PUGET SOUND
National Estuary Program

Integrating LIO information in Implementation Strategy development

Synthesis for Starter Package | Marine Water Quality April 2019

Marine Water Quality (MWQ) Target

- Dissolved oxygen in marine waters, which is currently below its 2020 target and has insufficient or no data available on its progress.

Key Take-Aways

Note: There are 10 LIOs total, but only 9 have LIO Plans as of Feb. 2019

How many LIOs are addressing Marine Water Quality (MWQ)?

- ✓ 9 of 9 LIOs identify MWQ in their Ecosystem Recovery Plans
- ✓ 4 of 9 selected a priority for MWQ, either Very High or High.
- ✓ 3 of 9 LIOs identified quantitative goal statements. Most are focused on meeting current water quality standards.
- ✓ 8 of 9 LIOs identified strategies to address MWQ. Data from Whatcom LIO was not available when this synthesis product was prepared. Follow-up with the Whatcom LIO coordination is recommended.

What are the common pressure sources and stressors degrading MWQ?

- ✓ Pressure sources and stressors related to pollutant inputs to Puget Sound were the most common across LIO Plans and are shared across the region.
  - **Pressure Sources:** 7+ Plans identified runoff from residential & commercial lands, & housing & urban areas.
  - **Stressors:** 8 of 9 Plans identified non-point source, non-persistent toxic chemicals in aquatic systems and non-point source conventional water pollutants.

What strategies and near-term actions (NTAs) are LIOs using to make progress on MWQ?

- ✓ 65 of 74 strategies are focused on one or more of the following:
  - Prevent or manage pollution / stormwater runoff (6 of 9 LIOs; 28 of 74 strategies)
  - Implement plans or regulations locally (6 of 9 LIOs; 26 of 74 strategies)
  - Conduct outreach, education, and stewardship (7 of 9 LIOs; 21 of 74 strategies)
- ✓ Over half of the 337 NTAs are not categorized by the type of action they represent. Where NTAs are categorized:
  - Enabling conditions is the most common (selected 107 of 411 times), and 37% of those selections are focused on recovery design and planning.
  - This trend is driven by the Hood Canal, Snohomish-Stillaguamish, West Central, and Strait LIOs, each of which identified their NTAs as enabling conditions 22-24 times.

About this synthesis

Purpose: Integrate LIO Plan information into implementation strategy development
Key audience(s): Implementation strategy teams

This document provides implementation strategy teams with a snapshot of Local Integrating Organization (LIO) strategies, priorities, challenges, and contributions to ecosystem recovery for a particular Vital Sign. It synthesizes readily available information from LIO ecosystem recovery plans (LIO Plans), which is housed in Miradi and is current as of 2/15/2019. LIOs have reviewed and approved this document. Continued engagement with LIOs is necessary to ensure this synthesis is correctly interpreted and used.

LIO Plans are vetted and approved documents that guide and communicate local recovery. With this synthesis and other similar analyses, the Plans are used to communicate to regional decision makers and planners. LIO Plans were developed and are adaptively managed through a robust technical and stakeholder engagement process. Note that salmon recovery efforts and ongoing programs are not represented in this synthesis unless LIOs included them in their Plans.

LIOs identifying Marine Water Quality

Check mark = identified in LIO Plan
Priority, if assigned, is shown in parentheses

Anywhere in LIO Plan	In 1+ Strategies
✓ Hood Canal	✓ Hood Canal
✓ Island (Very high)	✓ Island
✓ San Juan	✓ San Juan
✓ Snohomish-Stillaguamish (High)	✓ Snohomish-Stillaguamish
✓ South Central	✓ South Central
✓ South Sound	✓ South Sound
✓ Strait (High)	✓ Strait
✓ West Central (Very high)	✓ West Central
✓ Whatcom	✓ Whatcom

Summary of Pressure Sources and Pressure Stressors Affecting Marine Water Quality across LIOs

- The pressure sources and stressors below were identified in at least 6 of 9 LIO Plans. Most focus on pollutant inputs to Puget Sound from land development and wastewater to make progress on the MWQ Vital Sign.
- Unique among LIOs, Hood Canal identified three climate change-related pressure stressors as affecting MWQ: changing precipitation amounts and patterns; sea level rise; and, changing ocean conditions.
- Of the seven pressure sources LIOs commonly identified in their Plans, only one was also common in strategies. This may suggest that while reducing all of these pressure sources is viewed as important to improving marine water quality, only "runoff from residential and commercial lands" is widely seen as actionable at the local level and/or as a near-term priority for action. Further discussion with LIO Coordinators is recommended to discuss these findings.
- Several pressure sources and pressure stressors do not appear to be strongly linked to the MWQ Vital Sign and may reflect a less direct effect on MWQ, a desire to convey the integrated nature of the ecosystem, an unintended consequence of how Miradi is formatted, or unvetted data steward choices. Further discussion with LIO Coordinators is recommended.

Consider:

- Lack of a strategy does not indicate importance. Why might an LIO not have a strategy addressing a pressure? Is there a place where regional efforts can support? Is there important sequencing that must occur? Is there something unique about one or more LIOs, such as having a large proportion of rural landscapes and pressure sources/stressors unique to those landscapes, that may not be obvious from this summary across LIOs? Are there certain pressure sources that are more relevant to specific watersheds than regionally?
- Which pressure sources or stressors differ from what is in the IS and could be considered for inclusion or expansion in the IS?
- Some LIOs chose not to prioritize, for various reasons. Please refer to the LIO Plans for more information.

Pressure sources

Pressure source identified as:	*A priority*	*A priority addressed with strategies*	*A priority not addressed with strategies*	*Not prioritized*
09.1.2: Runoff from residential and commercial lands	8	7	1	1
01.1: Housing & Urban Areas	7	5	2	2
01.2: Commercial & Industrial Areas (Including Ports)	6	3	3	3
04.3: Shipping Lanes and Dredged Waterways	6	2	4	3
09.1.1.1: Domestic & Municipal Wastewater to Sewer	6	2	4	3
09.2.1: Oil Spills	6	3	3	3
09.3: Agricultural & Forestry Effluents	6	4	2	3
# LIOs	9	9	9	9

Pressure stressors

Pressure stressor identified as:	*Addressed with strategies*	*Not addressed with strategies*
22.2: Non-point source, non-persistent toxic chemicals in aquatic systems	8	1
24.2: Non-point source conventional water pollutants	8	1
10.1: Altered peak flows from land cover change	7	2
21.2: Non-point source, persistent toxic chemicals in aquatic systems	7	2
24.3: Changes in water temperature from local causes	6	3
# LIOs	9	9

Summary of Strategies and NTAs Supporting Marine Water Quality across LIOs

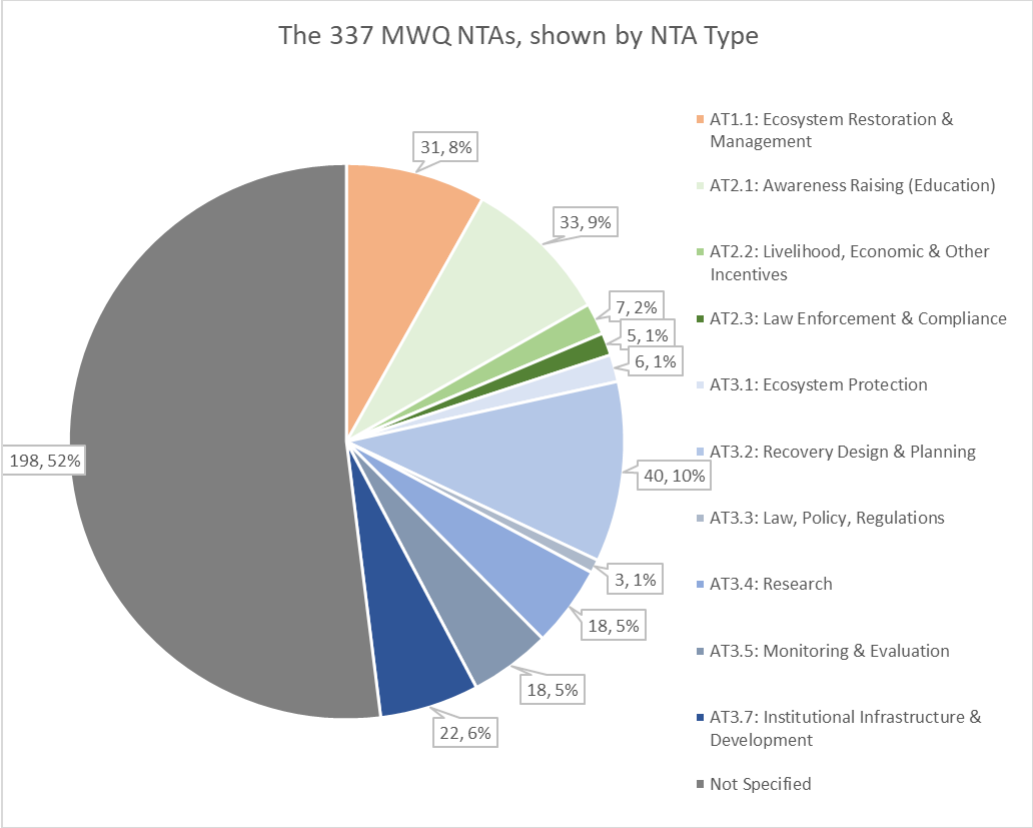
- Of the 74 strategies supporting the MWQ VS across LIOs, 43 unique strategies address the most common pressure sources LIOs identified. Most strategies are either used by multiple LIOs or address multiple pressure sources within an LIO, as implied in the first table below.
- Most strategies are focused on preventing or managing pollution / stormwater runoff, implementing plans or regulations locally, and outreach, education, and stewardship (see second table below).
- Two of the Action Agenda sub-strategies were especially popular across LIOs:
  - To manage urban runoff (sub-strategy 10.1), South Central and West Central LIOs are using the Action Agenda sub-strategy; Hood Canal and Snohomish-Stillaguamish LIOs are using very similar strategies.
  - To provide focused stormwater-related education, training, and assistance (sub-strategy 10.5), Island, Snohomish-Stillaguamish, South Central, and West Central LIOs are using the Action Agenda sub-strategy. South Central LIO also specifically identified "Puget Sound Starts Here" as an awareness-raising effort. Hood Canal LIO focuses their outreach and education on water quality more broadly.
- There is local variation in how LIOs are using strategies to address marine water quality:
  - Only the South Central and West Central LIOs explicitly focus on new or existing development
  - Only the San Juan, Strait, and West Central LIOs explicitly focus on oil spill preparedness and response
  - Several LIOs have identified landscape-focused strategies, with the Island LIO focusing specifically on reducing pollutants from working farms and the West Central LIO identifying habitat restoration or conservation as strategies. The Strait and Snohomish-Stillaguamish LIOs each had one strategy focused on restoration or conservation as well.
- Note that Whatcom LIO strategies were not accessible in Miradi Share at time of this synthesis preparation. Follow-up with the Whatcom LIO coordinator is recommended.

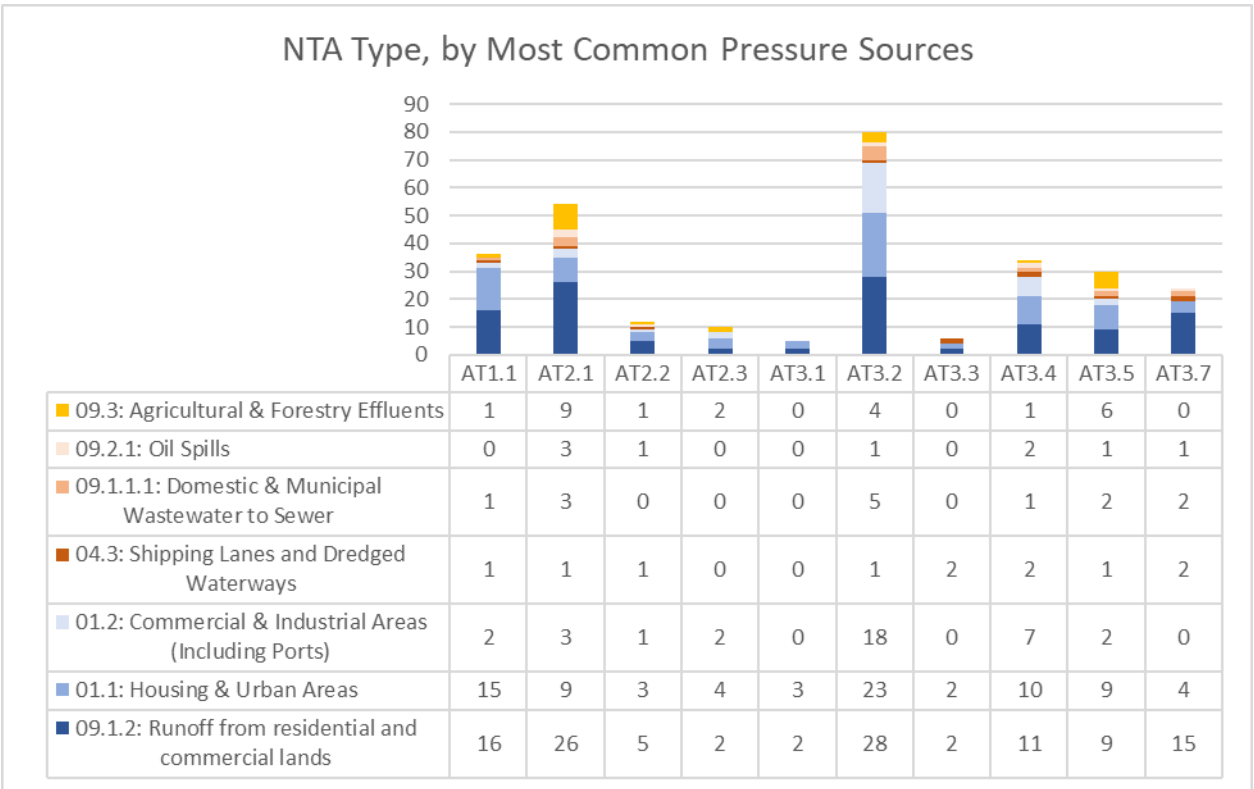
Pressure source	# strategies	# NTAs
09.1.2: Runoff from residential and commercial lands	38	148
01.1: Housing & Urban Areas	26	93
01.2: Commercial & Industrial Areas (Including Ports)	9	57
04.3: Shipping Lanes and Dredged Waterways	11	17
09.1.1.1: Domestic & Municipal Wastewater to Sewer	4	46
09.2.1: Oil Spills	7	14
09.3: Agricultural & Forestry Effluents	14	40
Total # MWQ VS strategies or NTAs	184	415

Please Note:
This synthesis includes some 2018 NTAs. Also, NTAs are the primary activities captured in Miradi at this time. Other critically important activities such as local ongoing programs are not captured and therefore are not reflected in this LIO synthesis.

	Summary (# strategies)	Summary (# LIOs)	Hood Canal	Island	San Juan	Snohomish-Stillaguamish	South Central	South Sound	Strait	West Central	Whatcom
Prevent pollution / stormwater runoff	18	6	•	•			•	•	•	•	
Manage pollution / stormwater runoff	10	4	•			•	•			•	
Develop plans or regulations	7	4	•	•		•				•	
Implement plans or regulations	26	6	•	•			•	•	•	•	
Outreach, education, and stewardship	21	7	•	•		•	•	•	•	•	
Prevent new development	6	2					•			•	
Fix problems caused by existing development	6	3		•			•			•	
Oil spill preparedness / response	8	3			•				•	•	
Habitat restoration / conservation	7	3				•			•	•	

Summary of Strategies and NTAs Supporting Marine Water Quality across LIOs *(continued)*

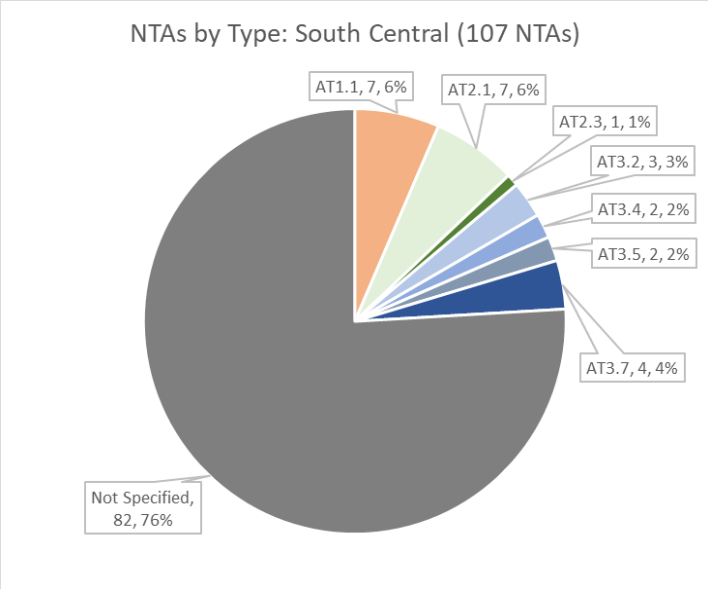


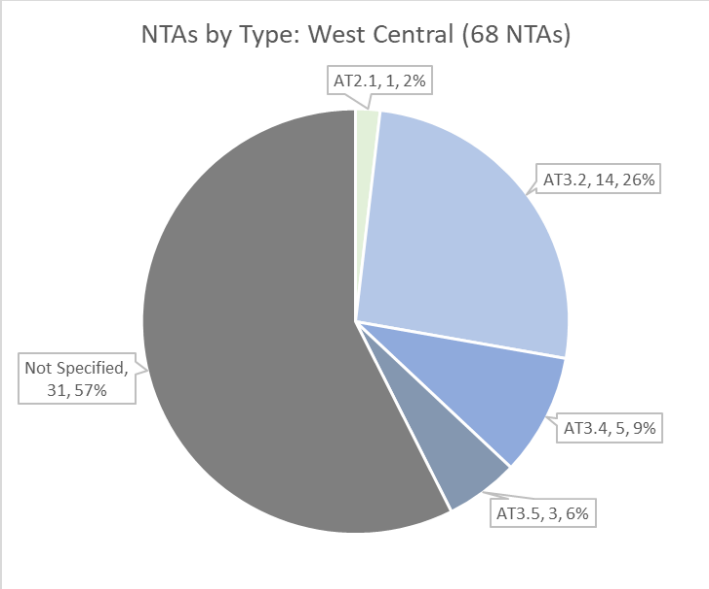


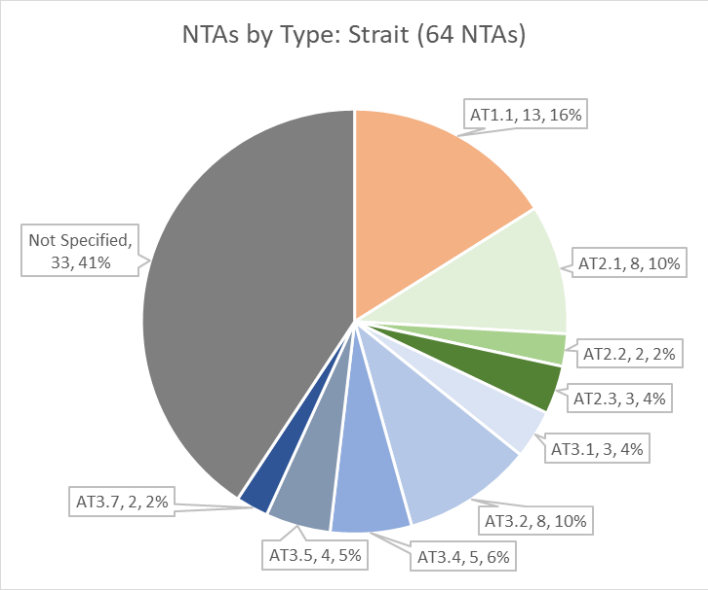
	AT1.1	AT2.1	AT2.2	AT2.3	AT3.1	AT3.2	AT3.3	AT3.4	AT3.5	AT3.7
09.3: Agricultural & Forestry Effluents	1	9	1	2	0	4	0	1	6	0
09.2.1: Oil Spills	0	3	1	0	0	1	0	2	1	1
09.1.1.1: Domestic & Municipal Wastewater to Sewer	1	3	0	0	0	5	0	1	2	2
04.3: Shipping Lanes and Dredged Waterways	1	1	1	0	0	1	2	2	1	2
01.2: Commercial & Industrial Areas (Including Ports)	2	3	1	2	0	18	0	7	2	0
01.1: Housing & Urban Areas	15	9	3	4	3	23	2	10	9	4
09.1.2: Runoff from residential and commercial lands	16	26	5	2	2	28	2	11	9	15

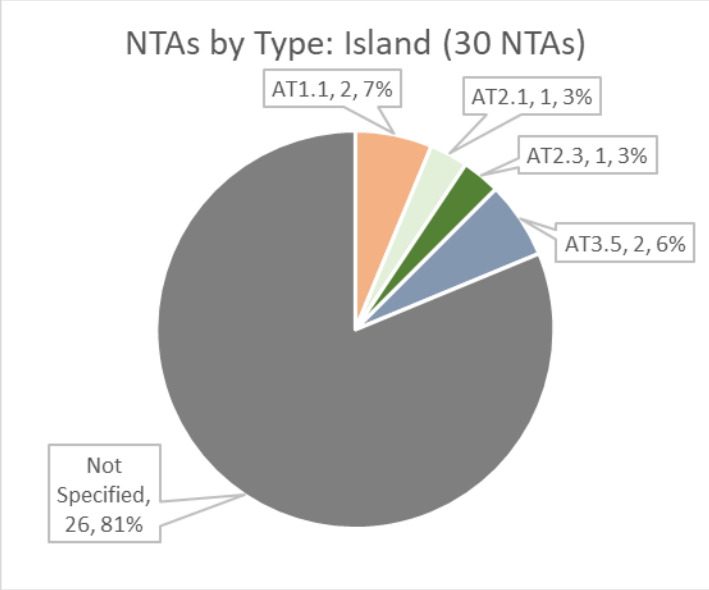
Please Note:
A single NTA may be associated with more than one NTA Type and/or pressure source. For this reason, the totals shown in the graphs on p. 4-6 exceed the number of NTAs.

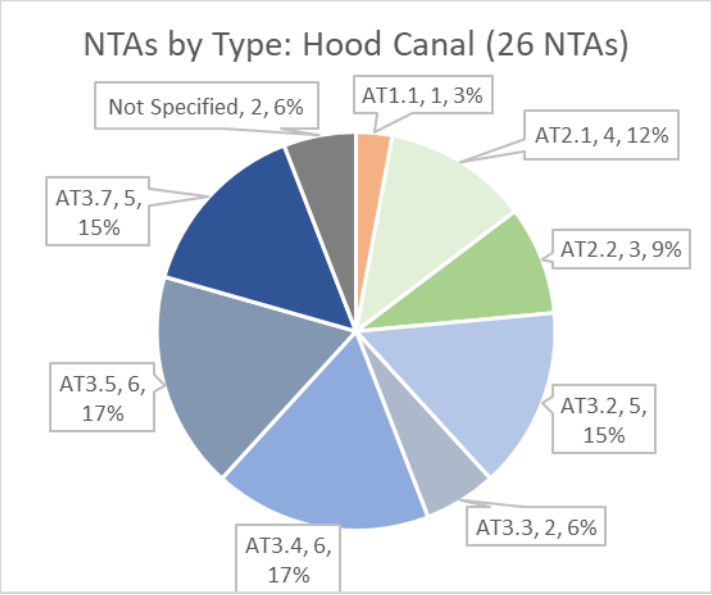
Summary of Strategies and NTAs Supporting Marine Water Quality across LIOs *(continued)*





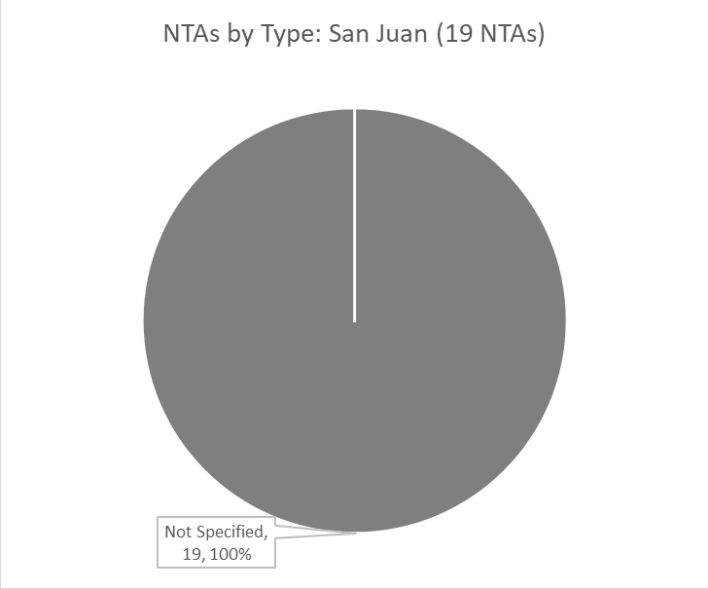


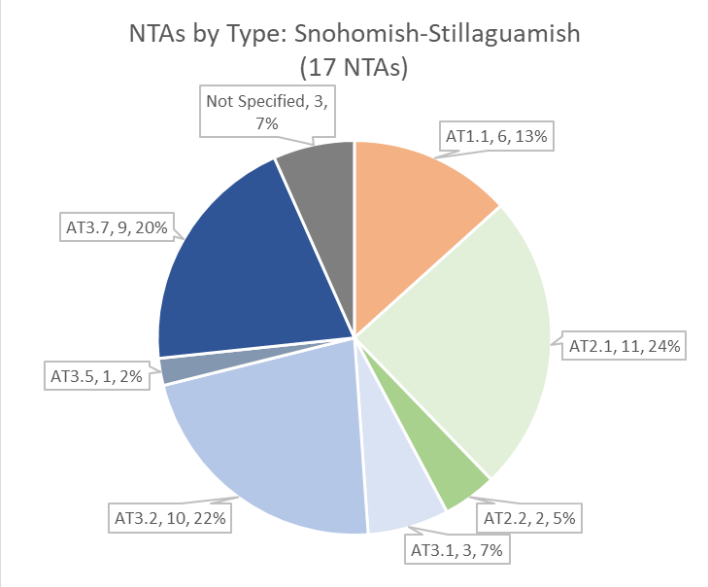


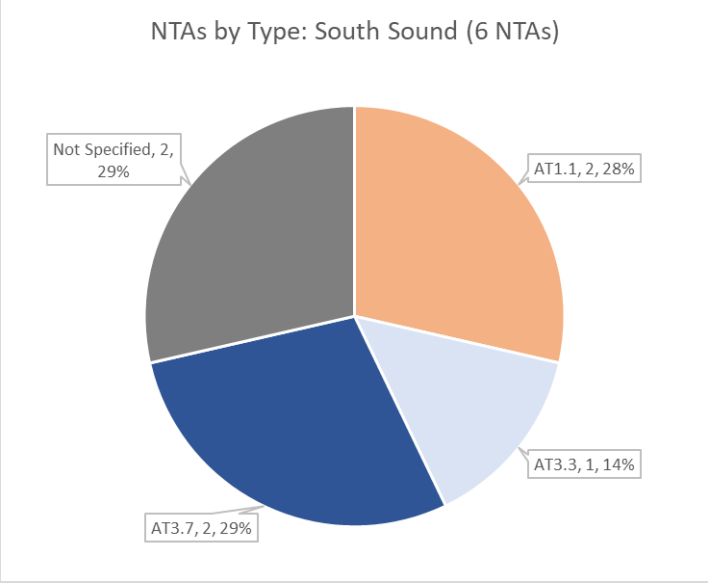


AT1	**Ecological Restoration & Management Actions**
AT1.1	Ecosystem Restoration & Management
AT1.2	Species Management & Recovery
AT2	**Behavioral Change Actions**
AT2.1	Awareness Raising (Education)
AT2.2	Livelihood, Economic & Other Incentives
AT2.3	Law Enforcement & Compliance
AT3	**Enabling Condition Actions**
AT3.1	Ecosystem Protection
AT3.2	Recovery Design & Planning
AT3.3	Law, Policy, Regulations
AT3.4	Research
AT3.5	Monitoring & Evaluation
AT3.6	Formal Education & Technical Capacity Building
AT3.7	Institutional Infrastructure & Development
AT3.8	Recovery Funding
Not Specif	Not specified

Summary of Strategies and NTAs Supporting Marine Water Quality across LIOs *(continued)*







Consider

- What strategies and NTAs are LIOs using to make progress on MWQ in their LIO geography?
- What activities are occurring in LIOs beyond NTAs (e.g., ongoing programs)?
- How does this information compare to the regional information included in the starter package already?
- Which strategies or NTAs do LIOs recommend be included in the base programs analysis or be considered as a regional effort?

Summary of NTAs supporting MWQ

- 337 NTAs have been identified to make progress on MWQ (incl. some 2018 NTAs); data stewardship is needed to categorize about half the NTAs by the type of action they represent.
- NTAs to support enabling conditions are most common both across LIOs and to reduce common pressure sources (see p. 4). Of the enabling conditions, the most actions are recovery design & planning (AT3.2) and Institutional Infrastructure & Development (AT3.7).
- Interestingly, NTAs that could be used to create or enforce MWQ laws and regulations (AT2.3 & AT3.3) were only selected a few times.

[placeholder for condition of NTAs from report card – are they generally on track?]

Notes from LIOs

- [placeholder for observations and guidance from LIOs re: experience of working on MWQ VS locally: what works well, what could be accomplished at local level with a little more support, what is hard to accomplish at local level no matter what]