



**NPS-FM 2014**

**National Objectives Framework 101**

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# Outline

- NOF= National Objectives Framework – how to implement the NPS-FM
- **Key decisions** to be made within framework
- **Sources of information**
- **How existing work fits** into the national framework
- Conceptual – with examples

# NOF in a nutshell

1. What are we managing our water bodies for?  
(our values and our objectives)  

2. What attributes are important for our values/objectives?  

3. What state do the attributes need to be?  

4. What is the current state of these attributes? 

5. How do our desired and current states compare? 

6. What are the threats and risks to attributes/objectives? 

7. How can we manage the attributes and threats/risks? 

8. Can we afford it, will this be effective? 

# Our Values – it's a Pick and Mix

- NOF has 13 National Values, 2 compulsory:
  - Ecosystem Health (river, lake, wetland or aquifer)
  - Human health for recreation (secondary contact)
- Values in TRMP (Sch. 30A & 30B):
  - ~9-27 categories – many similar to the NOF values
  - 6-9 additional values – may not easily fit into NOF
- Others identified by communities (or FLAGs)
- Pick and mix which values are important for each water body
- Example Values: Swimming and Stock Water



# 1. What do we want to manage the Waimea water bodies for? Our Values and Objectives

Eg. Waimea River

Values

Swimming

Stock water

Value C

Value D...

Objectives

Water is suitable for Swimming at all times.

Except in times of drought, water quality provides for stock watering.

Except in times of drought, water quality provides for Value C.

Water quality provides for Value D.

# 2. What attributes are important for our values/objectives?

	Swimming	Stock Water	Value C
Visual Clarity			
E.coli			
Odour			
Attribute 4			
Attribute 5			

# Where do the attributes come from?

- **Historic** – eg ANZECC (Australian & New Zealand Guidelines for Fresh and Marine Water Quality 2000), drinking water standards, MfE guidelines etc
- **TDC State of Environment monitoring** -based on recognised monitoring methods and programmes
- **NPS-FM NOF** – gives some for the compulsory values for rivers and lakes
- **Water users (FLAG)**– what is important for the values identified? (eg. No bacteria for swimming)
- NOF has prescribed a four category **grading system** for attributes

# Attributes Grades

	Swimming	Stock water
Water clarity		
E.coli		
Odour		
Attribute 4		
Attribute 5		

Four Grades A-D

D is below the **national bottom line**

NPS-FM: No water body is to remain a D unless it is a D due to:

a) naturally occurring processes

(eg. Ultra-mafic geology – Ni, Cr)

b) existing infrastructure listed in the NPS-FM

(currently we don't have any of these)

# Attributes and Grades - example from NOF

For the NOF value “**Ecosystem health**” for rivers

Attribute: **Nitrate (toxicity)** (mg NO<sub>3</sub>-N per litre)

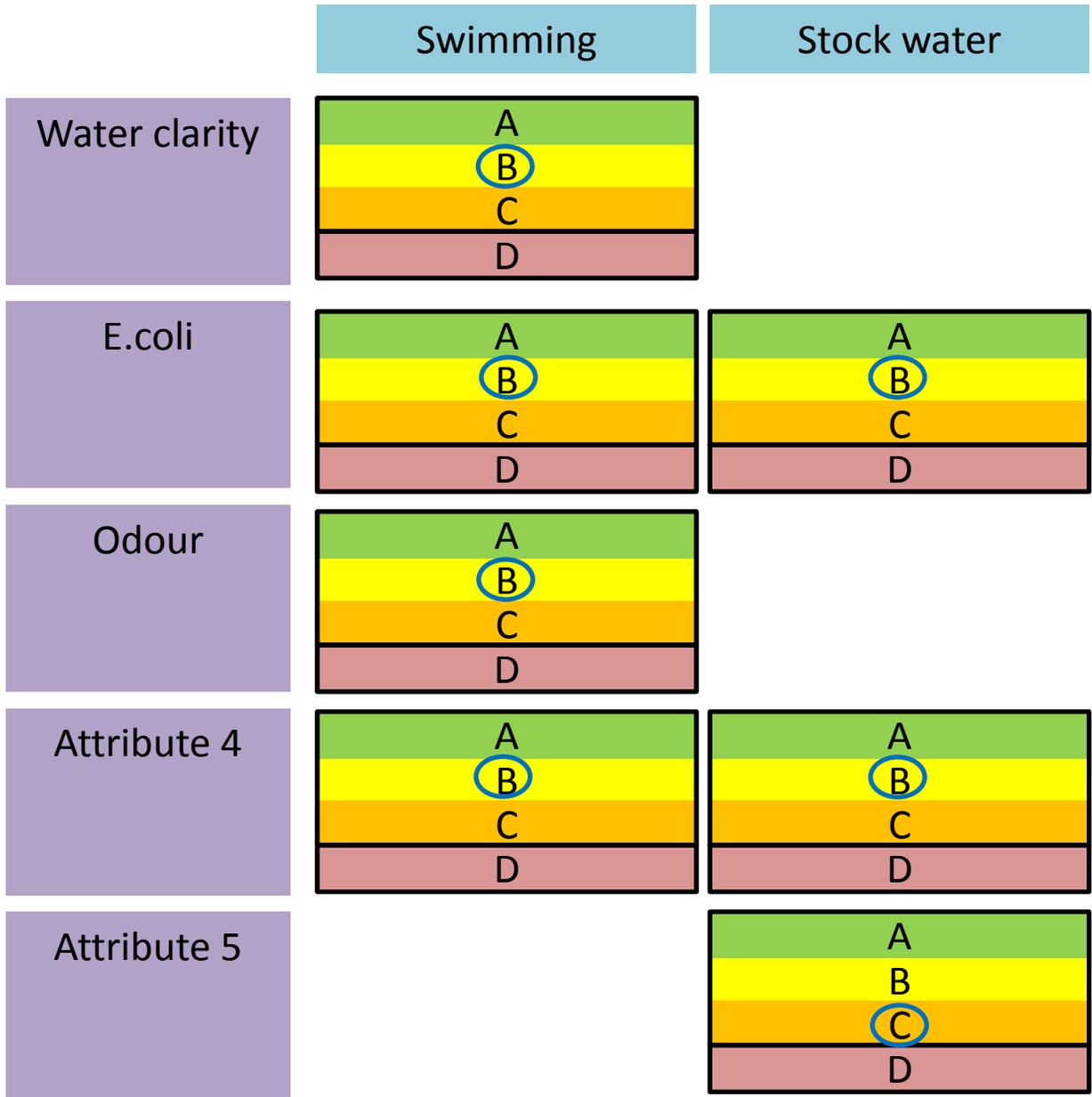
Grade	Annual Median	Annual 95 <sup>th</sup> Percentile	Narrative Attribute State
A	≤ 1.0	≤ 1.5	High conservation value system. Unlikely to be effects even on sensitive species.
B	>1.0 and ≤ 2.4	>1.5 and ≤ 3.5	Some growth effect on up to 5% of species.
C	>2.4 and ≤ 6.9	>3.5 and ≤ 9.8	Growth Effects on up to 20% of species (mainly sensitivity species such as fish). No acute effects.
<i>National bottom line</i> D	>6.9	>9.8	Impacts on growth of multiple species and starts approaching acute impact level (ie risk of death) for sensitive species at higher concentrations (>20mg/L)

The median (middle) of all samples taken in a year are within these values

95% of the time samples are within these values

What the impact will be on the value

### 3. Attributes States needed to meet our Objectives

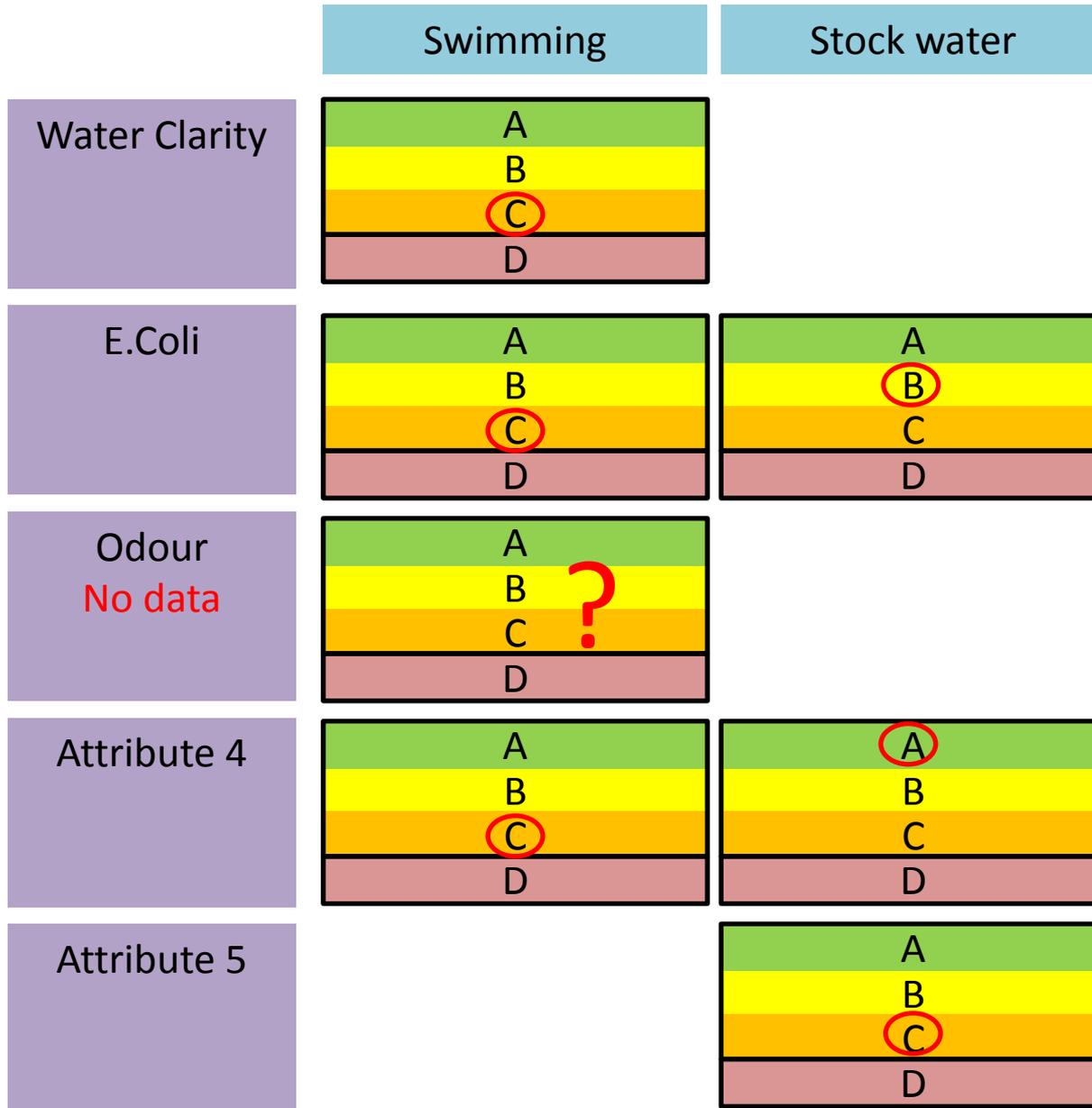


Water is suitable for Swimming at all times.

Except in times of drought, water quality provides for stock watering.

Key  
○ Desired grade  
○ Current grade

# 4. How are things now? Current attribute states

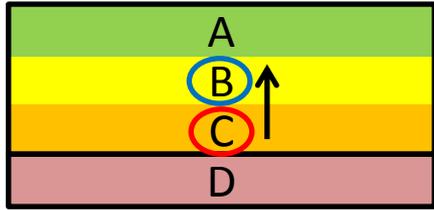


Key  
○ Desired grade  
○ Current grade

# 5. How does were we are compare to where we want to be?

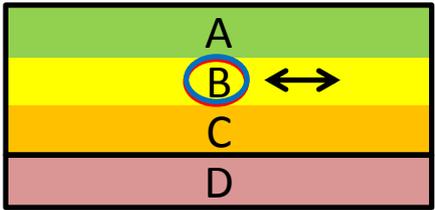
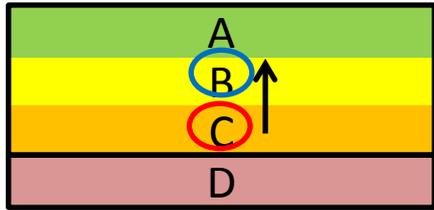
Swimming      Stock water

Water Clarity



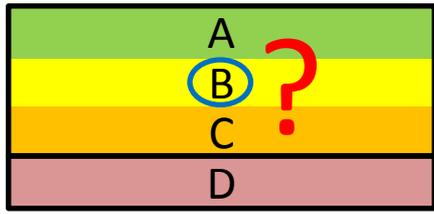
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E.coli

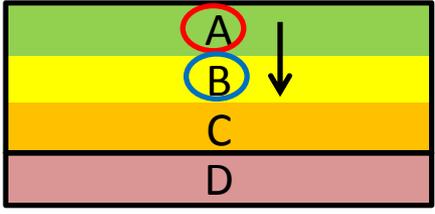
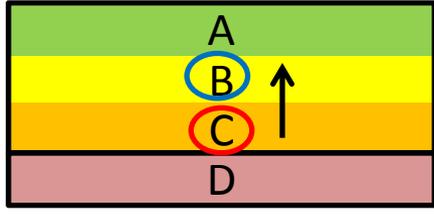


Except in times of drought, water quality provides for stock watering.

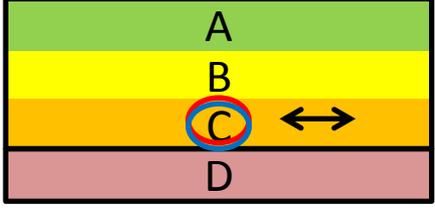
Odour



Attribute 4



Attribute 5



Key  
○ Desired grade  
○ Current grade

## 6. Threats & risks to attributes & objectives

- What is/will affect management objectives?
  - Current land use impacts
  - Land use changes – intensification
  - Uncertainty
  - Population changes
  - Interaction and relationships between different uses/values

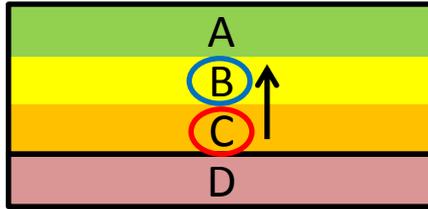
## 6. Threats & risks to attributes & objectives

- Measuring the impacts
  - Modelling current and potential future nutrient loads and effects of land use changes
  - Provide for uncertainties in models
- Have regard to time lags
  - Effects of different riparian land management
  - Aquifer nitrate dynamics
  - Farm/industry systems change processes/transition
- Ability to influence – TDC, other stakeholders
  - Eg. A Value of Blue Duck habitat affected by predator control or public access for recreation

# 7. What do we need to do to achieve the desired attribute grade?

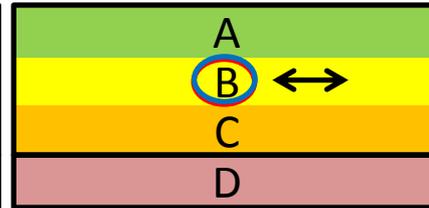
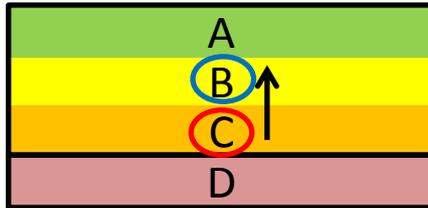
Swimming      Stock water

Water Clarity



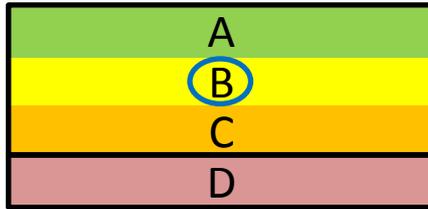
Needs active management to improve for **swimming**

E.coli



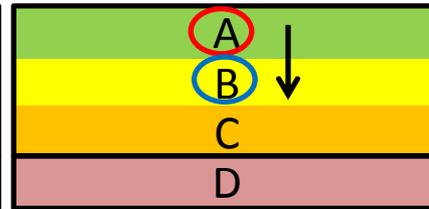
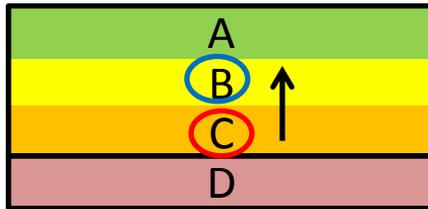
Need active management to improve for **swimming**

Odour



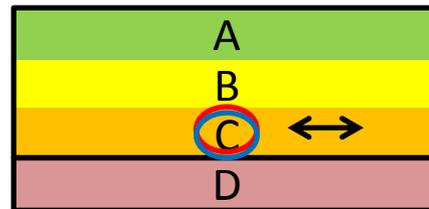
**Need to monitor** what is current state to identify management

Attribute 4



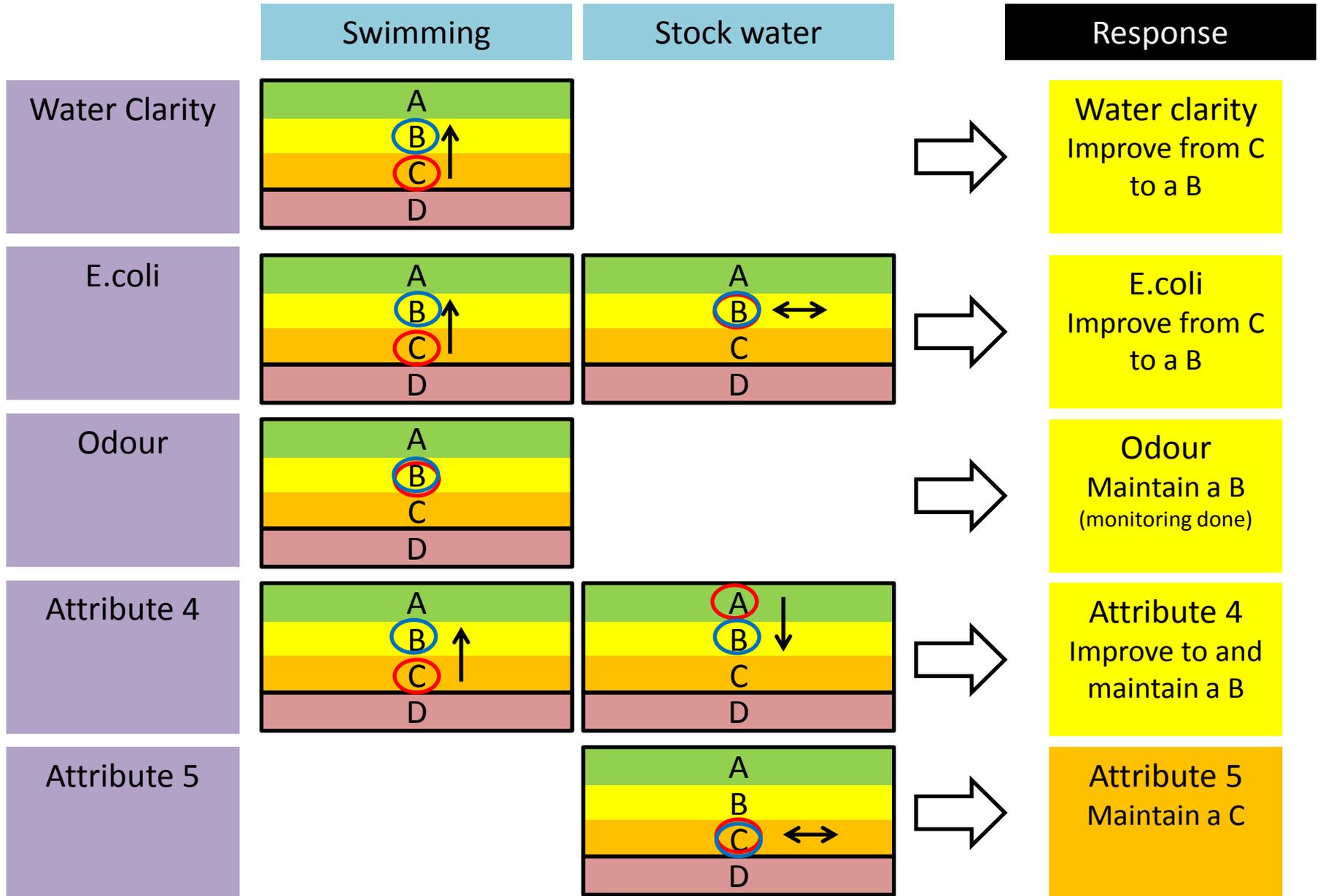
Needs active management to improve for **swimming**

Attribute 5

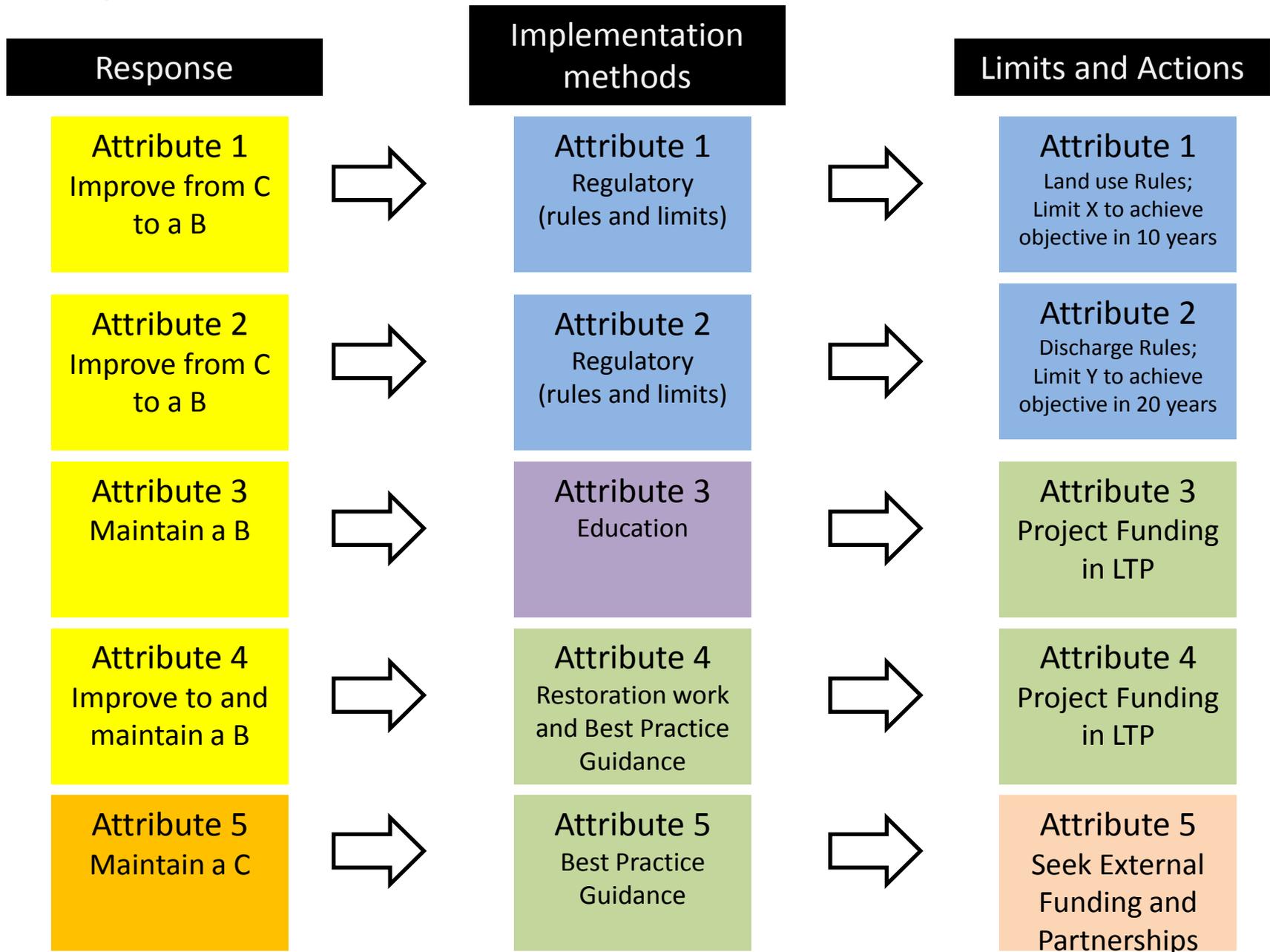


Needs active management to maintain for **stock water**

# 7. Overall Management Responses



# 7. Implementation Methods



## 8. Review affordability & effectiveness

- Opportunity costs / trade-offs
  - Eg. effects on farm profitability
- Implementation costs
  - Eg. expensive technology needed
- Time requirements
  - Eg. results will only be seen in 60 years
- If affordable, effective and acceptable = 😊 yahoo!
- If not = 😞 back to looking at values/objectives

# Where are we at? - Fitting existing work into NOF

Water Quality Values and Attributes Applicable to the Waterbodies of the TEMPLATE Freshwater Management Unit

TEMPLATE	NOF values/attributes *compulsory value	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	Value applicable	
TRMP	Sch.30A&B -rimsplifd	Rivers	Lakes	Rivers	Lakes	Stock and farm water supply	Industrial water	Fuel gathering, Recreational water	Hydroelectric power generation	Irrigation	Fuel gathering, Cultural and agricultural water	Fuel gathering, Cultural and agricultural water	Landscaping water	Cultural and agricultural water	Cultural and agricultural water	Recreation water	Water Supply	Water Supply	Water Supply	Water Supply
TRMP	Sch.36A,B & C Clearer	Rivers	Lakes	Rivers	Lakes	Stock and farm water supply	Industrial water	Fuel gathering, Recreational water	Hydroelectric power generation	Irrigation	Fuel gathering, Cultural and agricultural water	Fuel gathering, Cultural and agricultural water	Landscaping water	Cultural and agricultural water	Cultural and agricultural water	Recreation water	Water Supply	Water Supply	Water Supply	Water Supply
Attributes	Rivers	Lakes	Rivers	Lakes	Stock and farm water supply	Industrial water	Fuel gathering, Recreational water	Hydroelectric power generation	Irrigation	Fuel gathering, Cultural and agricultural water	Fuel gathering, Cultural and agricultural water	Landscaping water	Cultural and agricultural water	Cultural and agricultural water	Recreation water	Water Supply	Water Supply	Water Supply	Water Supply	
Acidity	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Alkalinity	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Ammonia	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat
Bromide	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Calcium	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Chloride	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Dissolved Reactive Phosphorus	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
E. Coli (Escherichia coli)	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat
Faecal Coliforms	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat
Fluoride	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Free Carbon	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Hardness	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Iron	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Magnesium	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Manganese	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Nitrate Nitrogen (NO3-N)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
pH	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Potassium	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Silica	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Sulphate	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Specific conductivity (at 25°C)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Temperature	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Dissolved Oxygen (DO)	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat
Invertebrate community (I-EPT)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Invertebrate community (NOI)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Invertebrate community (Number)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Invertebrate community (Diversity)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Invertebrate community (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Invertebrate community (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phosphate	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat	Y-50E	Y-Spat
Secchi Depth	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Turbidity	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Water Temperature (shallow)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Oxygen Saturation	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Oxygen Saturation (depth)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Dissolved Phosphate	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Dissolved Silica	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Dissolved Zinc	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Dissolved Copper	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na	Y-50E	Na
Phytoplankton (Taxa)	Y-50E	Na	Y-50E	Na																



Questions?