

2009

Internal assessment resource

Subject reference: **Biology 2.2**

Taonga: saving our critically-endangered native species

Supports internal assessment for:

Achievement Standard 90769 v1

Research the interaction between humans and an aspect of biology

Credits: 3

Teacher guidelines

The following guidelines are supplied to enable teachers to carry out valid and consistent assessment using this internal assessment resource. These teacher guidelines do not need to be submitted for moderation.

Context/setting

In this activity students research and write a report on a programme designed to prevent the extinction of an endangered **native species in New Zealand**.

Students have the opportunity to research both the biological methods used to recover endangered populations of native species so that species numbers may increase in the future **and** how the technique meets a human need for such a programme.

Requirements of the standard

Students must cover the *biological concepts and processes* associated with the recovery of an endangered population of native species **AND** how the technique *meets a human need or demand* (EN 3, bullet point 2).

Students must cover the biological concepts and processes associated with the recovery of an endangered population and how the technique meets a human need or demand (EN 3, Use of an applied biology technique)

Expectations for each level			
	Achievement	Achievement with Merit	Achievement with Excellence
	Describe: define, give characteristics of, or an account.	Explain: provide a reason as to how or why something occurs.	Discuss: show understanding by linking several biological ideas. This may involve justifying, relating, evaluating, comparing and contrasting, or analysing.
a)	The biological concepts and processes AND the human need or demand		

Usually a thorough discussion will cover the biological concepts and processes, **and** the human need for a recovery programme.

Students will need to develop appropriate questions. It is important the key questions they develop to focus their research include the following three requirements:

- ◆ The **species and its habitat**
- ◆ The **human activity** that has lead to the need for species' preservation
- ◆ The **biological aspect** of the recovery plan

The students will need to learn the technique of forming relevant and appropriate questions and may need *supervision* during the assessment to assist them in the iterative process of question development.

It is expected that the information processed will come mainly from secondary sources. For the ecosystems focussed on in this assessment, it will also be possible for students to collect primary data from interviews and field studies.

Students are expected to provide data, ideas and information to support the statements they make about biological processes, concepts and techniques. For example, an explanation as to why and how an introduced pest affected the native species chosen is backed up with data about pest population numbers in relation to the native species.

Students are expected to source any data, ideas and information in the body of the text of the report, or in a separate written document, if presented orally or by video. This can be by using references, e.g. (Scott 2006, p50) or with footnotes. A reference bibliography is also expected.

As per EN4, students are required to prepare a presentation that records their research findings about an endangered species' recovery programme. Possible presentation formats are web pages, wikis, blogs, video, seminar, magazine feature article or written report. Students are warned against using methods such as a poster, PowerPoint presentation or newspaper report as they tend to limit a student's ability to reach excellence level as these formats make it hard to produce a 'discussion'. If these formats are used, care must be taken to ensure good students are able to produce a 'discussion' for excellence.

Conditions

Students are encouraged to visit the site of the endangered species' recovery programme in order to understand more fully the habitat and ecosystem in which the species lives, and the impact humans have had on it. Sufficient time will need to be given to ensure students have the opportunity to access a wide range of appropriate resources, process and interpret the information gained and present a report. It is suggested a field trip day be planned for followed by at least four class periods and some homework time over a three-week period, in which students can complete this assessment.

It is expected that students carry out their research and compile their report with teacher *supervision*. Milestones or checkpoints could be established over the duration of the research time, where students conference with their teacher in order to check and clarify ideas. Students must sign an authenticity sheet, in line with the requirements of the school, to state that the finished report is their own work. They must also supply a detailed reference list so that authenticity can be tested.

Resource requirements

- Access to a wide range of resources and sources of information on different species' recovery programmes, particularly the Department of Conservation (DOC) facilitated programmes.
- A planned visit to a species' recovery site and the ecosystem pertinent to that species.

Assessment schedule: 90769 v1– Taonga: saving our critically-endangered native species

This assessment activity involves researching how an applied biology technique is used to meet a human need or demand.

To be awarded the grade (A, M or E) the student must meet the criteria listed in the respective judgement columns below.

Judgement for Achievement	Judgement for Achievement with Merit	Judgement for Achievement with Excellence
<p>Evidence shows that the student is able to process information into their own words in a report containing referenced descriptions of the biological concepts and processes relating to a programme designed to prevent the extinction of endangered native species in New Zealand, and the human need or demand for the conservation/ preservation/ species recovery plan</p> <p>References are required for researched ideas and information (see explanatory note 2). All quotes require reference within the text, and diagrams, graphs and photos with references beside them. Report includes a reference list recorded in a way that the source can be located.</p>	<p>Evidence shows that the student is able to process information into their own words in a report containing referenced explanations of aspects of the biological concepts and processes relating to a programme designed to prevent the extinction of endangered native species in New Zealand and the human need or demand for the conservation/ preservation/ species recovery plan</p> <p>References are required for researched ideas and information (see explanatory note 2). All quotes require reference within the text, and diagrams, graphs and photos with references beside them. Report includes a reference list recorded in a way that the source can be located.</p>	<p>Evidence shows that the student is able to process information into their own words in a report containing referenced discussion of aspects of the biological concepts and processes relating to a programme designed to prevent the extinction of endangered native species in New Zealand and the human need or demand for the conservation/ preservation/ species recovery plan</p> <p>References are required for researched ideas and information (see explanatory note 2). All quotes require reference within the text, and diagrams, graphs and photos with references beside them. Report includes a reference list recorded in a way that the source can be located.</p>
<p>Evidence towards Achievement: example of description</p>	<p>Evidence towards Achievement with Merit: example of explanation</p>	<p>Evidence towards Achievement with Excellence: example of discussion</p>
<p><i>The Kakī, or black stilt, is a native wading bird only found in New Zealand. It is critically endangered with very few birds living in the wild. Māori regard it as a taonga or treasured species.</i></p> <p><i>They have become endangered mainly due to predator species introduced after European settlement as well as habitat change. Kakī were once common around New Zealand but they are now mainly in the braided rivers and wetlands of</i></p>	<p><i>The Kakī, or black stilt (Himantopus novaezelandiae), is a native wading bird only found in New Zealand. It is regarded by Māori as a taonga species – a living treasure.</i></p> <p><i>Once common throughout New Zealand, the kakī is now highly endangered with its habitat restricted to the braided rivers and wetlands of the Mackenzie Basin. Mammalian predators such as feral cats and ferrets combined with habitat loss following European colonisation,</i></p>	<p><i>The Kakī, or black stilt (Himantopus novaezelandiae), is a native wading bird only found in New Zealand. It is regarded by Māori as a taonga species – a living treasure.</i></p> <p><i>Once common throughout New Zealand, the kakī is now restricted to the braided rivers and wetlands of the Mackenzie Basin. Mammalian predators such as feral cats and ferrets combined with habitat loss following European colonisation</i></p>

<p>the Mackenzie basin.</p> <p>People didn't think about the kaki much until they realised in 1987 that the number of birds had shrunk to 23. The local runaka were also keen to see numbers increase as the kakī held a special place in their history.</p> <p>The Department of Conservation has a kakī breeding centre just out of Twizel where they incubate the eggs and raise the chicks for the first few months of their lives (Source: www.doc.govt.nz/about-doc/structure/offices/conservancies/canterbury/twizel). They have developed this technique over time, learning from other endangered bird rearing programmes.</p> <p>Numbers of kakī are increasing and each year adults are released around Lake Tekapo. In 2007 there were 102 adults in the wild.</p> <p>People living in the area are keen to see this iconic species survive. Some farmers have covenanted areas on their farms, like Jim and Anne Murray who "have protected 1,018ha of montane tarn wetland and dryland under a QEII covenant on Glenmore Station" (Source: QEII website: www.qe2.org.nz/Site/Covenants/Stories/kaki_habitat.aspx) to aid the survival of the kakī. and so on.</p> <p>Note: A student at this level has completed some research and has covered both aspects of the task but has provided few explanatory details as to the biological process or the human need for the recovery programme. They have used their own words or clearly referenced quotes.</p>	<p>are probably the main causes of the decline.</p> <p>Adult Kakī are distinctive with their completely black plumage, long red legs and fine black bill. They can move large distances between rivers and wetlands but "(u)nlike other river birds most Kakī are non-migratory and remain in the Basin throughout the year" (Source: www.nzbirds.com/birds/kaki.html)</p> <p>A Kakī breeding programme has been in place since 1981, first by the Wildlife Service and more recently by DOC in Twizel. Numerous techniques have been trialed, with varying success. The Kakī Recovery Plan (2001) set out two overlapping phases of recovery over the following ten years. "The first phase aims to increase kakī numbers in the wild in the short-term, while the second phase aims to identify and overcome the causes of breeding failure and adult mortality in the wild" (Ditto)</p> <p>Scientists from Landcare Research and Canterbury and Otago universities have been working alongside DOC to ensure genetic diversity within the species is maintained. Presently some hybridization is occurring with poaka or pied stilt. Landcare scientists believe that "long term conservation and recovery of New Zealand's indigenous biota depends on our ability to identify genetically 'at risk' species and establish principles by which genetic diversity can be restored and maintained". (2009: Reducing extinction risk by sustaining genetic diversity, www.landcareresearch.co.nz/research/obi.asp?Proj_Collab_ID=24)..... and so on.</p>	<p>are probably the main causes of the decline. In recent years studies have shown that breeding difficulties may well be the result of iodine deficiency.</p> <p>The recovery of the kakī has become a very important focus of numerous scientific studies beyond the work that is undertaken by DOC through the Kakī Recovery Programme in Twizel. Organisations working on scientific research in partnership with DOC include Landcare, the Universities of Otago and Canterbury with support from various NGOs such as The QEII National Trust, Ngāi Tahu and Forest and Bird. This reflects the significance given to this iconic bird not only as a taonga for Maori but also due to the potential for eco-tourism (Source: www.doc.govt.nz/publications/conservation/native-animals/birds/black-stilt-kaki-recovery-plan/14-advocacy-and-research-objectives) It is interesting to hear the viewpoint of a local landowner who is supportive of the programme as it is not core to his business of farming. It was obvious that he has a strong emotional attachment to these birds, probably due to a long association with them over the years he has lived and farmed on the banks of the upper Waitaki River (Personal interview; Jan 2009).</p> <p>The kaki captive breeding programme was established in 1981 and has developed over time as knowledge and understanding of the birds needs has grown. There are numerous difficulties in providing such a programme; one being the need to develop a safe transition for the birds from captivity to the wild. Research has shown that</p>
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	<p>Note: A student at this level uses the information to provide evidence to support an explanatory response. There may be the beginning of extrapolation of ideas and information but may not synthesize information to any depth. They have written concisely in their own words enhanced by clearly referenced quotes.</p>	<p><i>captive birds can be prone to dietary deficiencies. "During the 1997 and 1998 breeding seasons, the survival rate of captive-laid eggs during artificial incubation and hatching was lower than that of eggs laid by wild kakī, which were collected and incubated artificially in the same environment" (Source: Zoo Biol 23:1-13, 2004.). Once iodine supplementation occurred the survival rate increased. Such research is vital for the long-term sustainability of not only the birds but also the breeding programme. DOC has developed a work plan and priority for the Kakī Recovery Programme as seen below ... (Source: www.doc.govt.nz/publications/conservation/native-animals/birds/black-stilt-kaki-recovery-plan/14-advocacy-and-research-objectives)</i></p> <p>Note: A student working at this level has researched widely and has synthesized a great deal of material to build a comprehensive picture of the processes behind the recovery programme. They have drawn on the research work that has informed the recovery programme but also offer a discussion of the pros and cons, possibly even positing new explanations as to why or how the technique meets a deep human need or demand.</p>
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2009 Internal Assessment Resource
Subject Reference: **Biology 2.2**

Cover Sheet

Taonga: saving our critically-endangered native species

Supports internal assessment for: Achievement Standard 90769 v1 Credits: 3

Research the interaction between humans and an aspect of biology

This achievement standard involves researching how an applied biology technique is used to meet a human need or demand.

Achievement	Achievement with Merit	Achievement with Excellence
Research and describe the interaction between humans and an aspect of biology	Research and explain the interaction between humans and an aspect of biology	Research and discuss the interaction between humans and an aspect of biology

Final Grade: *Achievement* *Achievement with Merit* *Achievement with Excellence*

Comment:

Signed (Teacher):

Date:

Signed (student):

Date:

Extract from chapter 9 'The State of our Biodiversity' sets the scene for our study:

"New Zealand has lost a third of its native land and freshwater birds and now has a greater percentage of threatened endemic birds than almost any other country. Two thirds of our land is now a biodiversity desert in which 1,000 known taxa of plants, animals and fungi are struggling to survive. Some may not even reach the next century. The threat is greatest for our endemic vertebrates and for plants, fungi and invertebrates with restricted populations.

The reasons for the continuing pressure on our threatened species are partly perceptual and partly historical. The perceptual problem is shared by most New Zealanders. It rests on the belief that the remaining area of natural habitat, in the mountains and isolated reserves, is sufficient to support our surviving indigenous species, provided it is protected or properly managed. In fact, the remaining area is not sufficient. For many of our threatened species, the existing habitat is in the wrong location or in reserves which are too small.

Faced with these pressures and problems, the future seems bleak for many of our indigenous species unless current rescue and restoration efforts can be expanded. To meet this huge challenge, land uses will need to become more accommodating to native species, effective pest control will need to be maintained over large areas, systematic monitoring of biodiversity will need to be undertaken in all regions and fishery areas. In addition, our recently increased rescue and restoration efforts for vulnerable species and habitats on the protected estate will need to be consistently maintained or increased to ensure success. More effort will also need to go into public awareness and education programmes."

You may read the full document here:

www.mfe.govt.nz/publications/ser/ser1997/html/chapter9.9.html

The report was updated in 2007 and can be found at:

www.mfe.govt.nz/publications/ser/enz07-dec07/html/chapter12-biodiversity/index.html

Many of our native species are protected by New Zealand law; it is against the law to harm or kill an endangered species. Internationally CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) sets controls on the international trade and movement of animals and plant species that have been, or may be, threatened as a result of excessive commercial exploitation.

In this assignment you are to research and report on a species' recovery programme designed to ensure the survival of an endemic species and how the biological technique used meets a human need or demand.

Conditions

<<Teachers will need to insert conditions >>

For example, topic selection and research: Time available is four class periods and homework time over a period of three weeks. Therefore the research is to be completed by (date and time)

Report

This will be written up in class, under exam conditions, in the last two to three periods of the three weeks. Write up will begin on..... (date and time)

A. Topic

Choose an endemic endangered species within a defined ecosystem, e.g. the kakī/ black stilt in the Mackenzie basin.

B. Develop questions

Develop an over-arching question based on what you need to find out about your chosen ecosystem. The question must include the ecosystem, the human activity and the impact of the human activity. For example in the question:

'What has driven humans to decide to preserve the kakī in the Mackenzie basin and what method(s) have been developed to ensure its survival?'

Then develop further questions to tease out the aspects you will need to explore to ensure you cover all requirements of the standard, as below:

- The **species and its habitat** – it is in 'the Mackenzie basin'. What does that include? How will you define the habitat? What is particular about the species?
- The **human activity** that has led to the need for species preservation. What has been the impact on the habitat of the species? Why do humans now want to preserve it?
- The **biological aspect** of the recovery plan. What biological knowledge is required? How have scientists researched the species and what do they understand about it and how has that knowledge led to improvements in the recovery programme?

Before you begin research, check with your teacher to ensure your research questions are suitable.

C. Research

Gather information on the chosen ecosystem and habitat of an endangered species within that ecosystem.

The researched material must provide information on:

1. How the native plant, bird or animal species chosen has become endangered

For example:

- What things have impacted on its habitat?
- What data could be included to show changes in abiotic and biotic factors that affect numbers of individual plant or animal species?
- What data could be included on species' decline over time?

2. The human need or demand for the preservation of the species.

For example:

- Why is the bird, plant, skink or snail important for New Zealand?
- What are/were the reasons for the development of a biological rescue and recovery programme?

3. Important biology involved in this rescue and recovery method or programme.

For example:

- How does the rescue and recovery method enhance the population of the species?
- How was the method researched or developed?
- What are the advantages and disadvantages of the method?

These questions and statements are starting points only, to indicate the kind of evidence you will need to produce a report, in Part D below. You will need to keep a folder of researched material that includes photocopies or originals of written resources and other resources (e.g. pamphlets, notes from a video, photos). All material included must have information that identifies the source. This may include: author, year, title, publisher, place published; or URL and date accessed; or name and contact details of people and organisations' approached. This material is required for your formal report and it is good research practice.

D. Report

Produce a report on your chosen endangered species that **discusses** the biological concepts and processes associated with the recovery of an endangered species/population **and** how the technique meets a human need or demand.

The report must be in **your own words** but you are expected to support your ideas and conclusions with information from different sources. A limited amount of information can be copied directly from a source but it must be in '**quotation marks**'. This information, plus any diagrams included, must be **properly acknowledged** in the body of the report (or if presented via video or in a seminar, verbally acknowledged) with the source and date of publication, e.g. '...discovered in China in 1987 (Smith, 1998, p293)' and information about the source must be included in a **reference bibliography**.

Presentation

Choose a format for your presentation from the list below.

1. Written report
2. Web page, wiki or blog
3. Magazine feature article
4. Seminar (video-taped for moderation purposes)
5. Video

NOTE:

- The report will be assessed on your understanding of the human need or demand and the biological ideas, concepts and processes related to the applied technique (i.e. biological species recovery method) and not on how you have presented it so avoid wasting time on fancy fonts and things that flash or dazzle. It must be easy to read or listen to, and follow your discussion.
- Compiling a Reference Bibliography: It is common practice that all data/quotes/pictures/diagrams/maps, etc. you have used in your work be referenced so that they can be checked and authenticated. Where you have used material that is not your own (i.e. secondary information), those information sources must be acknowledged in the body of the report as well as in a reference list. If you have collected actual primary data it is important that it is acknowledged as follows: date of collection, name and position of the person(s) interviewed.
- Include a reference list of sources used, recorded in a way that the source can be located. In your reference list it is recommended that you use the American Psychological Association (APA) referencing system. Visit APA Online www.apastyle.org/faqs.html for detailed guidance, or the Learning Centre at University of New South Wales www.lc.unsw.edu.au/onlib/ref_apa.html