

**Update on the Water
Quality Improvement Plans
of the Orange County MS4
Copermittees**

August 10, 2016

Acknowledgements

Copermittees

Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, San Juan Capistrano & County of Orange

Consultants

Geosyntec

Tetrattech

Brock Bernstein

Special Districts

Consultation Panel

Agenda

1. Introduction

- South Orange County Watershed Management Area
- WQIP – South Orange County

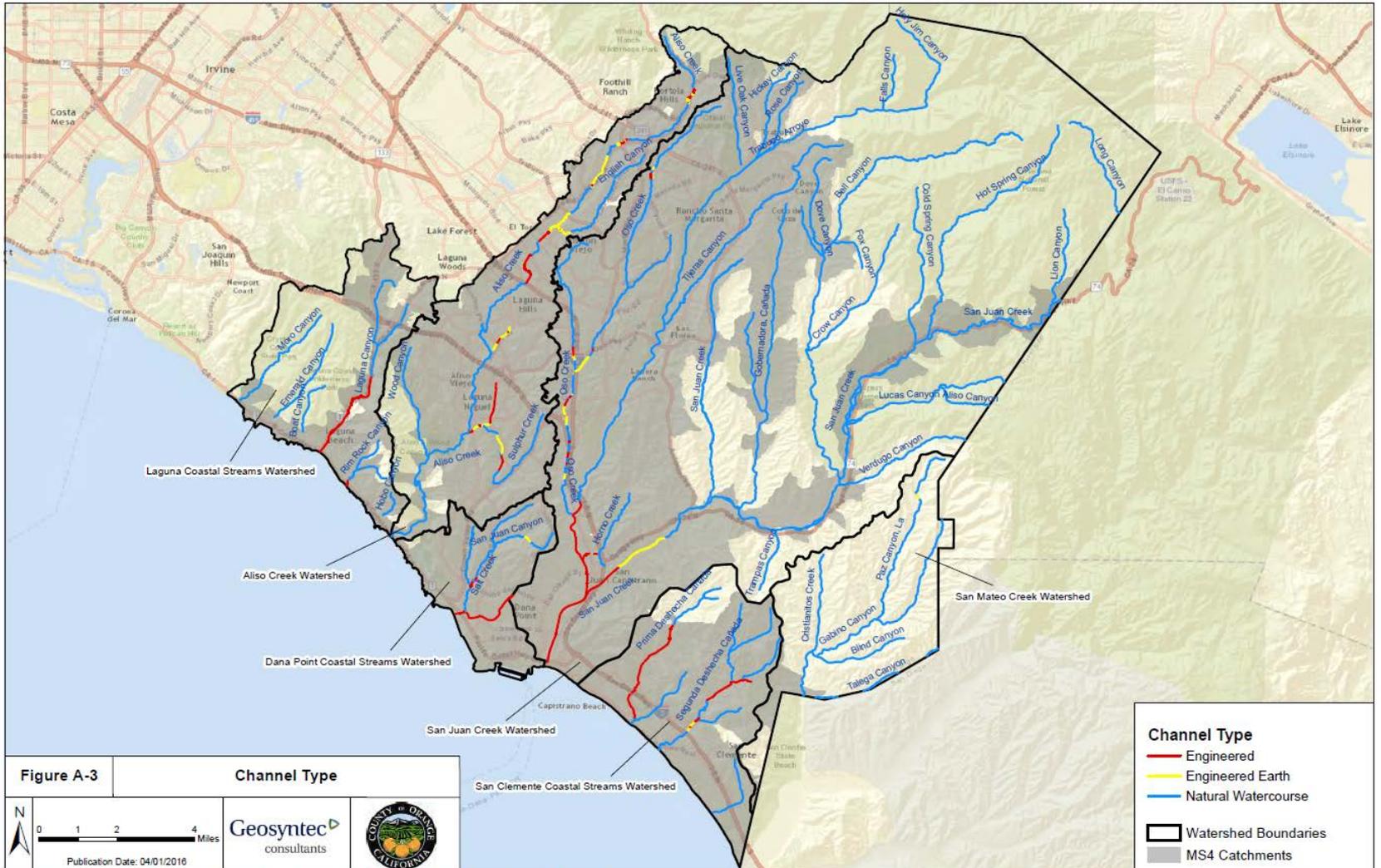
2. WQIP Status

- Regional Data Set
- Water Quality Conditions & Prioritization
- Interim Monitoring Program
- Candidate Strategies

3. Next Steps

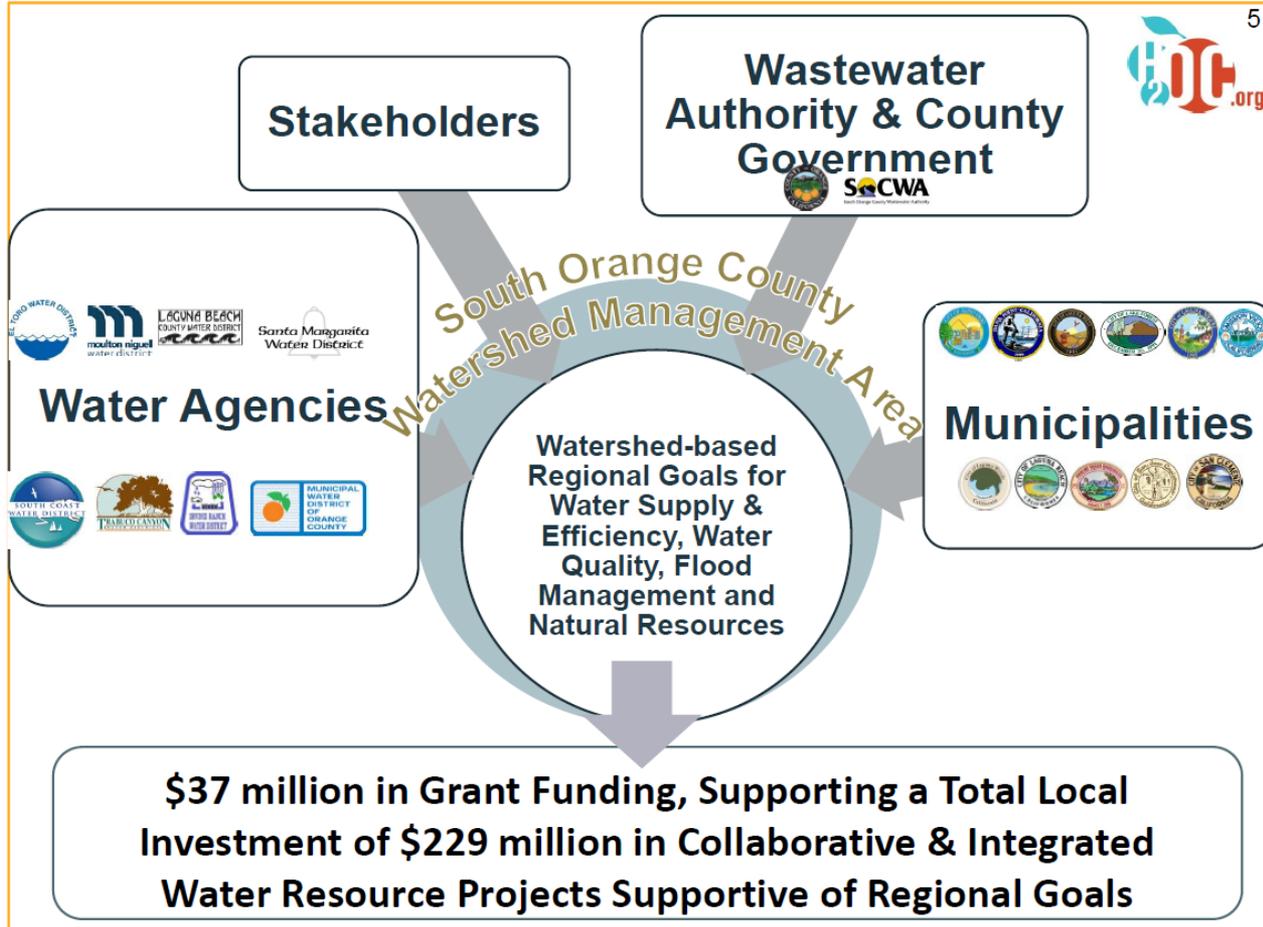
4. Questions

South OC Watershed Management Area (WMA) - Setting





South OC WMA – Pre- WQIP Coordination & Collaboration



WQIP – Status

B.2 - Priority Water Quality Conditions

- Priority and Highest Priority Conditions
- Temporal Extent
- Spatial Extent, if known
- Potential Strategies
- Criteria for determining and updating priorities based on future data



B.3 - Water Quality Improvement Goals, Strategies and Schedules

- Goals and Strategies, by watershed management area and jurisdiction
- Optional Watershed Management Area Analysis
- Modeling of strategies
- Schedules
- Prohibitions & Limitations Compliance Option

B.4 - Water Quality Improvement Monitoring and Assessment Program

- Ongoing monitoring during and following implementation
- Assessment of progress
- Input for adaptive management process

B.5 - Iterative Approach and Adaptive Management Process

- Re-evaluation of priority water quality conditions
- Adaptation of goals, strategies, and schedules
- Water Quality Improvement Plan updates, as needed



WQIP – Coordination & Stakeholder Engagement

- **Consultation Panel – 2 Meetings**

Name	Title	Affiliation
Christina Arias/Erica Ryan	Phase I MS4 Lead	RWQCB - SDR
Wayne Brown	Director of Government Relations	South OC Economic Coalition
Carolyn Cavecche	President and CEO	OC Taxpayers Association
Mark Grey	Technical Director	BIA-SC
Rick Wilson	Senior Staff Scientist	Surfrider
Laura Coley Eisenberg	Executive Director	The Reserve at RMV
Jonathan Witt	Senior Education Director	Ocean Institute
Sandra Jacobson	Coordinator	South Coast Steelhead Coalition
Wayne Rayfield	President	South Coast Water District

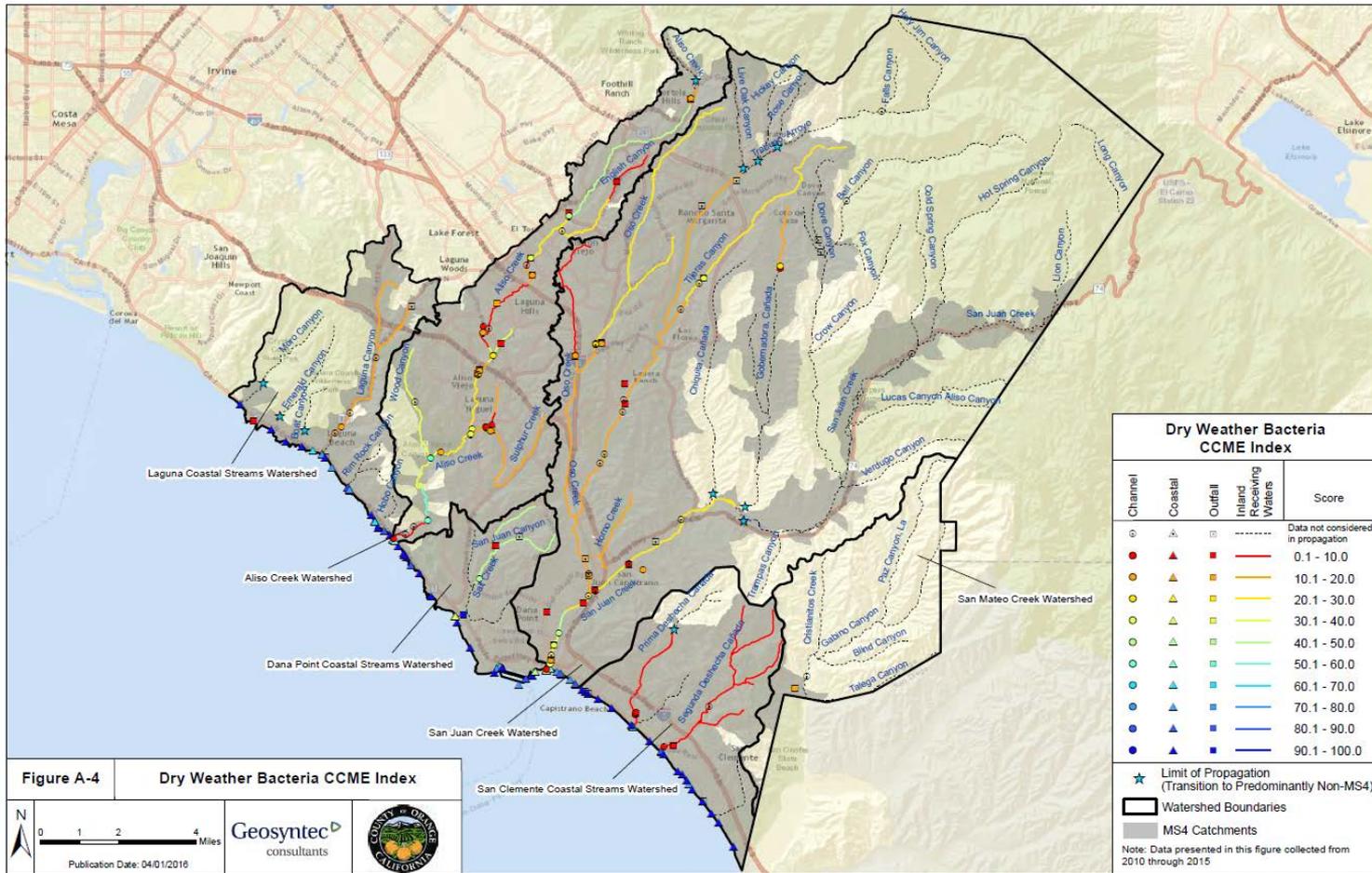
- **Public Meetings – 2 Meetings**
- **Copermittee Coordination - Monthly**
- **Ad Hoc Meetings**

WQIP Status

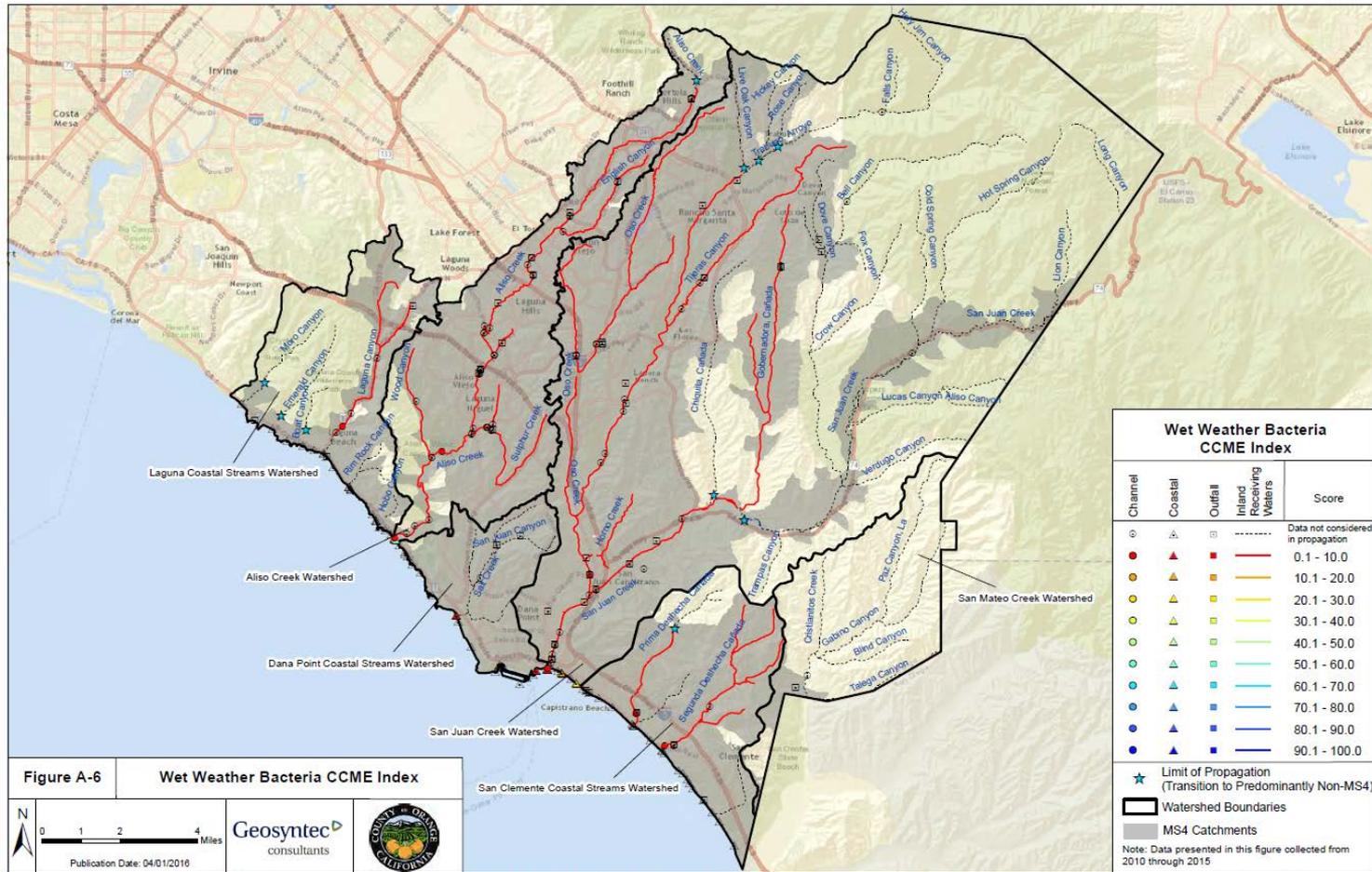
Regional Data Set Compilation

- Identified four “functional groupings”
 - Human health (bacterial indicators)
 - Eutrophication (nutrients)
 - Water quality related to biology (toxicity, TDS, pesticides, IBI)
 - Physical related to biology (hydromod, IBI, invasives)
- Created WQIP scores
 - Apply CCME exceedance index to water quality metrics
 - Apply biological integrity and algae index scoring methods
 - Subdivide scoring ranges as needed to create needed resolution for prioritization
 - Average scores within functional groups

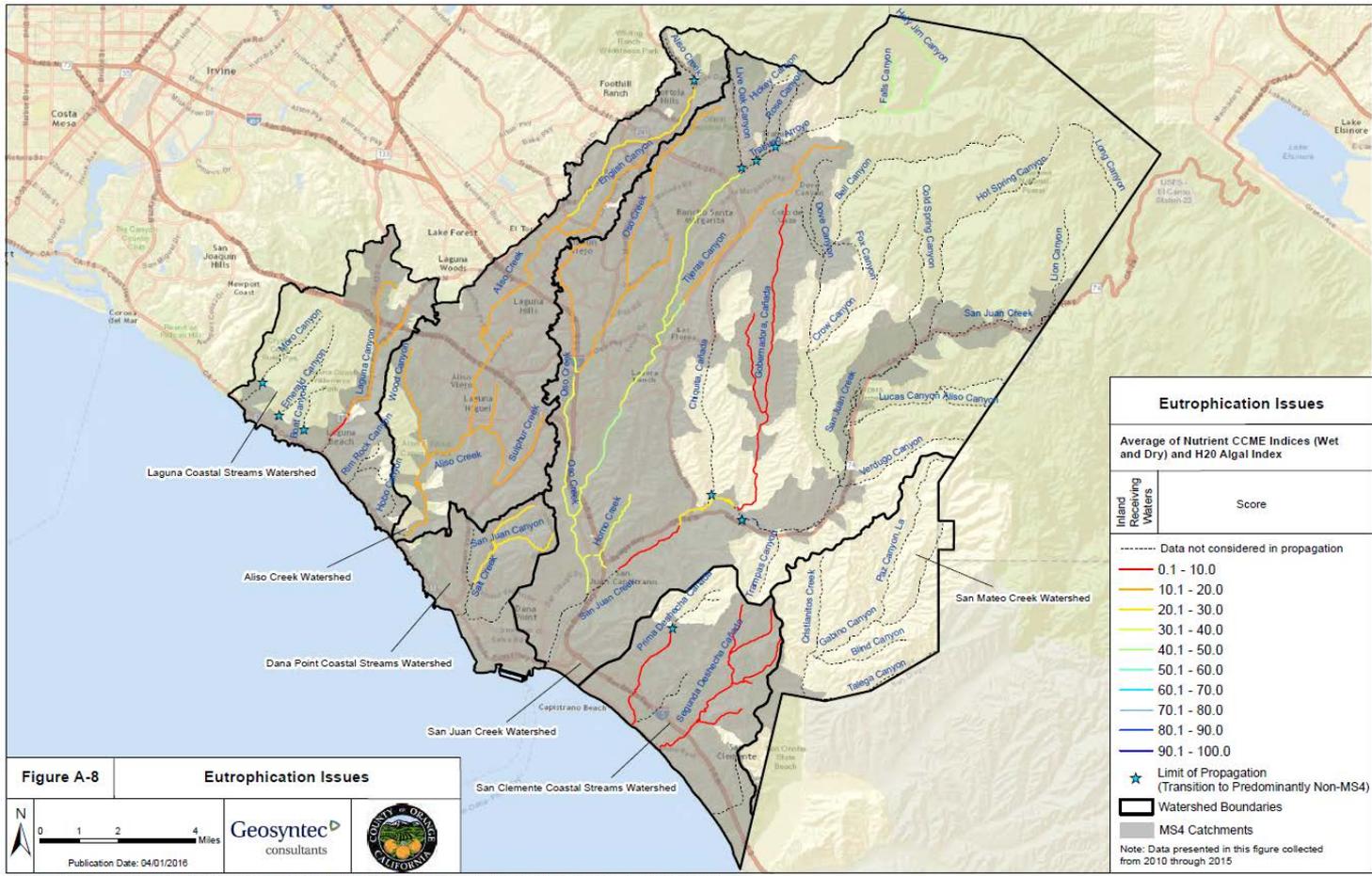
Regional Dataset Bacteria – Dry Weather



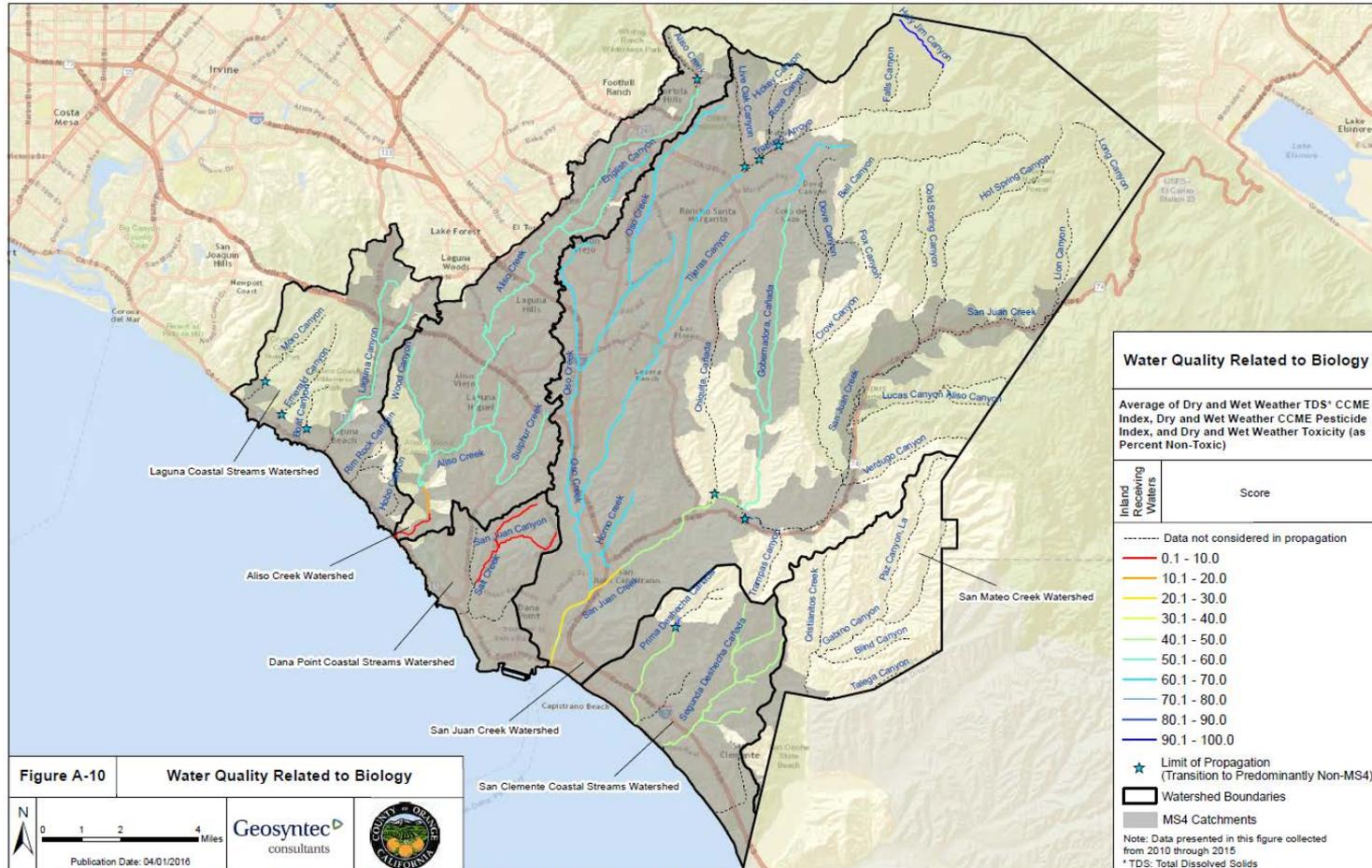
Regional Dataset Bacteria – Wet Weather



Regional Dataset Water Quality (Nutrients & Algae)



Regional Dataset Water Quality (TDS & Toxicity)



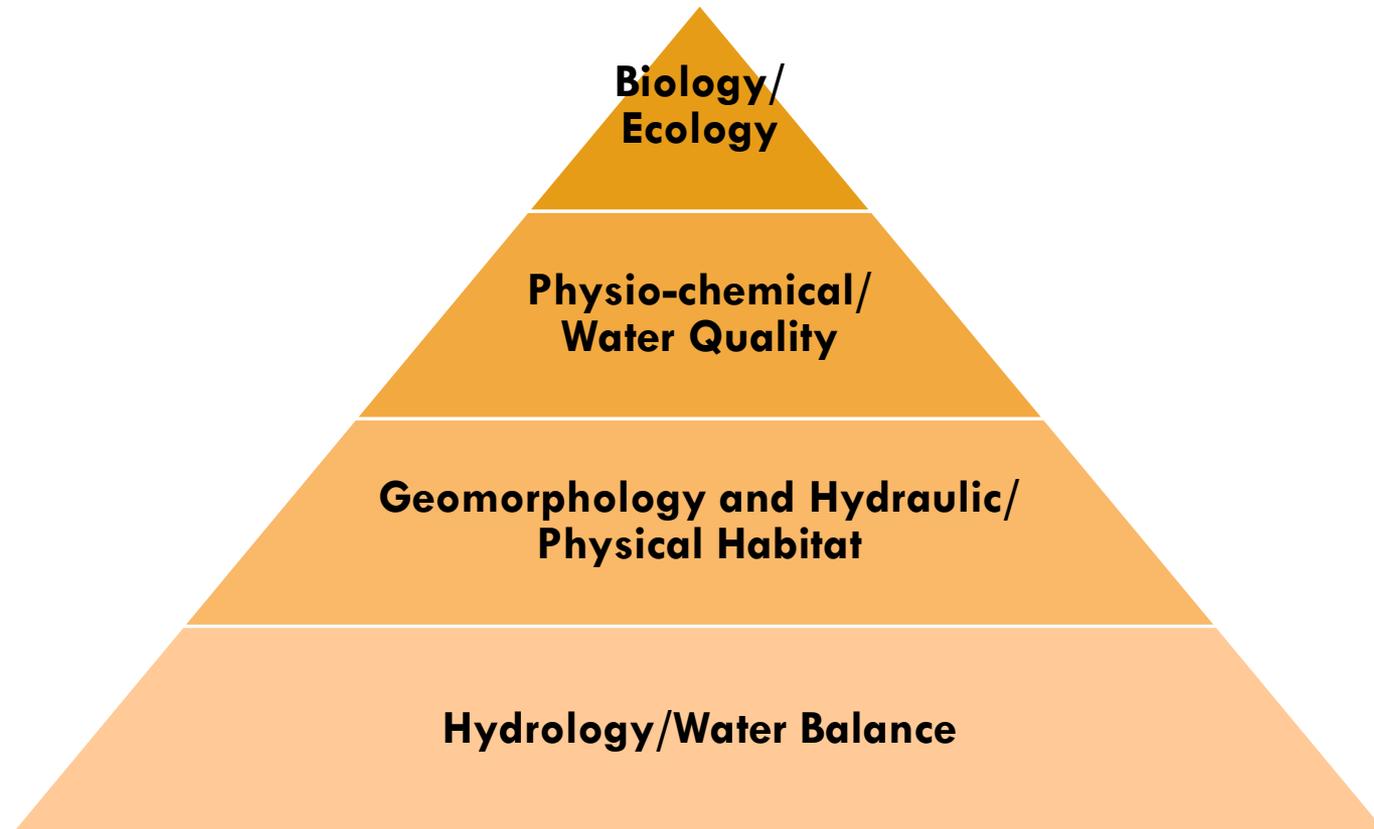
Source: Data provided by the San Mateo County Water Resources Agency (SWMARA). Data collected from 2010 through 2015. *TDS: Total Dissolved Solids

WQIP Status

Prioritization - Approach

- Developed regional dataset based on high-quality monitoring, mapping, planning, etc. resources
- Focused on system value and function related to MS4, not strictly on individual constituents, i.e., broader concept of “condition”
- Accounted for linkage to MS4, existing BMPs, high value areas
- Used “exceedance index” and other scoring approaches to produce consistent ranking method for comparing sites, reaches
- Applied decision rules to identify “priority” and “highest priority” conditions

Function-based Framework for Stream Restoration



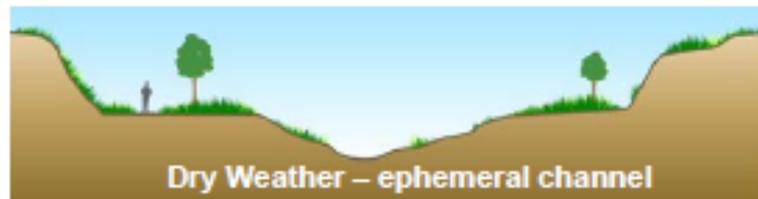
Adapted from:

A Function-Based Framework for Stream Assessment and Restoration Projects. Harman, W. et al.

and From Rain Tanks to Catchments: Use of Low-Impact Development To Address Hydrologic Symptoms of the Urban Stream Syndrome.

Asal Askarizadeh et al.

Inland Streams – Temporal Conditions



Most of the time (>90%)

Multi-use condition:

- Recreation
- Ecosystem functions
- Water quality (normally wet reaches)



Some of the time (<10%)

Multi-use condition:

- Ecosystem functions
- Geomorphic functions
- Water quality
- Flood control



Very infrequent (1%)

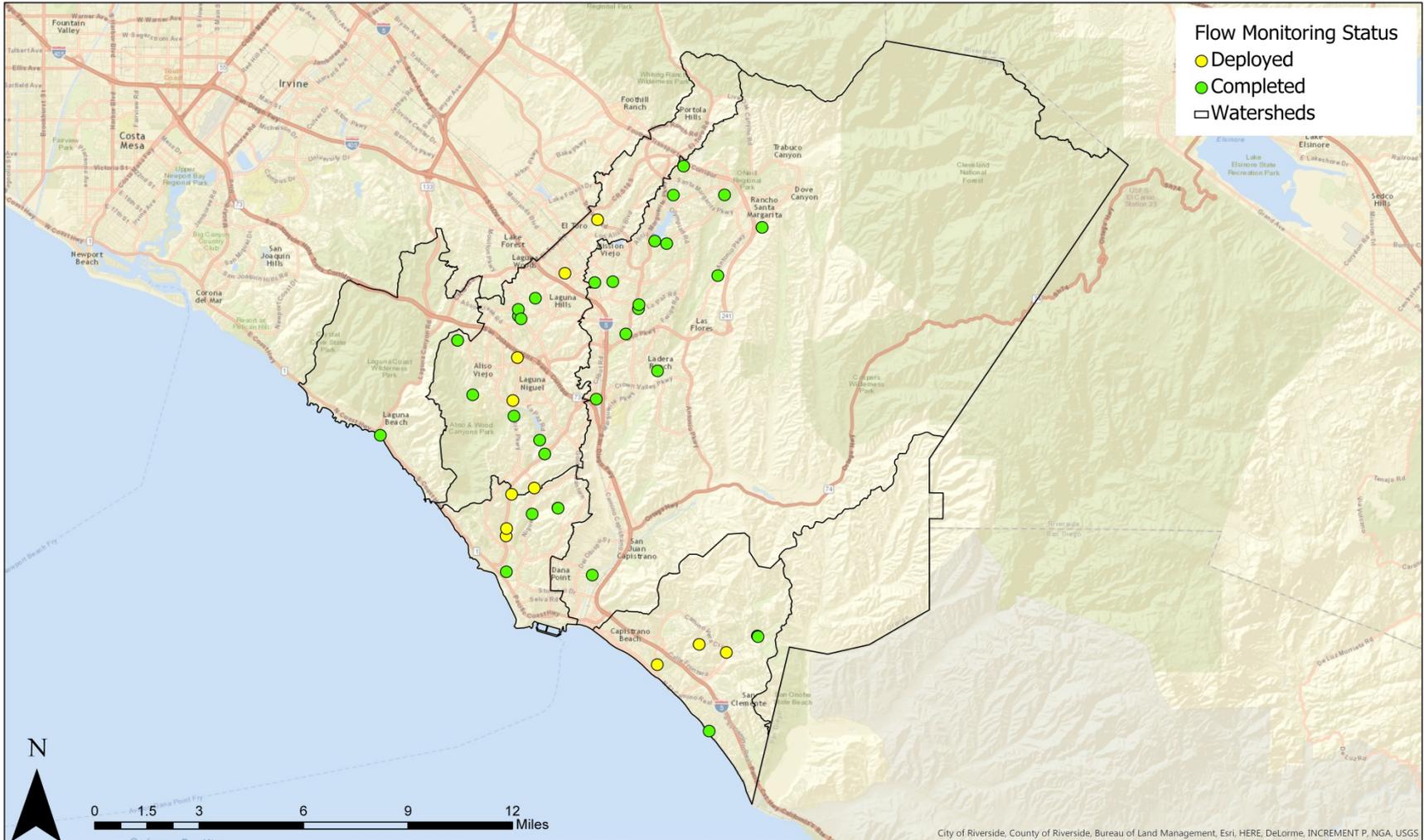
Single-use condition:

- Flood control
- Public safety

Highest Priority Water Quality Conditions

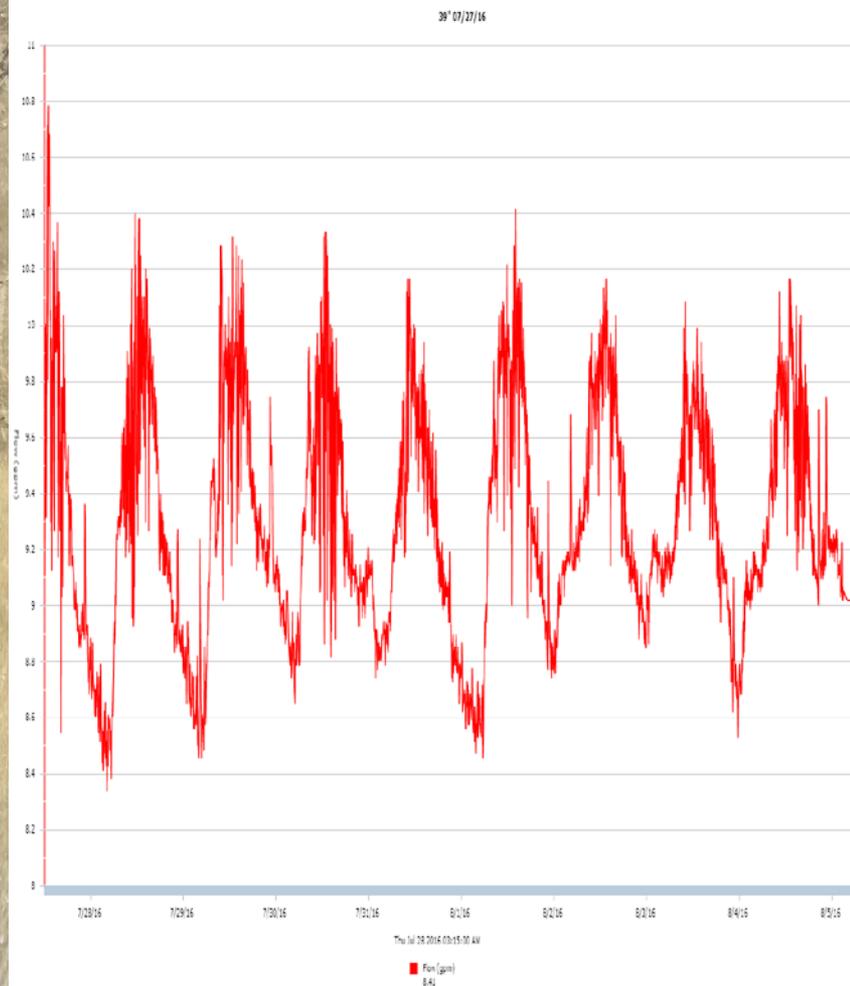
Condition	Temporal Extent	Geographic Extents (or narrative criteria for future effort to define geographic extent)
Pathogen Health Risk	Dry/Wet	Beaches <ul style="list-style-type: none"> ○ Where recreational use/high value and persistent exceedances of FIB standards (limited extent in dry; most beaches during wet)
Unnatural Water Balance/Flow Regime	Dry	Stream Reaches <ul style="list-style-type: none"> ○ Reaches and outfalls demonstrated to be ponded or flowing in dry weather ○ Areas with other observed issues exacerbated by unnatural water balance (e.g., low IBI, high eutrophication, high “invasives”) ○ Areas with highest intensity of recreational use/visibility
Channel Erosion/ Geomorphologic Impacts	Wet	Stream Reaches <ul style="list-style-type: none"> ○ Where degraded channel form has become limiting factor in channel ecology ○ Areas with highest intensity of recreational use/visibility ○ Where sediment or particulate-bound pollutants contributing to downstream WQ impairment

Interim Monitoring Investigating Dry Weather Discharges



Outfall Flow Monitoring Locations

Interim Monitoring Monitoring Dry Weather Discharges



Candidate Strategies - Nonstructural

Strategy	Human Health Risk	Unnatural Water Balance/ Flow Regime	Channel Erosion/ Geomorphologic Impacts
Non-Structural Strategies			
Identification and Control of Sewage Discharge to Participating Agency Storm Drain Systems	2	1	0
Homelessness Waste Management Program	2	0	0
Onsite Wastewater Treatment Source Reduction	2	1	0
Irrigation Runoff Reduction and Good Landscaping Practices	1	2	0
Commercial, Industrial, and Residential Good Housekeeping	1	1	0
Pet Waste Program	2	0	0
Animal Facilities Management	2	1	0
Redevelopment and WQMP Implementation (Source Control, LID, Hydromodification)	2	1	1
Street and Median Sweeping	1	0	0
Storm Drain Cleaning	1	0	0
Special Studies and Site Specific Objectives	2	1	1

Key to Ranking

2: Direct and significant nexus to HPWQC

1: Partial nexus or partial contribution to HPWQC

0: No significant nexus to HPWQC

Candidate Strategies - Structural

Strategy	Human Health Risk	Unnatural Water Balance/ Flow Regime	Channel Erosion/ Geomorphologic Impacts
Structural Strategies			
Watercourse Rehabilitation	1	0	2
Residential/Small-Scale Low Impact Development Incentive Program	2	2	1
Infiltration BMPs	2	2	1
Water Supply Augmentation	1	2	0
Capture and Use, or Rainwater Harvesting	1	2	0
Natural Treatment or Filtration	2	0	1
Advanced Treatment and Proprietary Devices	2	0	0
Infrastructure Improvement and Ancillary/Source Control BMPs	1	1	0
Pretreatment BMPs	1	1	0
Retrofits for Priority Conditions	2	2	1
Nuisance Water Diversions	2	2	0
Catch Basin Retrofits	1	0	0

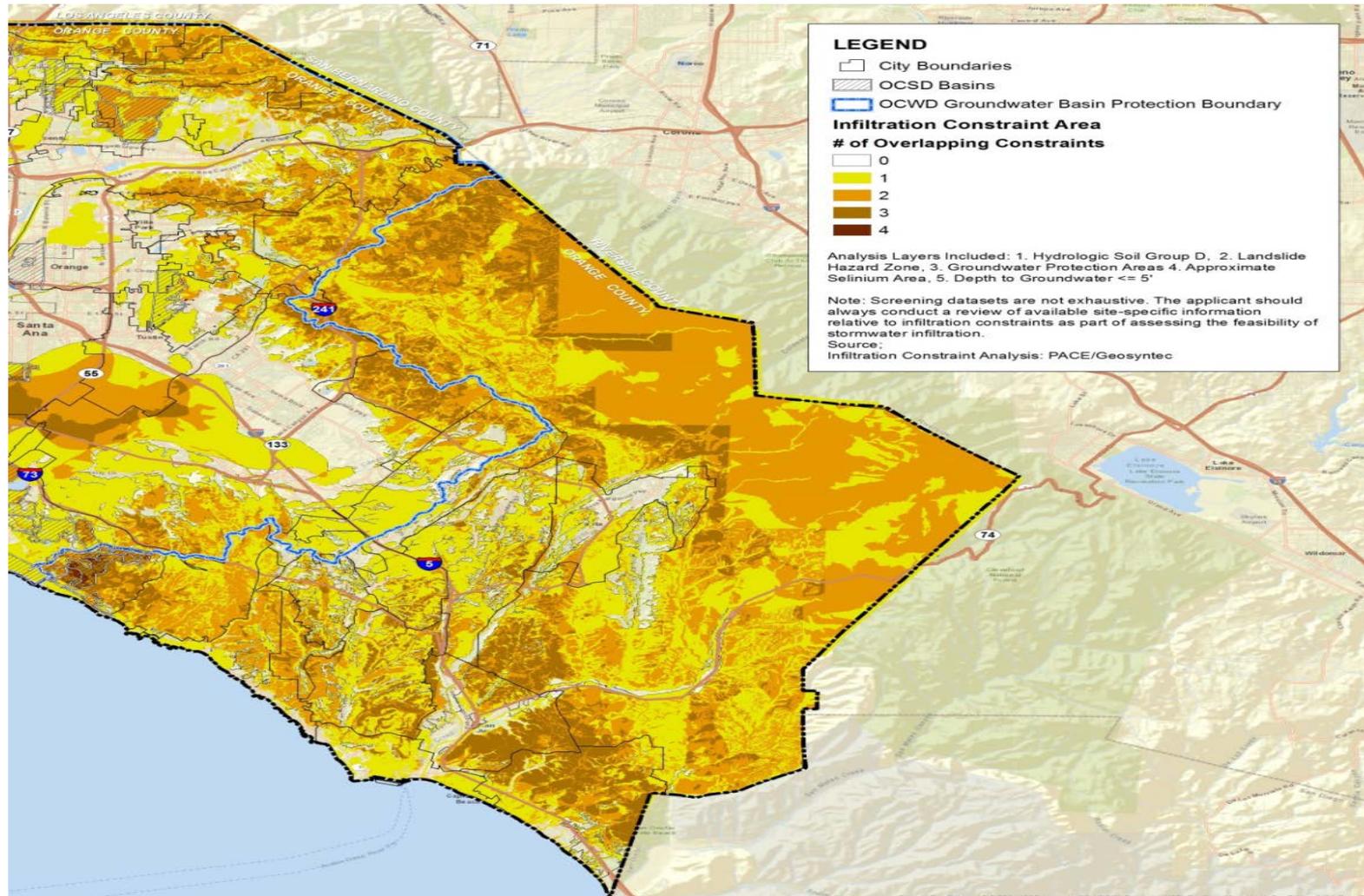
Key to Ranking

2: Direct and significant nexus to HPWQC

1: Partial nexus or partial contribution to HPWQC

0: No significant nexus to HPWQC

Infiltration



Flood Control



Restoration



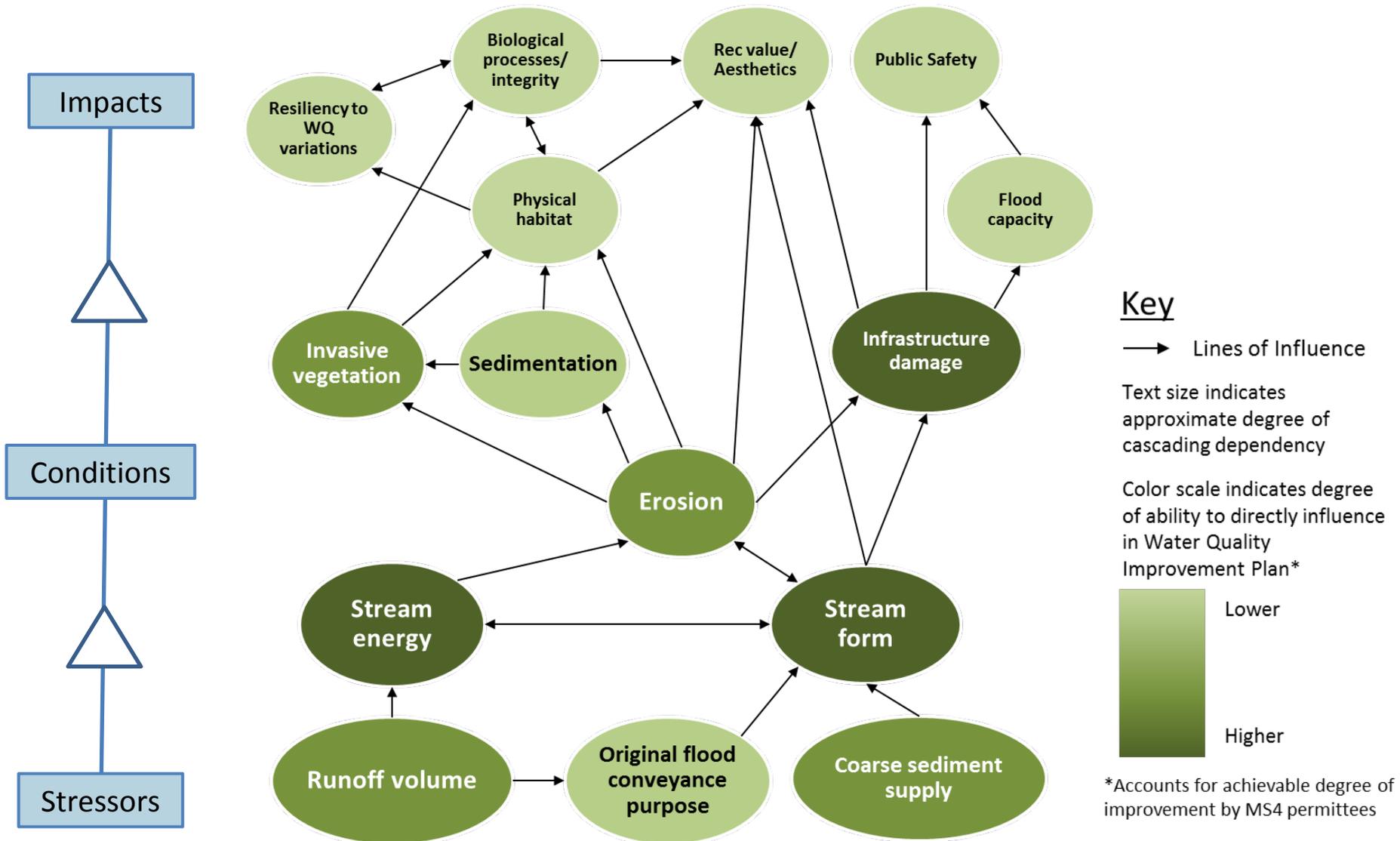
Next Steps

- Consultation Panel
- Public Meeting
- Submittal of B.3 Report on October 1st

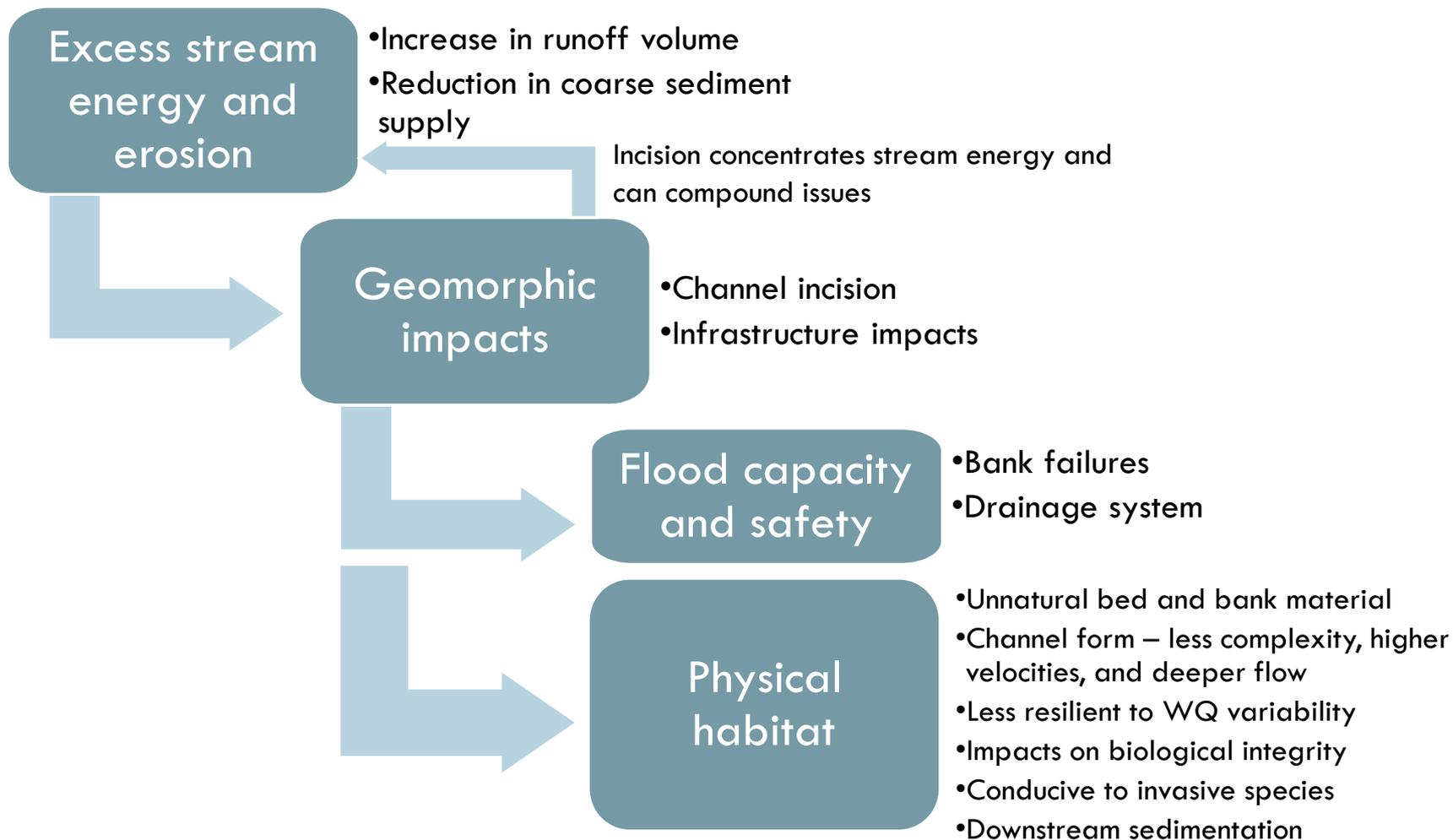


Questions?

Conceptual Relationships – Wet Weather Stream Functions



Inland Streams – Wet



Evaluation of Conditions

- Review of data and indices
- Spatial and temporal relationship of conditions
- Known interdependencies between pollutants, stressors and receiving water conditions
- Relationship to resource values/uses

Data Inputs to Develop Index-Based Scoring of Conditions for Dry and Wet Weather

Water Quality –
Human Health
Risk

- Index for FIB

Water Quality –
Receiving Water

- Index for nutrients
- Algae
- Metals

Water Quality -
Biological Impacts

- Indices:
- TDS
- Pesticides
- Toxicity
- IBI

Physical –
Biological Impacts

- Impervious cover
- IBI
- Macro-scale observed hydromod impacts
- Invasive species
- Trash

Priority vs. Highest Priority Conditions

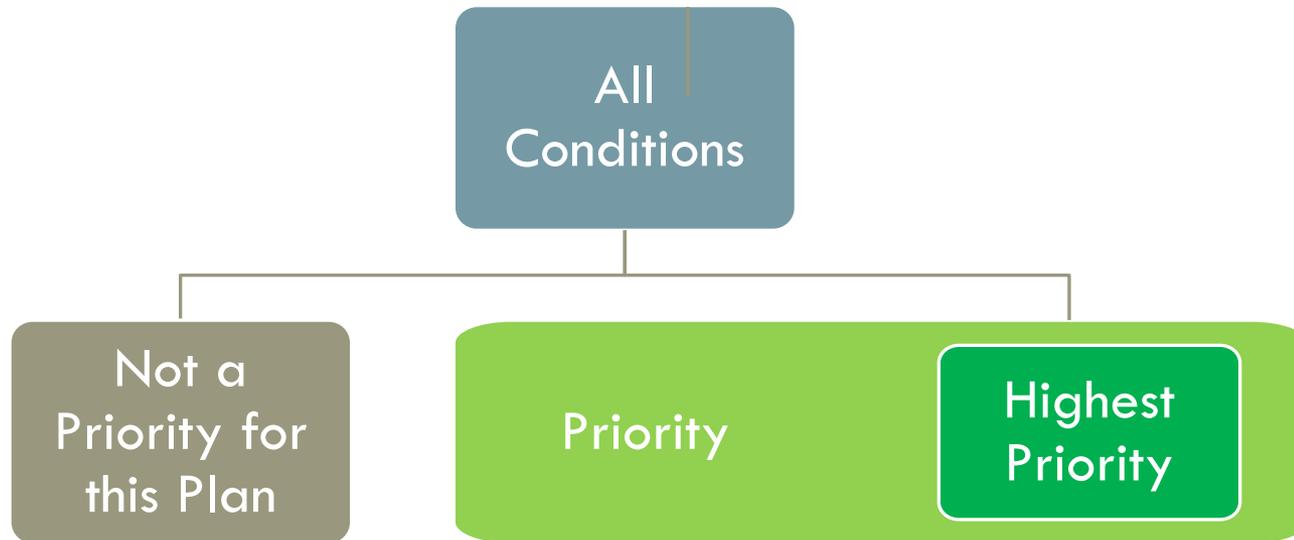
Coastal Receiving Waters

- Indicator bacteria are predominant WQ issue
- Direct relationship to recreational beneficial use
- Human pathogen health risk is a clear highest priority

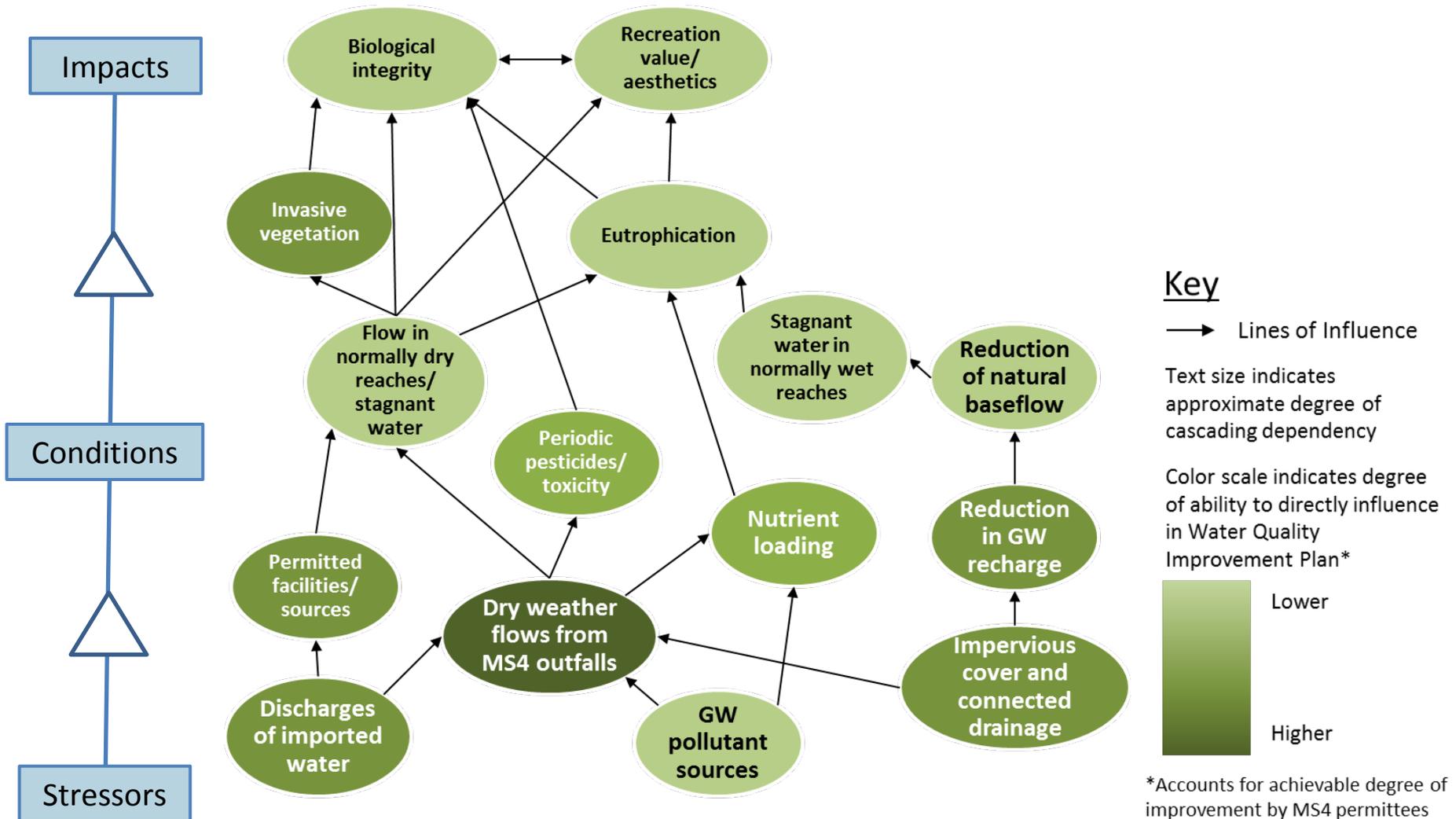
Inland Streams

- Range of priority conditions related to flow, water quality, physical habitat, biological integrity, and geomorphology
- Conditions highly interrelated at a given reach and between upstream and downstream reaches
- Only a subset of conditions is related to MS4 and possible for MS4 to control

Prioritization Of Conditions



Conceptual Relationships – Dry Weather Stream Functions



Dry Weather HPWQC – Inland Streams

HPWQC

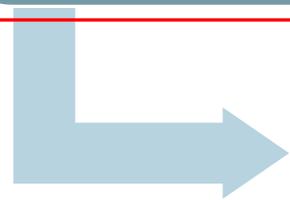
Unnatural water balance

- Imported water
- Dry weather discharges and associated nutrient loads
- Reduction in GW recharge



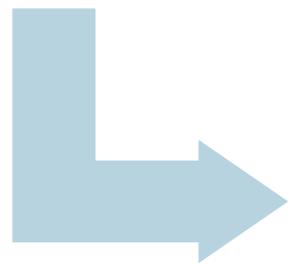
Unnatural stream flow regime

- Persistent flow or stagnant water in normally dry reaches
- Reduced baseflow in normally wet reaches



Eutrophication

- Temperature
- Less ability to assimilate natural nutrient loads
- Nuisance conditions and WQ impacts



Low Biological Integrity

- WQ impacts related to eutrophication (e.g., DO, algae)
- Unnatural ecosystem; greater sensitivity to WQ variability
- Susceptible to invasive species
- Low aquatic species diversity