining when biologically attaining condition status is threatened



SNAP FLOW CHART B

Decision tree for determining biological impairment caused by stressors other than nutrients



SNAP FLOW CHART C

Decision tree for confirming biological impairment caused by nutrients