

Feeding fish in marine reserves

Cross-curricular approach to a Marine Reserve issue

Feeding fish in a marine reserve constitutes a disturbance of the marine life and is therefore an offence under the Marine Reserves Act. It is an issue some members of the public find difficult to understand. Some think, for example, that feeding fish can only be good for them and must therefore be an acceptable activity in a marine reserve, perhaps even one that should be encouraged.

A set of 13 classroom exercises are detailed below to demonstrate how a single issue can be developed to contribute to mainly biological science and sociology teaching but with opportunities for some useful mathematics, art and writing.

Classroom exercises

Why do people feed fish?

Fish feeding, the law ... and being bitten

- Arguments for creating protected coastal areas (marine reserves)
- Why is the Marine Reserves Act so important?
- Importance of marine reserves
- Changing fish behaviour
- Fish bite swimmers
- Polluting the reserve with food scraps
- Stuffing fish with the wrong food

First thoughts about fish feeding

- Issues and attitudes presented through role play

Familiarity with relevant sections of the Marine Reserves Act

Extracts from the Marine Reserves Act

Experiment: Polluting the shallows with waste food

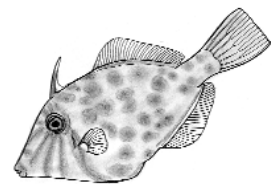
What do fish really eat?

Getting the message across – making a poster

A page from a fish's diary

'Don't Feed the Fish' – designing a public notice board

A tonne of bread and peas

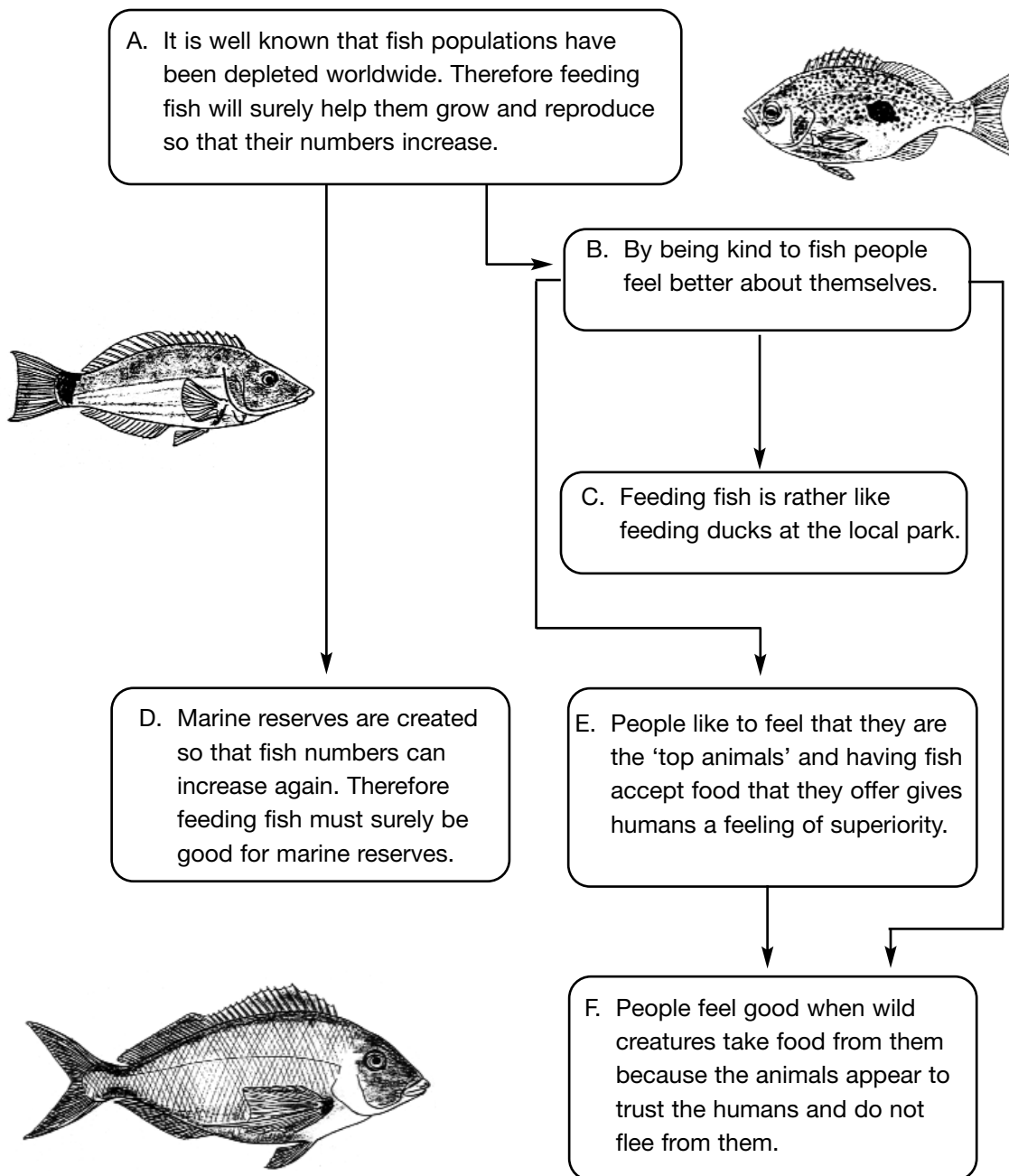


Sociology

Why do people feed fish?

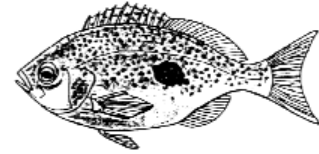
The following thoughts and opinions can be cross-linked to produce a set of starting points from which a class (or the public) might make decisions about feeding fish.

(The following chains of thoughts and opinions represent those held by many people but are NOT necessarily correct or soundly based. They serve only as a starting point for this sensitive topic.)



G. People think that unless fish are fed they will not come close enough to be seen clearly.

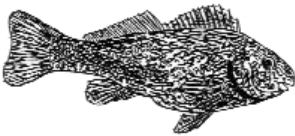
This is not so in a reserve.



H. People get so much satisfaction from feeding:

- ducks in the park
- pigeons in London's Trafalgar Square
- garden birds from special feeders
- fish in a marine reserve

that they are prepared to spend money buying food for these wild animals that are quite capable of finding enough food for themselves.



I. The food that they buy is usually food that they like themselves, not food the animals eat naturally:

- park ducks are fed bread
- garden birds are fed peanuts and bread
- marine reserve fish are fed frozen peas, bread and processed meat (often dog sausage)

None of these are natural foods for the wild animals.

J. People seldom stop to consider if the food they are giving is:

- a. natural
- b. good for the animals
- c. harmful to the animals

K. This shows that people are really feeding animals for their own pleasure and satisfaction, not for the animals' benefit.

Fish feeding – the law ... and being bitten

Arguments for creating protected coastal areas (marine reserves) and for prohibiting fish feeding

- The Marine Reserves Act states that it is illegal to take anything from a marine reserve [Section 18 I, Para 3 (d)] or to **disturb** the marine life [Section 18 I Para4 (c)].
- It also states that the purpose of the Act is to create reserves where both scientists and the general public can study marine life in its **natural state** [Section 3 Subsections 1 & 2 (d)].

Why is the Marine Reserves Act so important?

(The need for marine resource protection)

There is an urgent need to protect:

- our nature heritage (= biodiversity)
- our marine resources (= abundance) (required for both food and pleasure)
- our natural wild habitats

The future of all these depend on a full understanding of coastal ecology and the biology of the wildlife. Discovering all of the requirements of marine life in their natural habitats may be critical to the full recovery of some wild populations.

This understanding requires meaningful studies of:

- whole environments
- defined habitats
- individual species of animals and plants
- communities of dependent animals

These studies are not possible in disturbed environments where there is too much:

- fishing and gathering
- recreational activity (such as power boating and boat anchoring)
- rubbish disposal
- water borne pollution (oil, silt, sewerage and agricultural chemicals)

Disturbance does not just mean catching, chasing and poking animals or exposing wildlife to harmful rubbish and pollutants. It can also involve activities that alter the natural behaviour of marine animals.

Marine reserves are the only parts of the ocean close to human settlement where there are opportunities for many creatures to grow and behave completely naturally. This is because the rest of the coastline is under constant pressure from:

- fishing
- recreation
- coastal development
- the run-off from farmland, industrial estates and residential developments

Changing fish behaviour

Feeding fish encourages some scavenging species to congregate in unnatural excited feeding frenzies in the shallows. They begin to associate the arrival of people at the water's edge solely with the provision of food and become little more than performing circus animals. This spoils the opportunity for everyone to enjoy the experience of watching fish behaving naturally.

Fish bite swimmers

There have been instances where larger fish, expecting to be fed whenever people enter the water, have caused considerable distress to children by biting their fingers.

- Fish learn that food is associated with the human hand and literally 'bite the hands that feed them'
- Fish are very sensitive to the smells of food and may bite fingers that have been holding food if they mistake them for a meal

Polluting the reserve with food scraps

On fine weekends during summer the marine reserve is a very popular place to visit and the beach is often crowded with hundreds, sometimes over a thousand visitors. Before it was widely known that feeding fish in the reserve was illegal and created environmental problems many engaged in this activity. It was quite common to see family groups breaking up whole loaves of bread to throw into the water along with bags of frozen peas and sometimes pieces of dog sausage or other processed meats.

Not all of the food was eaten by the fish and at the end of a busy day when most groups had returned to Auckland the uneaten debris could often be seen suspended in the shallows. There it clouded the water and looked more like the drainage effluent from a dozen kitchen sink waste disposal machines or in places as if many people had vomited into the sea. It was obviously so different from the clean clear water that normally bathes this beach.

If food is thrown in faster than fish can eat it, the scraps fall to the bottom and begin to rot making the water unpleasant to look at and swim in. Flakes and crumbs of bread break up into small fragments that cloud the water and they accumulate with other food scraps as an unpleasant scum along the water's edge.

Stuffing fish with the wrong food

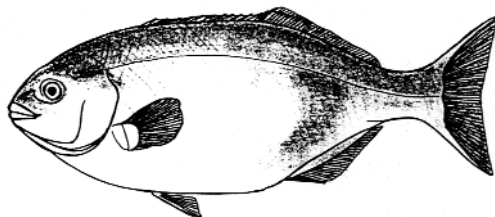
Most fish are scavengers and will gulp down any food scraps they are lucky enough to come across. In the sea this is usually the remnants of other *animals* that have died of natural causes or been killed by predators. Scavenging for food is a very competitive lifestyle and fish are preconditioned to grab and swallow any food scraps before others beat them to it. They gulp first and ask questions after.

It is most unnatural for fish to come across pieces of *carbohydrate* food, like bread or peas, in the sea but they snatch and swallow these foods out of instinct. What effect eating large quantities of these alien (and sometimes frozen) foods has on the digestive systems of fish is unknown.

It is unlikely that they will have the right cocktail of digestive enzymes in their guts to break down and gain much benefit from the heavy loads of starchy carbohydrates:

- They may become sick from having difficulty digesting the food or passing the waste through their guts
- If their guts are stuffed full of indigestible starchy foods like bread and peas they will have no room for the foods that they normally eat and need for healthy lives

Feeding the fish in a marine reserve may therefore not only be of little benefit but may actually be harmful.



First thoughts about fish feeding

Issues and attitudes – presented through role play

This exercise challenges a class to consider all the issues of fish feeding in a marine reserve, including:

- a) changing public opinion
- b) encouraging co-operation or enforcing the law

To air and compare different attitudes to:

- a) feeding fish in a marine reserve
- b) compliance with the Marine Reserves Act

Use five pairs of students to engage in *role play* in which all of the issues are raised in discussions / conversations / appeals at the water's edge of a marine reserve.

At the beach face to face approaches are necessary to address the problems but students must be advised that officious or dogmatic confrontations are likely to produce negative responses. These can be demonstrated usefully by role play too but the end goal is to use education and to foster the spirit of co-operation to achieve the desired end result.

The five pairs are:

- a. A guy who has brought his new girlfriend all the way from the city to impress her by feeding the fish. They have sliced bread and frozen peas
- b. Two snorkellers who have travelled from Auckland specifically to swim with fish in an unspoilt environment
- c. A grandfather and his young (six year old) grandchild who he has brought specially to the beach to feed the fish as a birthday treat
- d. Two research divers from the University Marine Laboratory who are studying the natural breeding and feeding behaviour of parore
- e. A Department of Conservation field officer and a trainee honorary ranger being introduced to managing compliance situations in a marine reserve

Conversations / discussions should mostly be between only two pairs at the same time and never more than three pairs. The pairs should appear in the role play in the order shown above.

Each pair should be familiar with the information presented in this document including relevant sections of the Marine Reserves Act. This will enable them to present view points that would represent how people with their particular

interests might behave and to argue their cases. A good understanding of how all sections of the public think about particular issues can often lead to better ways of managing difficult problems.

The exchanges should include the following words and phrases like illegal, it's my right, prove it, what Act?, helping the fish, the fish like it, the fish are harmed ...

Direction

The role play sessions can effectively be conducted in a 'Theatre Sports' style with the teacher taking the role of presenter / umpire / 'Clive Anderson' and the class serving as a participating audience stimulating the role players with constructive challenges whenever their performances or presentation of ideas are weak.

Familiarity with relevant sections of the Marine Reserves Act

Students should be familiar with relevant parts of the Marine Reserves Act 1971 reproduced in this resource, in particular, details of the sections:

Section 2: Interpretation – definitions of 'Marine life', 'Marine reserve', 'Taking', etc

Section 3: Marine reserves to be maintained in natural state, and public to have right of entry. These are the defined purposes of the act, eg for:

- scientific study
- preservation and protection of the marine life and its natural habitat
- the public to enjoy the opportunity to study, observe and record marine life in its natural habitat

Section 3,18 I: Offences (and penalties), especially:

- (2) offence of depositing into a marine reserve any substance or article of any kind injurious to marine life
- (3) (c) offence of wilfully disturbing any marine life
- (5) offences of not complying with a ranger's instructions or obstructing, threatening or using abusive language to a ranger, etc

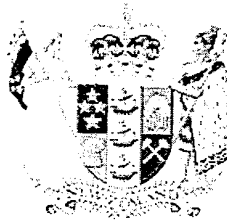


Copies of sections of the Act included on the following pages have been highlighted to emphasise clauses or sentences that are directly relevant to arguments about disturbance by feeding fish in a marine reserve.

The following 8 pages are actual copies of selected pages from the Marine Reserves Act 1971. They have been included in this kit for photocopying to show students what an Act of Parliament looks like, including the care taken with definitions and matters covered.

These pages selected also cover aspects of 'disturbance of marine life' for use in the context of the illegal practise of feeding fish in a marine reserve. Relevant passages have been underlined.

Marine Reserve Act 1971



Public Act 1971 No 15
(RS Vol 36, p 485) * (1)

NOTE: 1. This Act is specified as being an Act under which consents for environmental purposes may be granted and the Ministry for the Environment has the function to provide the Government, its agencies, and other public authorities with advice on the application, operation and effectiveness of this Act in relation to the achievement of the objectives of the Environment Act 1986. See 1986 No 127, s2, s31(c)(i) and Schedule.

2. Persons exercising powers or carrying out functions under this Act for the Hauraki Gulf to have particular regard to the provisions of s7 and s8 of the Hauraki Gulf Maritime Park Act 2000 (2000 No 1). See 2000 No 1, s13.

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1996 No 88-	Fisheries Act 1996 s316(1) & (4)
SR 1996/255-	Fisheries Act Commencement Order 1996 (No 2): cl.22
1995 No 31-	Ministry of Agriculture and Fisheries (Restructuring) Act 1995:

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Marine Reserves Act 1971

Public Act 1971 No 15

An Act to provide for the setting up and management of areas of the sea and foreshore as marine reserves for the purpose of preserving them in their natural state as the habitat of marine life for scientific study.

[20 September 1971

1. Short Title

This Act may be cited as the Marine Reserve Act 1971.

2 Interpretation

In this Act, unless the context otherwise requires,-

Area means any part of-

- (a) The seabed vertically below an area the surface of-
 - (i) The territorial sea of New Zealand []; or
 - (ii) The internal waters of New Zealand as defined by section 4 of [the Territorial Sea and Exclusive Economic Zone Act 1977]; or
- (b) The foreshore of the coast of New Zealand;-
and includes any water at any material time upon or vertically above it:

[**Board** means a Conservation Board established under section 6L of the Conservation Act 1987:]

[**Conservation Authority** means the New Zealand Conservation Authority established under section 6A of the Conservation Act 1987:]

[**Conservation management plan** means a conservation management plan approved under section 8 of this Act:]

Conservation management strategy means a conservation management strategy approved under section 17F of the Conservation Act 1987:]

[**Department** means the Department of Conservation:

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Director –General means the Director-General of Conservation:]

[**Firearm** means anything from which any shot, bullet, missile, or other projectile can be discharged (whether or not by force of explosive); and includes any firearm as defined in section 2 of the Arms Act 1983; and **to shoot** has a corresponding meaning:]

Hunt of Kill: Definition repealed.

Marine Life means any species of the plant or animal kingdom which at any time of the life of the species inhabits the sea or foreshore; and includes any specimen of the species whether alive or dead, and any part of any specimen, and the seed, spores, eggs, spawn, young, fry, and offspring of the species; but does not include wildlife within the meaning of the Wildlife Act 1953:

Marine reserve or reserve means a marine reserve constituted under section 4 of this Act:

Mining interest means –

- (a) A coal mining right within the meaning of the [Coal Mines Act 1979]:
- (b) A mining licence or prospecting licence within the meaning of the Petroleum Act 1937:
- (c) Any authority to prospect or mine for ironsands granted by the [the Ministry of Energy] pursuant to section 3 of the Iron and Steel Industry Act 1959, and any authority to enter on land given by him pursuant to section 6 of that Act, and any right to prospect or mine for ironsands which by virtue of section 5 of that Act may continue to be exercised as if the said section 3 had not been passed:
- (d) While the Mining Act 1926 continues in force, a mining privilege within the meaning of that Act:
- (e) After the commencement of the Mining Act 1971, a mining privilege within the meaning of the Act:
- (f) Any licence issued under section 5 of the Continental Shelf Act 1964 to prospect or mine for any mineral, or carry on any operations for the recovery of any mineral:
- (g) Any right to prospect or mine for minerals conferred by any other enactment or by any instrument.

[**Minister** means the Minister of Conservation:]

Ranger means a ranger appointed or deemed to be appointed under this Act:

[Sell includes—

- (a) Barter and any form of exchange for consideration:
- (b) Offering or attempting to sell:
- (c) Receiving for sale or having in possession for sale:
- (d) Exposing for sale:
- (e) Sending or delivering for sale:
- (f) Causing or allowing to be sold, offered for sale, or exposed for sale;—
and **sale** and **sold** have corresponding meanings:

Taking, in relation to any marine life, includes taking, catching, fishing, killing, or pursuing by any means or device; and, in relation to any plant, includes uprooting and transplanting; and also includes any attempt at taking; and **to take** has a corresponding meaning:

Use includes any attempt to use or assistance given or attempted to be given in using.

Hist. “Area”: Para.(a)(i), words omitted by s33(1) of the Territorial Sea and Exclusive Economic Zone Act 1977, and in para. (a)(ii) omitted words “that Act” and substituted words “the Territorial Sea and Exclusive Economic Zone Act 1977” by s33(1) of that Act.

Hist. “Board”: Definition inserted on 10 April 1990 by 1990 No 31 (2), s49.

Hist “Conservation Authority”: Definition inserted on 10 April 1990 by 1990 No 31 (3), s49.

Hist “Conservation management plan”: Definition inserted on 10 April 1990 by 1990 No 31 (3), s49.

Hist “Department” and “Director-General”: Definitions repealed and substituted by s65(1) of the Conservation Act 1987.

Hist. “Department” and “Director-General”: Definitions inserted by s6(1) of the Ministry of Agriculture and Fisheries Amendment Act 1972

Hist. “Firearm”: Definition repealed and substituted on 1 October 1996 by 1996 No 88(6), s3161(1) & SR 1996/255/2. The repealed definition is listed below for reference.

“Firearm’ means any kind of weapon or device from which any shot, bullet, arrow, spear, stone, or other missile can be discharged in the air or under water; and ‘to shoot’ has a corresponding meaning.”

Hist. “Hunt to Kill”: Definition repealed on 1 October 1996 by 1996 No 88(7), s316(1) & SR1996/255/2. The repealed definition is listed below for reference.

“Hunt or kill’, in relation to any marine life, included hunting, fishing, killing, taking, trapping, or capturing by any means; and also includes pursuing, disturbing, or molesting, or taking or using a firearm, spear, or other method to hunt or kill whether marine life is thereby killed or captured or not; and also includes every attempt to hunt or kill and every act of assisting any other person to hunt or kill.”

Hist. “Mining interest” :Para. (a), reference to “Coal Mines Act 1979” substituted for reference to repealed “Coal Mines Act 1925”, being the corresponding enactment, on 1 April 1980 by 1979 No 21(8), s268(2) & 1924 No 11, s21(1)

Hist. “Mining interest”: Para. (c), reference “Minister of Energy” substituted for a reference to “Minister of Mines” by s16(2) (a) of the Ministry of Energy Act 1977.

Hist. “Minister”: Definition repealed and substituted on 1 April 1987 by 1987 No 65(9), s65(1). The repealed definition is listed below for reference.

“Minister’ means the Minister of Agriculture and Fisheries:”

Hist. “Minister”: Definition repealed and substituted on 1 September 1972 by 1972 No 3(10), s6(1). The repealed definition is listed below doe reference.

“Minister means the Minister of Marine:”

Hist. “Secretary for Marine”: Definition repealed by s6(1) of the Ministry of Agriculture and Fisheries Amendment Act 1972.

Hist. “Sell”: Definition inserted on 1 October 1996 No 88(11), s 316(1) & SR 1996/255/2

3 Marine Reserve to be Maintained In Natural State, and Public to have Right of Entry

(1) It is hereby declared that the provisions of this Act shall have effect for the purpose of preserving, as marine reserves for the scientific study of marine life, areas of New Zealand that contain underwater scenery, natural features, or marine life, of such

distinctive quantity, or so typical, or beautiful, or unique, that their continued preservation is in the national interest.

(2) It is hereby further declared that, having regard to the general purpose specified in subsection (1) of this section, marine reserves shall be so administered and maintained under the provisions of this Act that-

- (a) They shall be preserved as far as possible in their natural state:
- (b) The marine life of the reserves shall as far as possible be protected and preserved:
- (c) The value of the marine reserves as the natural habitat of marine life shall as far as possible be maintained:
- (d) Subject to the provisions of this Act and to the imposition of such conditions and restrictions as may be necessary for the preservation of the marine life or for the welfare in general of the reserves, the public shall have freedom of access and entry to the reserves, so that they may enjoy in full measure the opportunity to study, observe, and record marine life in its natural habitat.

[(3) For the purpose of this section but subject to any authorisation given under section 11(b) of this Act, no person shall fish in a marine reserve except-

- (a) Persons (not being persons holding a permit issued under Part 4 of the Fisheries Act 1983) authorised by notice in the Gazette given by the Minister after having regard to the purpose specified in subsection (1) of this section; and
{Editorial Note: For authorised persons re-
Poor Knights Islands see SR 1989/384 (expired):
Tuhua (Mayor Island) see SR 1993/42.}
- (b) In accordance with such conditions as to time, place, species of fish, methods, and gear to be used in fishing, as may be specified in the notice; and
- (c) Where not inconsistent with any conditions imposed under paragraph (b) of this subsection. In compliance with restrictions imposed on fishing by the Fisheries Act 1983 and any regulations made under it.]]

[(4) Nothing in this section shall apply to prohibit any person from fishing in the reserve in accordance with any conditions imposed by any Order in Council made under section 5 of this Act.]

Hist. s3(3) repealed and substituted on 10 April 1990 by 1990 No 31(12), s50. The repealed

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other order made under that subsection in respect of the same forfeit property, has the effect of allowing less than 40 percent of the value of the forfeit property to remain forfeit to the Crown.

- (10) Subsection (9) of this section does not prevent the return of up to 100 percent of the value of any forfeit property to any power of property other than the person convicted of the offence in respect of which the property was forfeit.
- (11) Without limiting subsection (7) of this section, any order under that subsection may order one or more of the following:
- (a) The retention of the forfeit property by the Crown
 - (b) The return of some or all of the forfeit property to the owner at the time of forfeiture, with or without the prior payment to the Crown of a sum of money:
 - (c) The sale of some or all of the forfeit property, with directions as to the manner of sale and dispersal of proceeds:
 - (d) The delivery of some or all of the forfeit property to a person with an interest in the property, with or without directions as to payment of a sum of money to specified persons (including the Crown) prior to such delivery:
 - (e) The reinstatement (notwithstanding the forfeiture) of any interest that was forfeit or cancelled as a result of a forfeiture.
- (12) This section does not require the Crown to pay, or secure the payment of, any sum of money to any person claiming an interest in forfeit property under a court order made under subsection (7) of this section.
- (13) For the purpose of assisting the Court in determining any application for relief, the Director-General and any employee or agent of the Ministry is entitled to appear before the Court and be heard.
- (14) Any forfeiture under section 18G of this Act, or any payment of a sum of money or delivery of property under subsection (7) of this section, to persons claiming an interest, shall be in addition to, and not in substitution for, any other penalty that may be imposed by the Court or by this Act.]
- Hist. s18 & s19 repealed & s18 –s 18J substituted on 1 October 1996 by 1996 No 88(48), s316(1) & SR 1996/255/2

[18] Offences

- (1) Every person commits an offence against this Act and is liable to imprisonment for a term not exceeding 3 months or to a fine not exceeding \$250,000, or to both, who, without lawful authority or reasonable excuse, takes or removes from a marine reserve for commercial purposes any marine life.
- (2) Every person commits an offence against this Act and is liable to imprisonment for a term not exceeding 3 months or to a fine not exceeding \$50,000, or to both, who without lawful authority or reasonable excuse, discharges or causes to be discharged or deposits, whether directly or indirectly, in or into a marine reserve any toxic substance or pollutant or other substance or article of any kind injurious to marine life.
- (3) Every person commits an offence against this Act and is liable to imprisonment for a term not exceeding 3 months or to a fine not exceeding \$10,000, or to both, who, without lawful authority or reasonable excuse,—
 - (a) Introduces in or into a marine reserve any living organism; or
 - (b) Wilfully damages or wilfully injures any marine life, or wilfully damages the foreshore or seabed, or any of the natural features in a marine reserve; or
 - (c) Uses in a marine reserve any explosive; or
 - (d) Takes or removes from a marine reserve any marine life, mineral, sand, shingle or other natural material or thing of any kind.
- (4) Every person commits an offence against this Act and is liable to imprisonment for a term not exceeding 3 months or to a fine not exceeding \$5,000, or to both, who, without lawful authority or reasonable excuse,—
 - (a) Discharges any firearm in or into a marine reserve; or
 - (b) Erects any structure in or over a marine reserve; or
 - (c) Wilfully interferes with or wilfully disturbs in a marine reserve any marine life, foreshore or seabed, or any of the natural features.
- (5) Every person commits an offence against this Act and is liable to imprisonment for a term not exceeding 3 months or to a fine not exceeding \$2,500, or to both, who, without lawful authority or reasonable excuse,—
 - (a) Deposits or throws in or into a marine reserve any rubbish, except in a place or receptacle approved and provided by the Director-General; or
 - (b) Uses, sells, or otherwise disposes of, or is in possession of, any marine life,

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