

Biota Nodes

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Introduction

Biota; the plant and animal life of a particular region or period. (from Greek biotē way of life, bios life)

Node; a connection point; an intersection point; the small swelling from which one or more leaves emerge; (from Latin nōdus knot)

Te Kōhaka o Tūhaitara Trust

The 200 year vision for Te Kōhaka o Tūhaitara Trust is to restore the 10.5km of Tuhaitara Coastal Park to indigenous coastal species.

To achieve this vision and in order to aid the natural transfer of indigenous biota throughout the park and adjoining Regional Parks, we are creating a network of biota nodes.

These nodes will be a series of small predator fenced areas with freshwater holes, approximately 200-300m apart. They will be planted with native species that attract birds and insects(berry and nectar) and are easily propagated by the transfer of seeds by fauna or wind dispersal.

Once established these nodes will continue to expand until they join and form a biodiversity skeleton or corridor along the length of the park.

The process to establish a biota node is generally the same in any type of environment. This booklet provides a set of lesson plans in order to establish and grow biota nodes.

Whero Biota Node

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| We | lco | me | |

Introductions

- Overview of the Trust and Park including our vision
- Why we are here: biota nodes. Reason for them, importance and long term outcomes.
- Examples of learning sessions: minnow trap, doc 200, telescope/bird id, Visits from ecologist, ornithologist, aquatic scientist.
- Acknowledgement of sponsors/supporters

Notes:

To do before next session:

Name your node



Lesson Number: <u>One</u> Date:

Subject:_____

School

Active learning:

- Native flora
- Water testing
- Animal pest control and weed control
- Planting plan with succession species.

Learning Outcomes:

- Understand the purpose of the Trust and the 200 vision for Tuhaitara Coastal Park
- Comprehend what is a biota node and why are they important in the Coastal Park
- Consider a name for your node

Te Kōhaka o Tūhaitara Trust

Teachers Notes:

Tuhaitara Coastal Park & Te Kohaka o Tuhaitara Trust

The Tūhaitara Coastal Park was established as an outcome of the Ngāi Tahu settlement with the Crown, with the lands being gifted to the people of New Zealand.

The Crown, Ngāi Tahu and Waimakariri District Council determined that the best way to manage the area was by having a local Trust to represent the communities of interest.

The Coastal Park is managed by the Te Kōhaka o Tūhaitara Trust.

Vision

To create a Coastal reserve which is founded on and expresses strong ecological, conservation and cultural values and provides opportunity for compatible recreation and education activities for all people of New Zealand and to uphold the mana of Ngāi Tahu whānui by protecting and enhancing the mahinga kai values of Tūtaepatu Lagoon.

Key Concepts

Biodiversity, Ecosystems and Environmental protection

Specific Learning Outcomes Understand the role of a Biota Node in recreating native coastal

habitat and ecosystems.

Curriculum links Level 1,2,3 Science - *Living World Objectives:* Life processes; Ecology

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|------|-----|-----|
| Lag | oon | L |

Plant communities and Eco restoration

- Native plants in the Park
- Value of wild places of remnant vegetation
- Difficulties of restoration
- Eco sourcing
- Bird propagation, bird attracting species

To do before next session:

List 6 plants that may be suitable

for your biota node

Follow up last session

Name for biota node

Notes

| Lesson N | umber: | IWO |
|-----------|--------|-------------|
| Subject:_ | Plant | communities |

School_____



Date:

Active learning:

- Plant types and communities
- Plant purpose.

Learning Outcomes:

- Understand restoration is complicated, worthwhile and value of the softly, softly approach
- Identify what type of plants are suitable in the Park E.g. eco source and succession
- What are plant communities?
- Give examples of plants that attract birds and can be propagated by bird movement, botanical, common and Maori names and purpose

Te Kōhaka o Tūhaitara Trust

Follow up last session

Tuhaitara Coastal Park & Te Kohaka o Tuhaitara Trust

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| Lesson | plan |
|--------|------|
|--------|------|

| ١ | Lesson Number: <u><i>Three</i></u> |
|---|------------------------------------|
| | Subject: <u>Mudfish</u> |
| I | School |

Date:

MUDFISH

KOWARO

RIPARIAN

WATER

EGGS

OUALITY

SHELTER

TAONGA

S W A M P S

AESTIVATE

BURROWS

NEOCHANNA

BURROWSIUS

FINS

CANTERBURY

Mudfish/ Kōwaro



Visit:

Active learning:

Department of Conservation – Mudfish

Identifying mudfish, the importance of the species and life cycle. Features in your biota node to support a mudfish population.

Learning Outcomes:

Understand how we can support mudfish population in their biota node

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To do before next session:

Complete mudfish word finder puzzle

Te Kōhaka o Tūhaitara Trust Follow up last session What do eco source and succession mean? What are plant communities? List 6 plants that may be suitable for your biota node with botanical, common and Maori names and purpose Plant 1. purpose: Plant 2. purpose: Plant 3. purpose: Plant 4. purpose: Plant 5. purpose: Plant 6. purpose:

Biota Nodes

Developing a plan for our node

- Selecting plant species and where to put them in the node
- Plant spacing and communities

Active learning:

Drawing up the components of the node and completing the plan.

Learning Outcomes:

• Steps involved with planning and designing the node



Date:

Lesson Number: Four

Subject:<u>Biota Nodes</u> - planning



Notes:

To do before next session:

Plant list for node

Follow up last session What are the three key things that can cause a species (animal or plant) to become endangered? 1. 2.

What is it that mudfish can do that most other fish can't?

3

| Lesson Number: <u>Five</u> |
|------------------------------|
| Subject: <u>Animal pests</u> |
| School |

Date:

Animal Pest Control

- Why we need to control pests
- Types of predators, types of control
- Factors to take into account i.e. dogs, horses, people, native sp

Active learning:

- Setting up monitoring tunnels, checking traps, recording, types of traps and considerations for use.
- Types of predators and identification

Learning Outcomes:

• Identify types of animal pests in the park and means of controls important in the Coastal Park.



0 D KRTHHFWA RV R M Q D O V D K H A C T W ОНР GOKFE КАА G UΗ 0 KDMBI R В W 0 NS ΑΤ W S C F С R S Е Х WΖΗ S Η ΝJ BQRF ΗI А S Ζ Ρ R S M S G Ε D Т W Ε S Ε Ρ Ε R O A T S R L S Т Υ ΗE G E H O G E Z E 0 D

STOAT FERRET POSSUM CAT RAT HEDGEHOG MOUSE THISTLE OLDMANSBEARD GORSE BROOM WEASEL

To do before next session:

Wear appropriate clothing for tuna / fish session

| Follow up li | ast session |
|-------------------------|--|
| What Steps a | re involved in planning and designing the no |
| | |
| | |
| | |
| Plant list [:] | |
| | |
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| | |
| | |
| Notes | |
| Notes | |
| Notes | |

| Lesson Number: <u>Six</u> |
|---------------------------|
| Subject: Tuna, eels |
| Cabaal |

Eels/Tuna

- NZ Eels.
- What is the life cycle of eel
- Active learning:
- NZ native eels Anguilla spp.
- View through microscopes: shape, eyes, organs, blood (heart and circulation – see them moving), skin colouration.
- Learning Outcomes:
- Name the species of NZ native eels (common names), stages of growth and where they lay their eggs.



Date:

Notes:

To do before next session:

Prepare for first planting of node. Species around water hole: sedge, reed and harakeke

(NZ flax).



Follow up last session Types of animal pests in the park and means of control

Notes: Eels / Tuna

NZ has two species of native eel: shortfin *Anguilla australis* and longfin *Anguilla dieffenbachii*. Shortfin eels are also found in other countries in the Pacific, but longfin eels are only found in NZ (endemic). Short fin, at approximately 30 years old, and long fin, at approx 70 years old, head out to the warm sea waters near Tonga to breed. They do this once and then die.

Five stages of growth: egg, larvae, glass eel, elver and adult

Larvae look like a leaf with a head and are very small. They migrate to NZ on ocean currents taking two years to complete the journey. Once they near New Zealand (still out to sea) they transform into slender, transparent glass eels. They come into the rivers at the same time as whitebait (grown up whitebait are called inanga, *Galaxias maculatus*). Glass eels stay in the lower reaches of rivers to acclimatise to the freshwater, whilst gradually turning grey/ brown, becoming elvers and then heading up stream to become adults.

Eels eat all kinds of things: when they are small they eat insects and when bigger they eat fish (when really big they'll even eat mice and ducklings!).

Adult teeth are called vomerine and point backwards into their mouth so they can hold on to their prey.

In the small tanks were also some common bullies (*Gobiomorphus cotidianus*). They were small and transparent, and only their eyes and organs were visible.

Additionally there was a torrentfish *Cheimarrichthys fosteri*. There is only one species of torrentfish in NZ and its scientific name literally means torrent fish. They live in the swift riffles of stony rivers and streams.

| | Lesson Number: <u></u> |
|------|------------------------|
| (\ | Subject:_ <i>Birds</i> |
| | School |

Bird species in the park





Date:

- What types of birds in the park
- What type of birds do we want to attract to the park over time.
- What type of plants will we need to attract those birds.

Notes:

Active learning:

- Identify bird species
- Types of plants that attract them.

Learning Outcomes:

- Name current bird species
- Understand how they assist the transfer of native plant species
- What types of birds do we want to establish food sources for

To do before next session:

Where appropriate clothing for bird watching session

Te Kōhaka o Tūhaitara Trust

Follow up last session Tuna, life cycle

| Lesson Number: <u> <i>Eight</i></u> |
|-------------------------------------|
| Subject: <u>Lizards</u> |

Lizards

- What types of lizards are in the park
- Why lizards are important

Active learning:

- Identify lizard species
- How we can support them in our node
- Making lizard motels.

Learning Outcomes:

- Identify lizard species in the park and what they eat
- Understand why are they important
- Create lizard areas

Notes:

To do before next session:

Design and draw a lizard motel



Date:

Lizard motel

School



Follow up last session

Bird species that support the re-vegetation of native plant species at Tuhaitara

| Lesson Number: <u>Nine</u> | Date: |
|---------------------------------|-------|
| Subject: <u>[nvertebrates</u>] | |
| School | |
| | |

Invertebrates

- What are invertebrates?
- Where do they live in the park?
- Why are they important?

Active learning:

- Identify invertebrate species
- How we can support them in our node

Learning Outcomes:

- What are invertebrates
- Identify invertebrate species in the park
- Why are they important
- How can we support invertebrate species.

Notes:

To do before next session:

Te Kōhaka o Tūhaitara Trust Follow up last session Lizard species that support the re-vegetation of native plant species at Tuhaitara

Lizard motel drawing completed

Revision Lesson

| Lesson Number: <u>Ten</u> | Date: |
|---------------------------|-------|
| Subject:_ <i>Revision</i> | |
| School | |



Te Kōhaka o Tūhaitara Trust



Trust vision for Tuhaitara Coastal Park



Biota nodes: what are they, what is the purpose, what is the outcome



Plant communities, types



Animal Pests and control



Fish species in the park



Lizards



Bird species



Invertebrates





Australasian Bittern © John Craig



Bellbird on flowering flax © pse



Black billed gull



Black shag



Black shag



Bittern flight



Black swans



Crested grebe



Fantail



Grey duck

Grey teal

Grey teal in flight

Grey warbler on gorse ${}^{\odot}$ pse

Harrier in flight with hedgehog

Kingfisher - Kotare

Little black shag

Little owl on post

Little shag

Mallard grey duck hybrid

Marsh crake

Paradise duck - male

Marsh crake

Pied oystercatcher

Pied shag

Pied stilt

Scaup - male

Scaup female and ducklings © pse

Shoveler - male

Shoveler - female

Spur winged plover

Waxeye

White faced heron roosting

White heron - Kotuku

Index Lizards

Canterbury gecko © Colin O'Donnell

McCanns skink © Colin O'Donnell

Common skink © Colin O'Donnell

Lizard motel

Common bully against stones © pse

Long -finned eel- Tuna

Lamprey - Piharau

Index Traps and monitoring

Holden trap

Monitoring kit

Live capture comparison

Prints

DoC 200 kill trap

Notes

Notes

