

Internal Assessment Resource

Education for Sustainability Level 3

This resource supports assessment against Achievement Standard 91735

Standard title: Evaluate measures that may be taken to sustain and/or improve a biophysical environment

**Credits:** 4

Resource title: Kaimoana

**Resource reference:** Education for Sustainability 3.2A v3

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| This resource:   * Clarifies the requirements of the standard * Supports good assessment practice * Should be subjected to the school’s usual assessment quality assurance process * Should be modified to make the context relevant to students in their school environment and ensure that submitted evidence is authentic |

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| Date version published by Ministry of Education | February 2015 Version 3  To support internal assessment from 2015 |
| Authenticity of evidence | Teachers must manage authenticity for any assessment from a public source, because students may have access to the assessment schedule or student exemplar material.  Using this assessment resource without modification may mean that students’ work is not authentic. The teacher may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform. |

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Teacher guidelines

The following guidelines are supplied to enable teachers to carry out valid and consistent assessment using this internal assessment resource.

Teachers need to be very familiar with the outcome being assessed by the achievement standard. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing students against it.

Context/setting

This activity requires students to critically evaluate the effectiveness of the Cape Rodney – Okakari Point Marine Reserve in terms of sustaining or improving the coastal marine environment. Their findings will form the basis of a letter to the Minister for the Environment regarding the effectiveness of marine reserves compared to other measures.

Conditions

It is suggested that this assessment activity take place over an extended period of time, for example 8-10 weeks of in- and out-of-class time.

Resource requirements

Students should have access to:

* Internet, for research and communication.
* Technology and equipment, as and where appropriate.

Additional information

This assessment activity is based on the assumption that students have an in-depth understanding of: the principles and aspects of sustainability; sustainable futures; research methods and data analysis; evaluation; and wherever possible Māori concepts and values relating to the environment as well as a familiarity with Article 2 of the Treaty of Waitangi.

The activity used to assess against this standard, with the choice of a suitable context, could be used in conjunction with assessment activities for EfS 3.1 (AS90828) and 3.5 (AS90832).

Other possible contexts

Although this resource is focused on the coastal marine environment at Cape Rodney – Okakari Point Marine Reserve, you may adapt it to other marine reserves or measures more relevant locally, or to other biophysical environments such as harbours, bush, farm, freshwater or urban environments. If you change the context for the activity, you need to provide equivalent relevant resources.

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Student instructions

Introduction

This assessment activity requires you to evaluate the effectiveness of different measures taken to sustain or improve a coastal marine environment.

You are going to be assessed on how well you critically evaluate measures to sustain and improve a coastal marine environment.

The following instructions provide you with a way to structure your work to demonstrate what you have learnt to allow you to achieve success in this standard.

Teacher note: You will need to read these student instructions and modify them if necessary to meet the needs and interests of your students.

Task

Present the findings from your evaluation as a report to the Minister for the Environment regarding the effectiveness of marine reserves compared to other measures, including the Cape Rodney – Okakari Point Marine Reserve near Leigh as an example.

You may work individually or in a group, but you will be assessed individually. Include evidence of your individual contributions in your logbook if working in a group.

You have 8 weeks to complete this task.

Gather information

* Carry out research and a practical investigation about the coastal marine biophysical environment at Cape Rodney – Okakari Point Marine Reserve.
* Visit the reserve.
* Collect and analyse data and evidence about the ecosystems in the reserve. You will need to name key species, describe their inter-relationships, and describe relevant physical systems that determine the habitats.
* Make sure the data collection and measurement methods are suitable and appropriate. These could include transects, quadrats, fish counts, mapping. You may need to include maps, showing the location of data collection points.
* Research the marine reserve at Cape Rodney – Okakari Point. This may include finding out:
* how people value and use the coastal marine environment and its resources such as kaimoana
* why the marine reserve was created
* changes to the ecosystems since the marine reserve was first created.
* Research what other social, cultural, economic and/or technological measures are commonly undertaken in New Zealand in order to protect fish and other kaimoana stocks, and the coastal marine environment in general.

Write your letter

Organise your findings.

Your letter will include:

* Analysis of:
* the characteristics of the biophysical (coastal marine) environment at Cape Rodney – Okakari Point
* the nature of the relationship between humans and the coastal marine environment and the interactions between them, in relation to aspects of sustainability. Interrelationships may be those that promote or disrupt the sustainability of the environment
* the potential of marine reserves to sustain the coastal marine environment, both now and in the future, using the Cape Rodney – Okakari Point as an example
* the potential of other measures such as rahui to sustain the coastal marine environment, both now and in the future.
* Your informed conclusions about which measures may be most effective in terms of sustaining and/or improving the coastal marine environment.
* Your insightful conclusions about the effectiveness of the measures with reference to the aspects of sustainability. These conclusions may include:
* projecting future impacts and discussing wider implications
* using criteria related to the aspects of sustainability to help you evaluate the measures
* making recommendations.

Submit for assessment

Submit your completed letter for assessment together with your logbook if you were working in a group.

Resources

Useful websites include:

<http://www.doc.govt.nz/parks-and-recreation/places-to-visit/auckland/north-auckland/cape-rodney-okakari-point-marine-reserve-goat-island/>

<http://www.discovergoatisland.co.nz/reserve.html>

<http://www.aucklandcouncil.govt.nz/en/search/pages/search.aspx?k=Goat%20Island%20marine%20reserve>

<http://www.doc.govt.nz/conservation/marine-and-coastal/>

<http://www.forestandbird.org.nz/saving-our-environment/marine-and-coastal>

[http://www.forestandbird.org.nz/campaigns/we-love-marine-reserves/](http://www.forestandbird.org.nz/campaigns/we-love-marine-reserves/marine-reserves-faq)

<http://www.biodiversity.govt.nz/seas/index.html>

<http://www.biodiversity.govt.nz/picture/biodiversity/what/coastal.html>

[http://www.niwa.co.nz](http://www.niwa.co.nz/). Search for marine reserves within this site for research articles related to specific marine reserves.

<http://www.mfe.govt.nz/publications/oceans/>. Search within this site for research articles related to specific decisions, publications, including guidelines developed with Māori regarding kaimoana.

<http://www.marinenz.org.nz/documents/Rahui%203.pdf>

<http://thekaikouraguide.com/rahui/>

<http://www.fishforever.org.nz/why-where-how/marine-protection-tools/rahui.html>

<http://www.fishforever.org.nz/images/ff/latest-news/Mimiwhangata.pdf>.

Assessment schedule: Education for Sustainability 91735 - Kaimoana

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| Evaluate measures that may be taken to sustain and/or improve a biophysical environment.  The student has:   * Carried out research and a practical inquiry to: * analyse the characteristics of the biophysical (coastal marine) environment near Leigh.   *“The reserve is located at Cape Rodney (Okakari Point) which sticks out from the mainland near Leigh. There is a small island off the coast, but very close, called Goat Island. The Māori name of the island is Motu Hāwere.*  *The geology of the area provides a range of habitats for the marine organisms living in the reserve. There are beaches of sand, shells and pebbles, as well as large rocks. Some of the rocks are jagged, and some are smoother mudstone. There are 3 main types of rock, creating 5 distinct ecosystems. There are many different species of fish, seaweed and shellfish in these ecosystems The reserve has become an important breeding ground and nursery for many of these species. The animal species include snapper, leather jackets, butterfish, crayfish, sea anemones, tubeworms, parore, crabs, starfish, kina (reference data).There are several different types of seaweed. Some of the fish feed on the seaweed, some on the shellfish and other invertebrates and some feed on other small fish. There are larger numbers of all species inside the reserve than on other neighbouring parts of the coast, becoming less the further you go away (reference data). Some of these species eg. snapper and crayfish are the targets of people as a source of kai.”*   * analyse the nature of the relationship between humans and the coastal marine environment in relation to aspects of sustainability.   *“The Cape Rodney – Okakari Point Marine Reserve was the first marine reserve established in New Zealand. A marine laboratory had been there at Goat Island since 1964 and in 1975 the marine reserve was established to help scientists study the marine life, but also because the species that used to be there in big numbers weren’t anymore. So human activity over the years had had a negative impact on the environmental sustainability of the area.*  *For many people recreational fishing in the Leigh area is an important pursuit. Reduction in numbers of fish available hadn’t just reduced the sustainability of the environment, but there was also a negative social and cultural impact. The area couldn’t sustain the continuing collection of kaimoana such as fish and shellfish. Local Māori had always collected kaimoana at the reserve and are the kaitiaki for the area. They agreed with the creation of the reserve as the creation of the Cape Rodney – Okakari Point Marine Reserve was designed to protect kaimoana stocks.”*   * Analysed the potential of marine reserves to sustain the coastal marine environment, both now and in the future, using the Cape Rodney – Okakari Point as an example.   *“The marine reserve controls fishing in the area: the reserve is fishing-free and provides fish and shellfish with a sanctuary, which will allow numbers to build up and ensure there will be plenty for future generations. A number of fishers spoken to enjoy fishing just outside the reserve, as the numbers of fish, crayfish etc. are higher there than along the rest of the coast. Some people we spoke to also said there were more fish there now than even before the reserve was established over 30 years ago. If this increase continues, we should be able to sustain recreational fishing for now and in the future. Customary practices regarding the collection of kaimoana are already able to be carried out.”*   * Analysed the potential of other possible measures such as rahui to sustain the coastal marine environment, both now and in the future.   *“In other places in New Zealand the types of measures taken to protect kaimoana and the environment include rahui, marine parks, marine sanctuaries, mataitai and taiapure. Rahui is one of the most common. A rahui is like a temporary tapu, or restriction on the collection of kaimoana or fishing. Most rahui can only be set in place for two years at the most. There are many reasons why a rahui might be placed on an area, and one is to protect the stocks of kaimoana and allow them to regenerate. This reason is a good example of the cultural aspect of sustainability. Rahui can only be placed by the Māori who have kaitiaki status over the area, when they consider it is necessary for the protection of fish stocks. Rahui are well respected, and uphold Māori cultural values, (examples from research quoted) as well as contributing to the environmental aspect of sustainability by protecting the environment.”*   * Drawn conclusions about which measure(s) may be most effective in terms of sustaining and/or improving the coastal marine environment.   *“Rahui are only temporary and this is a disadvantage. A marine reserve that is able to remain for a long time will obviously give the marine life a permanent location for breeding and as a nursery for marine life both inside the reserve and outside. This is obvious at Cape Rodney – Okakari Point Marine Reserve where it has been in place over 30 years. Another advantage of a marine reserve over rahui is that it can be legally enforced. A rahui relies on people having respect for it in order to be successful. Rahui acknowledge tangata whenua as decision makers and kaitiaki, which sometimes marine reserves don’t do. The Cape Rodney – Okakari Point Marine Reserve though, is well supported by local iwi, so perhaps this is partly why it is so successful.*  *In line with current DOC policies, I would like to suggest that you continue to support more marine reserves in New Zealand, as they are the best form of coastal marine protection we have at present.”*  In addition to the completed letter, the student has submitted a logbook containing evidence of their individual contributions.  *The examples above are indicative samples only.* | Evaluate, in depth, measures that may be taken to sustain and/or improve a biophysical environment.  The student has:   * Carried out research and a practical inquiry to: * analyse the characteristics of the biophysical (coastal marine) environment near Leigh.   *“The reserve is located at Cape Rodney (Okakari Point) which sticks out from the mainland near Leigh. There is a small island off the coast, but very close, called Goat Island. The Māori name of the island is Motu Hāwere.*  *The geology of the area provides a range of habitats for the marine organisms living in the reserve. There are beaches of sand, shells and pebbles, as well as large rocks. Some of the rocks are jagged, and some are smoother mudstone. There are 3 main types of rock, creating 5 distinct ecosystems. There are many different species of fish, seaweed and shellfish in these ecosystems The reserve has become an important breeding ground and nursery for many of these species. The animal species include snapper, leather jackets, butterfish, crayfish, sea anemones, tubeworms, parore, crabs, starfish, kina (reference data).There are several different types of seaweed. Some of the fish feed on the seaweed, some on the shellfish and other invertebrates and some feed on other small fish. There are larger numbers of all species inside the reserve than on other neighbouring parts of the coast, becoming less the further you go away (reference data). Some of these species eg. snapper and crayfish are the targets of people as a source of kai.”*   * analyse the nature of the relationship between humans and the coastal marine environment in relation to aspects of sustainability.   *“The Cape Rodney – Okakari Point Marine Reserve was the first marine reserve established in New Zealand. A marine laboratory had been there at Goat Island since 1964 and in 1975 the marine reserve was established to help scientists study the marine life, but also because the species that used to be there in big numbers weren’t anymore. So human activity over the years had had a negative impact on the environmental sustainability of the area.*  *For many people recreational fishing in the Leigh area is an important pursuit. Reduction in numbers of fish available hadn’t just reduced the sustainability of the environment, but there was also a negative social and cultural impact. The area couldn’t sustain the continuing collection of kaimoana such as fish and shellfish. Local Māori had always collected kaimoana at the reserve and are the kaitiaki for the area. They agreed with the creation of the reserve as the creation of the Cape Rodney – Okakari Point Marine Reserve was designed to protect kaimoana stocks.”*   * Analysed the potential of marine reserves to sustain the coastal marine environment, both now and in the future, using the Cape Rodney – Okakari Point as an example.   *“The marine reserve controls fishing in the area: the reserve is fishing-free and provides fish and shellfish with a sanctuary, which will allow numbers to build up and ensure there will be plenty for future generations. A number of fishers spoken to enjoy fishing just outside the reserve, as the numbers of fish, crayfish etc. are higher there than along the rest of the coast. Some people we spoke to also said there were more fish there now than even before the reserve was established over 30 years ago. If this increase continues, we should be able to sustain recreational fishing for now and in the future. Customary practices regarding the collection of kaimoana are already able to be carried out.”*   * Analysed the potential of other possible measures such as rahui to sustain the coastal marine environment, both now and in the future.   *“In other places in New Zealand the types of measures taken to protect kaimoana and the environment include rahui, marine parks, marine sanctuaries, mataitai and taiapure. Rahui is one of the most common. A rahui is like a temporary tapu, or restriction on the collection of kaimoana or fishing. Most rahui can only be set in place for two years at the most. There are many reasons why a rahui might be placed on an area, and one is to protect the stocks of kaimoana and allow them to regenerate. This reason is a good example of the cultural aspect of sustainability. Rahui can only be placed by the Māori who have kaitiaki status over the area, when they consider it is necessary for the protection of fish stocks. Rahui are well respected, and uphold Māori cultural values, (examples from research quoted) as well as contributing to the environmental aspect of sustainability by protecting the environment.”*   * Drawn informed conclusions about which measure(s) may be most effective in terms of sustaining and/or improving the coastal marine environment.   *“Rahui are only temporary and this is a disadvantage. A marine reserve that is able to remain for a long time will obviously give the marine life a permanent location for breeding and as a nursery for marine life both inside the reserve and outside. This is obvious at Cape Rodney – Okakari Point Marine Reserve where it has been in place over 30 years. An advantage of a marine reserve over rahui is that it can be legally enforced. A rahui relies on people having respect for it in order to be successful. The Cape Rodney – Okakari Point Marine Reserve though, is well supported by local iwi, so perhaps this is partly why it is so successful. I believe that marine reserves are by far the best sort of protection method for a sustainable future of our kaimoana. My research shows (data referenced) that although all the methods are effective in some ways…. (relevant examples given) the permanent and total protection marine reserves offer have more positive implications for the organisms within the reserve, and for sustainability altogether. Temporary or partial protection methods only offer temporary or partial protection. Therefore I believe that if New Zealand had more marine reserves, there would be a more positive and sustainable future for our marine life. This would benefit the organisms themselves and the future of the species that rely on the coastal marine life. It would also mean that there was always enough kaimoana found around the marine reserve. This is because the reserves act as breeding grounds and nurseries for species outside the reserve itself, and (data referenced) shows that the marine life has improved outside the reserve as well as in. In line with current DOC policies, I would like to suggest that you continue to support more marine reserves in New Zealand, as they are the best form of coastal marine protection we have at present.”*  In addition to the completed letter, the student has submitted a logbook containing evidence of their individual contributions.  *The examples above are indicative samples only.* | Critically evaluate measures that may be taken to sustain and/or improve a biophysical environment.  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Another advantage of a marine reserve over rahui is that it can be legally enforced. A rahui relies on people having respect for it in order to be successful. However, culturally, a rahui is a good option, because it acknowledges tangata whenua as decision makers and kaitiaki, which sometimes marine reserves don’t do. The Cape Rodney – Okakari Point Marine Reserve though, is well supported by local iwi, so perhaps this is partly why it is so successful. I believe that marine reserves are by far the best sort of protection method for a sustainable future of our kaimoana. My research shows (data referenced) that although all the methods are effective in some ways…. (relevant examples given) the permanent and total protection marine reserves offer have more positive implications for the organisms within the reserve, and for sustainability altogether. Temporary or partial protection methods only offer temporary or partial protection. Therefore I believe that if New Zealand had more marine reserves, there would be a more positive and sustainable future for our marine life. This would benefit the organisms themselves and the future of the species that rely on the coastal marine life. It would also mean that there was always a sustainable supply of kaimoana found around the marine reserve. This is because the reserves act as breeding grounds and nurseries for species outside the reserve itself, and (data referenced) shows that the marine life has improved outside the reserve as well as in. In line with current DOC policies, I would like to suggest that you continue to support more marine reserves in New Zealand, as they are the best form of coastal marine protection we have at present.”*  In addition to the completed letter, the student has submitted a logbook containing evidence of their individual contributions.  *The examples above are indicative samples only.* |

Final grades will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.