Visual Evidence

Dr Jane Kitson

Te Runanga o Ngai Tahu

Mahinga Kai example

Slide 1; *(source Williams and Crow 2016)*

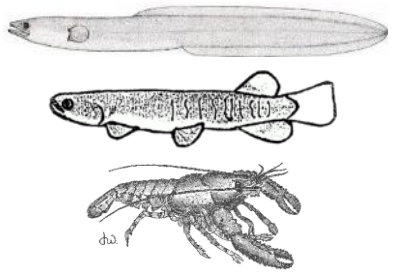
Periphyton
(Relevant for invertebrate habitat/abundance /biomass/community composition)

Water clarity/turbidity/suspended fine sediments
(relates to the amount of light in the water needed for aquatic plants to grow, and how much suspended sediment (soil) is in the water. Too much can affect visual feeding of fish, cause abrasions to fish and clog gills)

Nitrogen and phosphorus
(not too high and not too low for supporting primary production e.g., periphyton/algae)

Flow regime*

Fish habitat
(places for fish to live)



Benthic invertebrate habitat
(places for kai species to live)

Fine deposited sediment
(Can degrade feeding and spawning habitat for fish)

Invertebrate habitat and wetted productive area

Invertebrate abundance/biomass and quality
(species and size composition)

Other kai/food species (Slide 5)

Dissolved Oxygen in the water (DO)

Water temperature

pH (acidity)

Toxicity Chronic and acute
eg nitrate, ammonia, heavy metals etc.

Pathogens, disease

Fish passage

Introduced predators & competitors

Associated species eg kakahi and hosts, and interactions between species & ecosystem

Connections and health of other ecosystems – which support different life stages eg wetlands, estuaries, springs, ponds, rivers, streams, coast, ocean

Attributes for mahinga kai/taonga species

Adapted from Hayes. 13 April 2016

At risk, declining

Threatened, nationally vulnerable

Spends part of life cycle at sea

Freshwater Fish in Southland

Migratory galaxias

The whitebait species

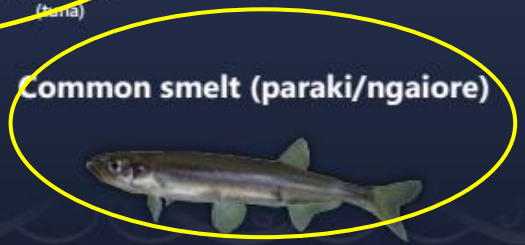
The 'bullies'

Non-migratory galaxias

Eels (tuna) and lamprey (kanakana)

Torrentfish (piripiripohatu)

Common smelt (paraki/ngaiore)



Black flounder

Pressures on our fish

Many pressures affect Southland's freshwater fish. These can include:

- Poor water quality – high levels of sediment and nutrients and reduced clarity can stress fish or be toxic and can reduce spawning success
- Over fishing – which can deplete breeding stock
- Water quantity – low flows and taking too much water can stress or kill fish
- Habitat removal/destruction – reduces the area that fish can live in
- Wetland removal and drainage – reduces the area that fish can live in
- Dams/obstacles, like hanging culverts – prevent fish from migrating, which is an important part of their life cycle

What can you do?

- Improve water quality and stream environments by planting and fencing riparian margins
- Obey fishing laws and only take what you need
- Respect wet areas as important habitat for fish
- Remove obstacles like hanging culverts or dams, or provide fish passage over these barriers

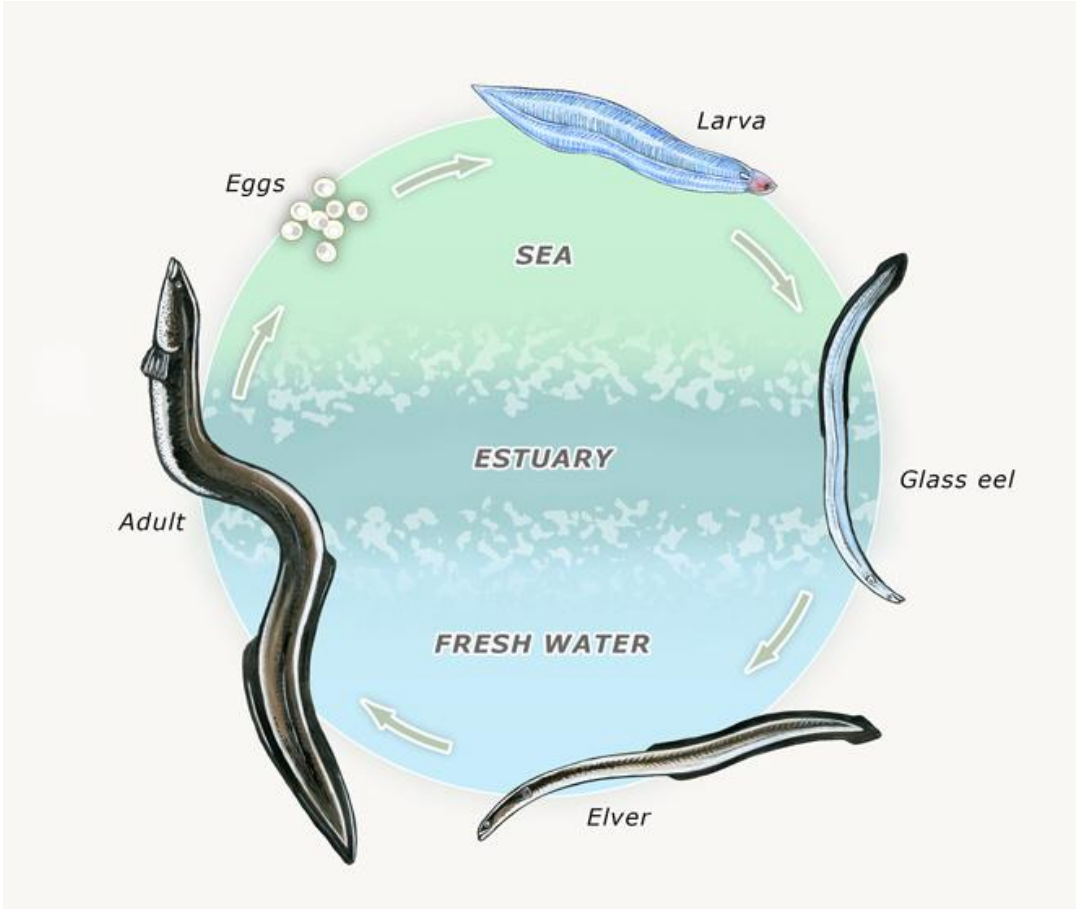
Fish not to scale

TE AO MARAMA INC.

environment SOUTHLAND
Te Taiao Tonga

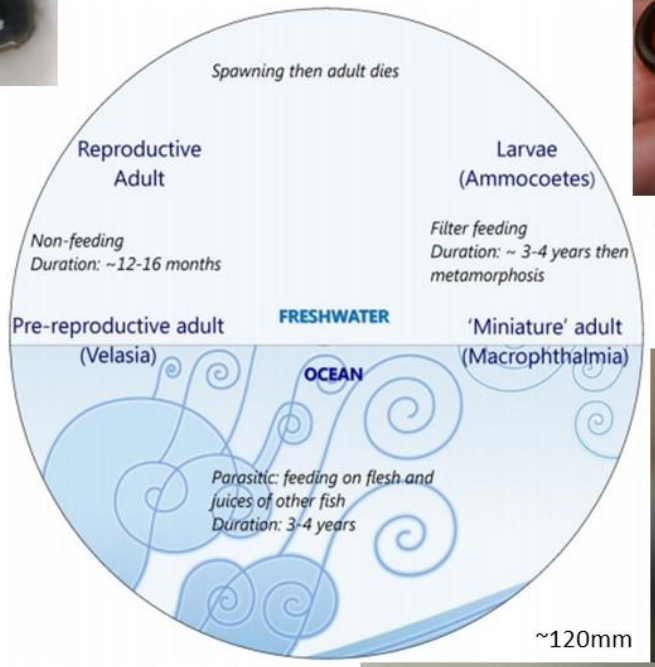
Examples of mahinga kai life cycle

TUNA

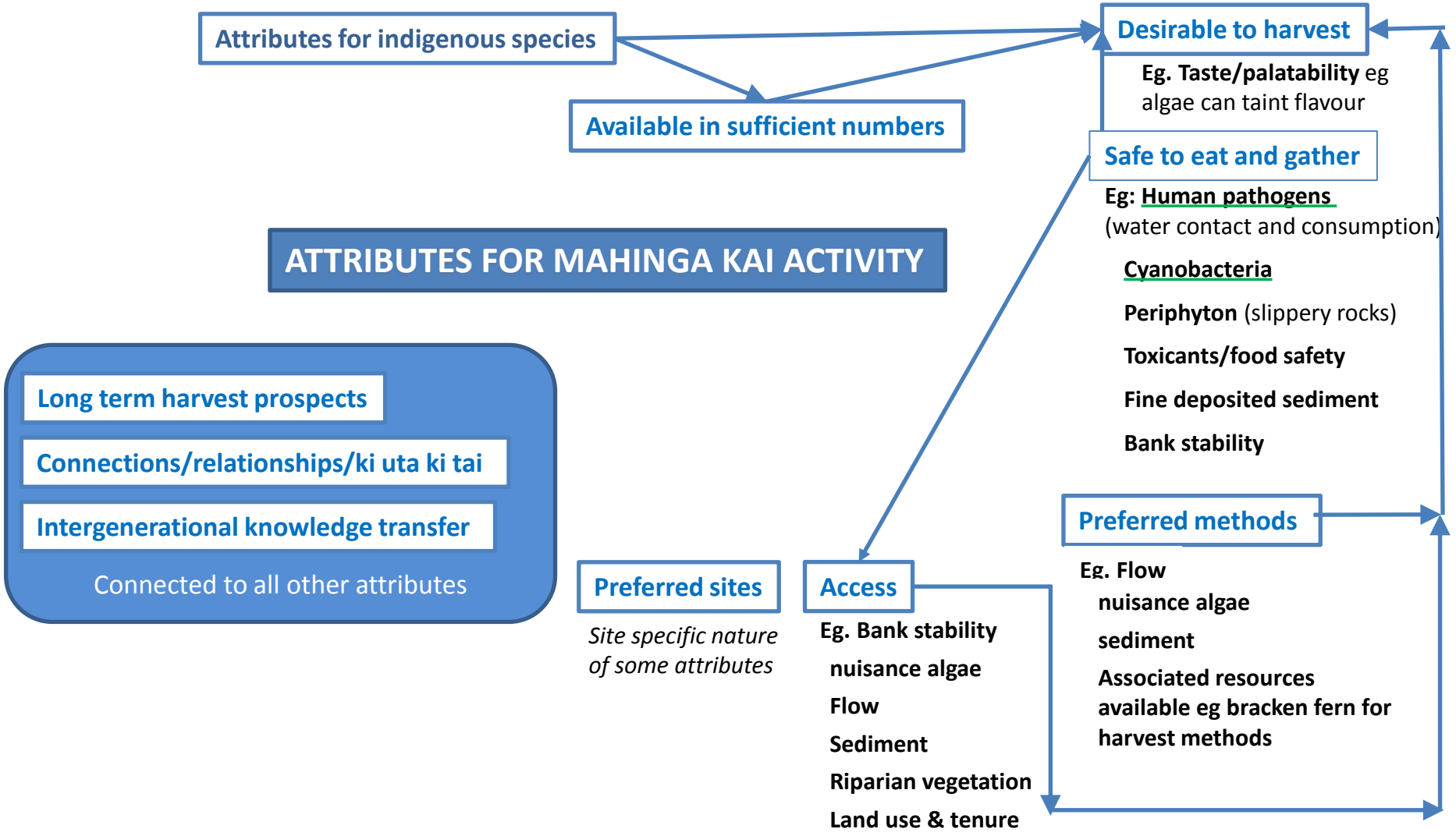


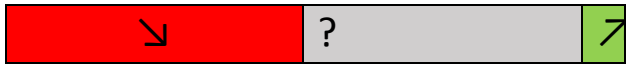
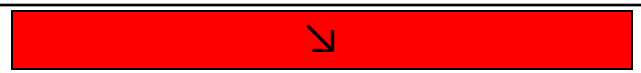
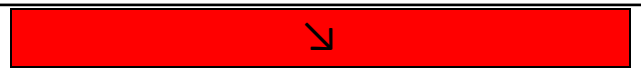
KANAKANA

~450 to 750mm



<80-100mm


Attributes for indigenous species
Available in sufficient numbers
Desirable to harvest
Eg. Taste/palatability eg algae can taint flavour
Safe to eat and gather
Eg: Human pathogens (water contact and consumption)
Cyanobacteria
Periphyton (slippery rocks)
Toxicants/food safety
Fine deposited sediment
Bank stability
ATTRIBUTES FOR MAHINGA KAI ACTIVITY
Long term harvest prospects
Connections/relationships/ki uta ki tai
Intergenerational knowledge transfer
Connected to all other attributes
Preferred methods
Eg. Flow
nuisance algae
sediment
Associated resources available eg bracken fern for harvest methods
Preferred sites
Site specific nature of some attributes
Access
Eg. Bank stability
nuisance algae
Flow
Sediment
Riparian vegetation
Land use & tenure

Attributes	State	Trend (17 years)
Mahinga kai species		
Toxicants - Rivers		
Nitrate		
Ammonia		
Trophic State (Nitrogen and Phosphorus) - Rivers		
Total Nitrogen		
Total Phosphorus		
Dissolved Reactive Phosphorus		
Clarity		
Invertebrates		
Connections and health of other ecosystems – which support different life stages		
Lakes: Te Anau & Manapouri		
Lakes: Coastal		
Wetlands		
Estuaries		
Mahinga kai activity : Safe to harvest		
Human pathogens (*E. coli*)		
Cyanobacteria		

Mō tātou, ā, mō ngā uri, ā muri ake nei

For all of us and our children after us.