SECTION 10:

INFORMATION PRINCIPLES

Summary

1 All decisions under the Fisheries Act (the Act) that relate to the utilisation of fisheries resources or ensuring sustainability must provide for the information principles set out in s10

2 The ability to exercise caution in the absence of adequate information does not negate the need to collect further quality information

3 The fact that a dispute exists as to the basic material upon which the decision must rest does not mean that necessarily the most conservative approach must be adopted

4 The cautious approach that s10 requires decision makers to take, when information is uncertain, is in relation to *both* the utilisation of the resource as well as its sustainability

5 The knowledge held by non-scientific stakeholders needs to be recognised as an essential element of the problem solving process

Purpose of this Policy Definition

6 The purpose of this policy definition is to provide an interpretation of the information principles and guidance for their application.

Background and scope of legislative provisions

7 Section 10 sets out the information principles that must be taken into account by all persons exercising or performing functions, duties, or powers under this Act, in relation to the utilisation of fisheries resources or ensuring sustainability.

8 The principles are:

- Decisions should be based on the best available information
- Decision makers should consider any uncertainty in the information available in any case
- Decision makers should be cautious when information is uncertain, unreliable, or inadequate
- The absence of, or uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act

9 Sections 2 and 8 of the Act provides the following definitions of terms used in s10:

> "Best available information" means the best information that, in the particular circumstances, is available without unreasonable cost, effort or time.
>
> "Information" includes –
> (a) Scientific, customary Maori, social or economic information; and
> (b) Any analysis of any such information.
>
> "Ensuring sustainability means -
> (a) Maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and
> (b) Avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment.
>
> "Utilisation" means conserving, using, enhancing and developing fisheries resources to enable people to provide for their social, economic, and cultural well-being.

Legislative intent

10 Part II of the Act outlines the purpose and principles.

11 The purpose of the Act is to provide for the utilisation of fisheries resources while ensuring sustainability.

12 In exercising or performing functions, duties or powers under the Act, in relation to the utilisation of fisheries resources or ensuring sustainability, environmental and information principles have to be taken into account.

13 Section 10 provides recognition that when making decisions there is always going to be some level of uncertainty. That uncertainty could be in relation to the information on which the decision is being made, the existence of a risk / threat, or as in many cases, uncertainty in both these areas.

14 Section 10 highlights that it is appropriate for decision makers to be cautious in the face of uncertainty to ensure sustainability and provide for utilisation.

Relevant policy Issues and proposed principles

15 Before launching into a detailed consideration of the information principles, set out in section 10, it is necessary to consider the approaches available to policy makers when information is uncertainty and the phrase "shall take into account"

The Management of Uncertainty

16 There are a number of potential approaches to managing uncertainty in information, these are outlined below:

The precautionary principle/approach

17 The precautionary principle emerged from the former West Germany during the 1970s as the concept of *Vorsorge*. "In general, vorsorge comes into play when the risks of environmental

damage are not (yet) identifiable, or even in the absence of risk. In principle, vorsorge implies that authorities should move to minimise all [environmental] risks.[1]"

18 Since then the precautionary principle seems to taken on a life of its very own. It is now incorporated into almost all new international "hard law' treaties and conventions and can also be found in Ministerial declarations, and other examples of international 'soft law'[2]. The exact order and form of words varies. In each of these instruments different interpretations give slightly different emphasis to considerations of risk, economic cost and technical feasibility.[3]

19 The difference between the precautionary principle and the precautionary approach seems to be the level of emphasis given to the above considerations. At one end is the precautionary principle which is more idealistic and when applied is highly preservationist (eg zero tolerance of risk) while the precautionary approach places more emphasis on balancing risk with the social, cultural and economic costs—although the precautionary approach does offer a "a strong presumption in favour of high environmental protection…"[4].

20 The Act (Part II in particular), promotes a precautionary approach to fisheries management in New Zealand. Section 8 requires that utilisation be constrained by the requirement to ensure sustainability. Section 9 sets out environmental principles that need to be taken into account in relation to the utilisation of our fisheries resources and ensuring sustainability. And section 10 requires that decisions should be based on the best available information and that when there is uncertainty or lack of information decision makers should be cautious.

21 It important to note that the cautious approach that s10 requires decision-makers to take (s10c) is in relation to *both* the utilisation of the resource as well as its sustainability. This is wider than simply the "precautionary approach" as acknowledged in international literature and law, which is geared towards cautious management to minimise environmental risks.

22 An example of how the precautionary approach can be put into practice is highlighted in *Trio Holdings v Marlborough District Council* w103a/96 NZRMA [1997] where the Planning Tribunal (as it was then) held that:

> Applying a precautionary approach, an assumption could be made that the northernmost marine farm would modify the habitat of the witch flounder upon which the king shag feed. While *there was no clear evidence* of the importance of the site for the shags', continual survival, the deletion of the northernmost site from the proposal would ensure a zone of protection around its feeding grounds.

23 And later noted:

> We concluded that in this respect it was better to *err on the side of an abundance of caution* for the species population of this bird is *too rare* to upset. (emphasis added)

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[1]. O'Riordan,T. and Cameron, J. 1994. Interpreting the Precautionary Principle. Earthscan Publications Ltd, London. p315.

[2] Appendix 1 outlines the hard law and soft law documents that make reference to the precautionary principle and/or the precautionary approach.

[3] Jordan, A and O'Rordan T 1994 "The precautionary principle in U.K. environmental law and policy" **in** CSERGE Working Paper GEC. Centre for Social and Economic Research on the Global Environment. University of East Anglia and University College London

[4] ibid

Other approaches to managing uncertainty (in conjunction with the precautionary approach)

24 In addition to the precautionary principle and further research, Dover and Handmer[5] and others[6] outline existing techniques and approaches used to assist with managing in the face of uncertainty:

- quantitative risk assessment
- ecological risk assessment
- techniques in cost-benefit analysis (safe minimum standards)
- environmental performance bonds
- no-regrets options

25 These types of techniques can reduce the level of uncertainty in some situations where there is a certain type of uncertainty[7] (see paragraphs 58-63 on the different forms of uncertainty). That is, decision making may be advanced in situations where there are discrete problems that have measurable processes (ie by increasing knowledge) but may not in situations with complex immeasurable problems.[8]

The requirements of: "shall take into account"

26 "Shall take into account" means, "to take into consideration or to allow for a particular matter in the actual decision". The decision-maker is required to *provide* for the matters outlined rather than simply turn their minds to the matter (as required by the words "have regard to"). Every decision made in relation to the utilisation or sustainability of fisheries should strive to ensure that the information principles are complied with.[9]

27 Documentation of the information sought and the consideration given to that information is important to demonstrate how the information was taken into account.

Using best available information – s10(a*)*

28 Section 10(a) states that "decisions should be based on the best available information". This principle sets a "goal" of the Act to have all decisions made after consideration of the best information available on the matter for which the decision is to be made.

29 A number of issues to be considered in relation to the concept of "best available information" include:

- The availability of information
- The variety of available information
- The quality of the best available information

Information availability

30 Before considering what information is the 'best available' you need to ascertain what information is 'available without unreasonable cost, effort or time'.

[5] Dover, S. R. and Handmer, J. W. 1995. Ignorance, the Precautionary Principle, and Sustainability. *Ambio* 24(2).
[6] See Ministry for the Environment's Comparative Risk Assessment Scoping Study (CRSS) – Working Paper No. 2 – Uncertainty and Environmental Policy Development: A Critical Conspectus
[7] Dover, S. R. and Handmer, J. W. 1995 op. cit. and Ministry for the Environment op. cit.
[8] Dover, S. R. and Handmer, J. W. op. cit.
[9] Legal Opinion P96255, K Taylor pp.-9

31 Information availability is subject to a variety of potential restrictions such as commercial sensitivity, lack of appropriate protocols and procedures to safeguard customary Maori information,[10] as well as the difficulty and complexity of collecting and analysing the information.

32 What will be considered reasonable cost, effort and time in relation to *making information* available are matters to be determined at the time of collection, having regard to all the circumstances[11]. However a number of factors that may influence the *availability* of information include:

- The level of risk/threat to achieving the purpose of the Act
- The information requirements of the particular section under which a decision is being made
- The importance of the information to the decision maker

33 In relation to the first point, the level of risk to achieving the purpose of the Act, the principle of exercising caution (s10(c)) may mean that in some cases it is considered more reasonable to act more cautiously, both in relation to ensuring sustainable and providing for utilisation, rather than require further information.

34 The ability to exercise caution in the absence of adequate information should not however, be seen as an excuse for not making information available in the future. The more adequate the information the better the decision making. After all, one of the greatest risk is where a risk to achieving the purpose of the Act has not been identified. The potential for this type of risk to occur maintains the need for ongoing information collection as future research might identify risks never considered.

The variety of available information

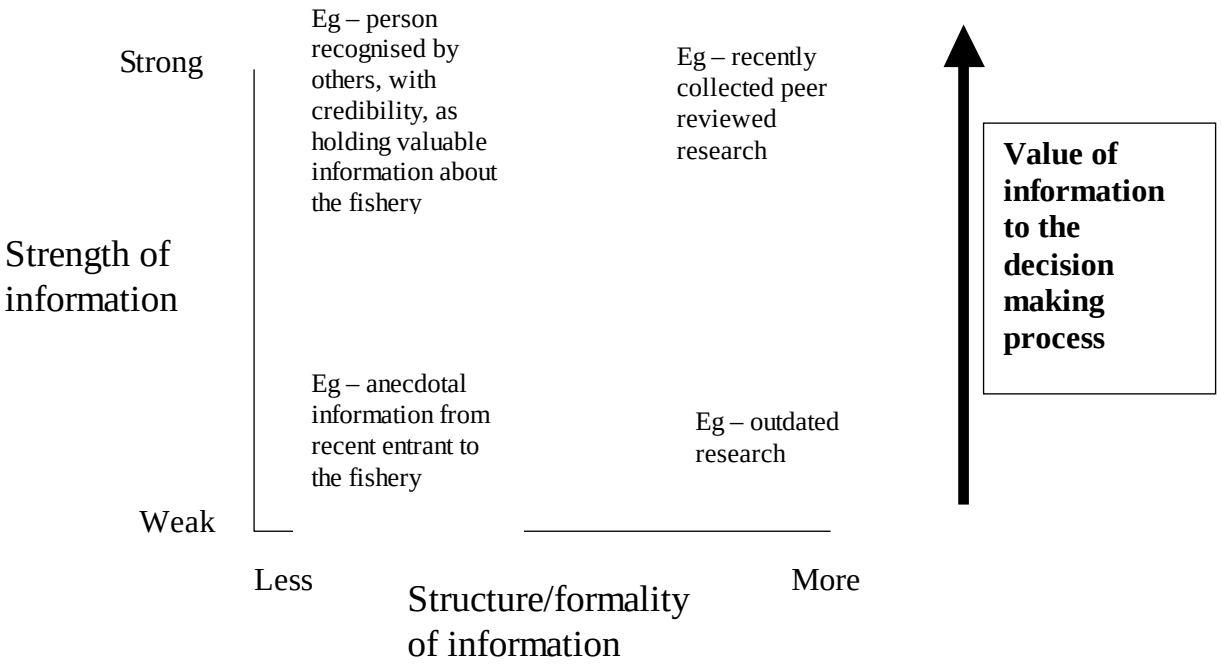
35 Section 2 of the Act defines information to include scientific, customary Maori, social, or economic information; and any analysis of that information. This paper will consider scientific information to refer to biological/ecological information as other types of scientific information such as economic and social are already specifically referred to by the definition of information.

36 For each of these different information types the available information may be in many different forms. For example, biological/ecological information could be available as an outdated piece of peer reviewed research or in the form of established members of a fishery advising the Ministry that the productivity of the fishery is decreasing (or a number of other similar permutations).

37 It is impossible to say that structured information, such as peer reviewed research, is inherently better than less structured information, such as information from established members of a fishery/community. Figure 1 highlights that it is the strength of the information and not the structure or formality of the information that is valuable in the decision making process.

[10] MFish needs to establish business processes that accommodate the contexts of information types and put in place information management systems that acknowledge and provide for the institutional characteristics surrounding provision of each desired information type.
[11] Legal Opinion P96255, K Taylor pp.10-11.

Figure 1: Value to the decision making process



38 Appendix 2 provides some characteristics to guide the assessment of the strength (or not) of this information.

The quality of the "best available information"

39 The previous section highlighted that the best available information will vary depending on the case at hand.

40 After an assessment of the strength of the different types of information has been made an assessment needs to be made of the quality of the information as a whole. This could be achieved by establishing a continuum from "good" to not so good" information, against which to measure information. Table 2 sets out criteria that could be used to guide this assessment.

Table 2: Suggested criteria for assessing the quality of the "best available information"[12]

CHARACTERISTIC	GOOD	NOT SO GOOD
INFORMATION QUALITY CHARACTERISTICS		
Information availability	• All relevant information is available	• Little or no relevant information is available, i.e. refusal to provide information
Information provision	• Information provided from all required sources e.g. all stakeholders if required, or of all types. In some cases only scientific information may be deemed required etc.	• Information not gained from all desired sources
Information relevance	• Issue fully scoped for information requirements related to decision making provision • Information gained relevant to the scoping requirements	• Information requirements poorly known related to decision making provision • Information gained largely irrelevant
Timing	• Information can be provided with sufficient time to meet statutory and information quality requirements	• Information cannot be provided on time to meet statutory and information quality requirements

41 Where on the continuum the "best available information" falls is one factor that will influence the level of caution required in decision making, in line with s10(c) and (d). Another important factor that will influence the level of caution is the consequence of the decision. For example, if there is uncertainty in the information and the consequences of an inappropriate decision are high then more caution should be exercised than if the consequences of the decision are less.

42 At one end of the continuum (GOOD) information is generally characterised by:

- being the best available;
- a high level of certainty, reliability, and adequacy;
- a sufficient amount of information characterised by a high degree of certainty.

43 At this end of the continuum decisions can be made that achieve the purpose of the Act, with confidence, and with less need to exercise caution—in relation to interpreting the information as required by s10(c).[13]

44 At the other end of the continuum (NOT SO GOOD) information is generally characterised by:

- being the best available;
- a high level of uncertainty, unreliability, and inadequacy;
- an insufficient amount of information characterised by a high degree of uncertainty.

[12] adapted from Hughey K, 1998. *Guidelines for implementing the information principles of section 10 of the Fisheries Act: A discussion paper*. pp4. Resource Management Group, Environmental Management and Design Division, Lincoln University. (Contract report to MFish)

[13] When information is more certain, less caution is required as the available information provides stronger guidance as to the appropriate decision in order to achieve the purpose of the Act. In situations where the information is more certain, the consequences of a decision also plays an important role in determining the appropriate response.

45 At this end of the continuum decisions are still to be made, subject to the exercise of a strongly cautious approach, both to achieving the purpose of the Act and to the weight given the information.

46 The continuum highlights that the best available information may still be characterised by uncertainty, unreliability and inadequacy.

Considering uncertainty – s10(b)

47 Section 10(b) states, "decision makers should consider any uncertainty in the information available in any case".

48 Recently there has been a considerable amount of work on defining the concept of uncertainty.[14,15,16] One conclusion common to this work is that uncertainty or ignorance is not single dimensional but rather multifaceted. Very simply put this work considers uncertainty/ignorance as ranging from quantifiable uncertainty through to ignorance that defies prediction. Within this range the studies also acknowledge the existence of unrealised uncertainty/ignorance.

49 The relevant points from this work are:

- Uncertainty/ignorance is not unitary, but comprise different types of aspects
- There always will be ignorance that is for practical purposes irreducible
- The notion of absolute ignorance (closed ignorance, irrelevance, surprise)

50 See Appendix 3 for the nomenclature that some of the studies have used to classify the different forms of uncertainty. And Appendix 4 for different sources of uncertainty.

51 The implications for considering uncertainty/ignorance in this multi-faceted manor is the type of information used in the policy decision making process. That is, as uncertainty/ignorance moves into the realm of unpredictability the "expert [and the expert's tools to reduce uncertainty] should have no more privilege or standing than the lay-person in the policy development process"[17]

52 The importance of "non-expert" input into the decision making process was acknowledged earlier in the discussion on the different types of information (sections ? through to ??). In that discussion the importance of the "strength" of the information and not the "structure/formality" of this information was highlighted.

Exercising caution – s10(c)

53 Section 10(c) states that "decision makers should be cautious when information is uncertain, unreliable or inadequate".

[14] Dover, S. R. and Handmer, J. W. 1995. Ignorance, the Precautionary Principle, and Sustainability. *Ambio* 24(2).
[15] Dover, S. R. 1995. Risk and Uncertainty in Environmental Management. In: Proceedings of the 1995 Australian Academy of Science Fenner Conference on the Environment.
[16] See Ministry for the Environment's Comparative Risk Assessment Scoping Study – Working Paper No. 2 – Uncertainty and Environmental Policy Development: A Critical Conspectus.
[17] ibid

54 Gallen J of the High Court in *Greenpeace New Zealand Inc v Minister of Fisheries* gives clear guidance when it comes to interpreting this section:

> to state that something must be approached with caution means just that. The fact that a dispute exists as to the basic material upon which the decision must rest, does not mean that necessarily the most conservative approach must be adopted. The obligation is to consider the material and decide upon the weight which can be given it with such care as the situation requires.

Making decisions in the absence of certainty – s10(d)

55 It is clear from s10(d) that a lack of information or certainty of information should not be used as reason for postponing or failing to take appropriate management measures to further the purpose of the Act.

56 Part II of the Act and our international obligations direct that a precautionary approach be taken to decision making when faced with uncertainty. But as discussed earlier in paragraph 32, s10 is wider than the precautionary approach. It requires that decision makers are cautious in relation to *both* ensuring sustainability as well as providing for utilisation.

57 Paragraphs 34 and 35 outline other techniques and approaches that can be used (in conjunction with a precautionary approach) to reduce uncertainty. While these techniques expand out knowledge of the natural systems and their interactions with the human system their use is confined to certain types of measurable/identifiable uncertainty and add little to the decision making process in situations of irreducible/ indeterminate uncertainty.

58 In these latter situations it is promoted that:

> "the knowledge held by non-scientific stakeholders needs to be recognised as an essential element of the problem solving process".

Proposed guidelines for applying the information principles

59 The following are policy guidelines for applying the principles of s10:

- The principles have to be *taken into account*. This requires the decision maker to document how they have given explicit consideration to the principles and provided for them in making their decisions.

- An assessment of the availability of information should be carried out on the basis of cost, effort and time. This includes justification of the methods of information collection pursued, (e.g. consultation, formal research), who incurs the cost, the time frame available for information collection and so forth.

- Ongoing information availability should then be weighted against the risk to achieving the purpose of the Act.

- The "best available" information does not necessarily equate with "good information".

- Determine the "state" of the information to establish: (a) that the best available information is being used, and (b) where on the information continuum that information falls in order that the decision maker has a guide to the amount of caution required.

- When making a decision consider the reliability and adequacy of the best information available, exercising caution accordingly.

- Where the best available information is inadequate, unreliable, uncertain or insufficient the decision-maker shall exercise a high level of caution.

- Where information is at this, 'not so good', end of the spectrum, the information must be shown to have been considered but decisions do not necessarily have to be based on this unreliable and uncertain information.

- The ability to exercise caution in the absence of adequate information should not be seen as an excuse for not acquiring/sourcing more information in the future. The more adequate the information the better the decision making.

- When making decisions in relation to achieving the purpose of the Act, tolerable ranges of risk or impact will need to be determined in conjunction with stakeholders in order to determine the level of caution.

- A lack of information or a lack of certainty in information is not an excuse, in itself, for not making a decision to achieve the purpose of the Act. Decisions can be made even when there is a lack of information by (a) exercising an appropriate amount of caution, and (b) undertaking to make available that information the decision maker considers can reasonably be made available for future decision making.

Links to other parts of the Fisheries Act

60 Although s10 is an overarching provision of the Act, its strongest linkages are with Parts II and III of the Act.

Part II

61 Section 10 makes an explicit reference back to the purpose of the Act in s10(d). It ensures that policy makers can not advance the lack of information, or uncertainty of information, as a reason not making decisions to achieve the dual purpose of the Act—to provide for utilisation and ensure sustainability.

62 The principles set out in s10 prevents the situation whereby uncertainty in information could be used to delay the introduction of environmental protection programmes and provides for caution where a decision may have adverse environmental effects.

Part III

63 The principles stated in s10 are fundamental to the operation of Part III of the Act. Information is core to performing function, duties or powers under sections contained in Part III.

64 Some sections provide further guidance as to what is considered best information in particular circumstances. This guidance should be reflected in the types of information pursued (see policy definitions for sections 11 and 13).

65 Section 10 also impacts on the "back end" sections of the Act. Specific mention will be made in relation to the QMS operation and related sections, taiapure/customary fishing sections, offence and penalty sections and the cost recovery sections.

QMS operation and related sections

66 The debate is still raging within the devolution/registry project with regard to the application of s10 to these sections. The issue was raised in relation to the use of s10 in QMS balancing. The project sponsor and legal services are working through the issue. As policy definitions are still being draft for this project the extent of the implications of s10 to these sections has not yet been fully realised.

Taiapure/customary fishing sections

67 Section 10 has positive implications for the customary fishing provisions of the Act (Part IX). It provides for a wide variety of information to be considered when performing functions, duties and powers under the Act, including scientific information, customary Maori knowledge and social or economic information. As discussed in section ??? it is the "strength" of this information and not its format or the way it is delivered or accessed.

68 Much of the information that inputs into decisions relating to customary fishing (including taiapure and mataitai etc) will be anecdotal in nature and based on the observations of local fisheries over long periods of time. Secction 10 puts this type of information on a level playing field with Western scientific information that, in the past, has traditionally been seen as the only basis on which to make fisheries management decisions.

Offence and penalty sections

69 Seeking a legal opinion as to how this section relates to the duties powers and functions of fisheries officers – requested 22 May 2000.

Cost recovery sections

70 The implications of s10 to the "back end" sections have only been dealt with lightly. In most cases the implications are probably going to be general (as in the case with the customary provisions of the Act) rather than specific (as is the case with QMS balancing). However, as people perform functions, duties and powers under the different "back end" sections of the Act active consideration will need to be given to s10 implications. Remembering that, as with QMS balancing, the potential implications might not necessarily be that obvious.

Appendix 1: The inclusion of the precautionary principle/approach in international hard and soft law

The Rio Declaration, 1992

- Principle 15

Agenda 21, (UN Conference on Environment and Development, UNCED)

- Chapter 17

Agreement for the Implementation of the United Nations Convention on the Law of the Sea.

Relating to the Conservation and management of Straddling Fish Stocks and Highly Migratory Fish Stocks 1995. (commonly referred to as UNIA, or UNFSA or the Fish Stocks Agreement) UN Fisheries Convention

- Article 6

UN Food and Agriculture Organisation (FAO) Code of Conduct for Responsible Fishing, 1995

- s 6.5
- s7.2.2

United Nations Convention on Biodiversity

- reference in preamble

Appendix 2: A guide for assessing the rigour of the information.[18]

More Structured		Less Structured	
Strong	*Weak*	*Strong*	*Weak*
• Recently gained	• Outdated	• Had accurate / reliable info. from source previously	• Source previously provided erroneous info.
• Scientifically defendable (ie explicit treatment of risk and uncertainty, adequate and reliable data)	• Questionable science (ie no treatment of risk and uncertainty and inadequate and unreliable data)	• Source been involved with the area / fishery for a long time	• Source only recently involved with the fishery / area
• Data and analysis subject to independent peer review	• Date and analysis not subject to independent peer review	• Credibility/mana of source (eg kaitiaki)	• Source lacks credibility
• Highly comprehensive	• Narrow focus	• Source has no vested interest in providing such information	• Source has vested interest in providing information
• Replicable methodology	• Non-replicable	• Information coming from significant portion of players	• Comments coming from only a few players
• Assumptions and limitations stated	• Assumptions and limitations not stated	• Views substantiated by independent other players	• Views not supported by others
• Unbiased	• Biased	• Rationale for conclusion provided	• Rationale for conclusion not provided

[18] adapted from Hughey K, 1998 op. cit.

Appendix 3: The nomenclature in describing uncertainty/ignoramce

Wynne's taxonomy of uncertainty[19]:

Risk – system behaviour is basically known, and outcomes can be assigned a probablistic value

Uncertainty – important system parameters are known, but no the probability distribution

Ignorance – what is not known is not know; and the degree increases when the level of action or commitment based on what we think we know increases

Indeterminancy – casual chains, networks or processes are open, and thus defy prediction

Faber et al.'s taxonomy of ignorance[20]

Closed (unrealised) ignorance

Open (realised) ignorance

- *Reducible*
- Personal
- Communal
- *Irreducible*
- Complexity (chaos)
- Novelty (genotypic change)

Taxonomy of ignorance adapted from Smithson[21]

Irrelevance (to ignore)
- Untopicality (outside cognitive/intuitive domain)
- Undecidability (believed insoluble/not requiring verification)
- Taboo (socially enforced ignorance)

Error (to be ignorant of)
- Distortion (of knowledge)
- Confusion (distortion via wrongful substitution)
- Inaccuracy (distortion in degree)
- Incompleteness (of knowledge)
- Absence (incompleteness in degree)
- Probability (risk)
- Vagueness (indescribability)

[19] see Wynne, B. 1992. Uncertainty and environmental learning: reconceiving science and policy in the preventative paradigm. *Global Environ. Change* Vol 2. 111-127. Cited Dover, S. R. and Handmer, J. W. 1995 op. cit.

[20] see Faber, M.,Manstetten, R. and Proops, J. 1992. Toward an open future: ignorance, novelty and evolution. In: *Ecosystem Health: New Goals for Environmental Management*. Costanza, R., Norton, B. G. and Haskell, B. D. (eds). Island Press, Washington D.C. pp 72-96. Cited Dover, S. R. and Handmer, J. W. 1995 op. cit.

[21] Smithon, M. 1989. *Ignorance and Uncertainty: Emerging Paradigms*. Springer-Verlag. New York. . Cited Dover, S. R. and Handmer, J. W. 1995 op. cit.

Appendix 4: Sources of Uncertainty[22]

Economic	*Ecological*	*Scientific*
• Uncertainties often exist about the ownership of, and access to, resources; • there are potential spillovers from other activities; • natural resource investments tend to be long term investments • natural resource commodity prices fluctuate more and are more difficult to forecast than other commodity prices; • most resource commodities are at greater risk of being replaced by cheaper substitutes developed by cheaper but unpredictable technological change.	• Ecosystems exhibit a high degree of complexity in structure and function; • ecosystems frequently exhibit both hidden resilience and threshold responses; • there are often significant time lags between an event and its effects; • effects are often cumulative and synergistic; • ecological relationships are spatially and temporally contingent and not homogeneous.	• An inability to conduct well-designed field experiments and long-term studies at all scales of study; • uncertainties in the statistical analyses used in environmental studies; • complications arising from the extrapolation of laboratory studies to the real world; • low statistical power of many epidemiological & laboratory studies. • limited predictive ability of natural and physical • an inability to verify and validate predictive models

[22] see Ministry for the Environment's Comparative Risk Assessment Scoping Study Working Paper No. 2 - Uncertaity and Environmental Policy Development: A critical Conspectus.