

The Nature of Habitat

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The protection of significant habitats of indigenous fauna is a matter recognised by the Resource Management Act 1991 as one of national importance. The aim of this article is to investigate the nature of the term habitat as applied by the RMA. The context of the enquiry is the natural and physical environment of New Zealand, with a particular focus on habitats of avian fauna. A central question raised by the research is whether or not air space used by birds can be considered habitat in terms of s 6(c) of the RMA. This issue is of contemporary importance, due to the advent of wind farms to the New Zealand environment. The compass of the term habitat has yet to receive full scrutiny by New Zealand courts and it is timely to give consideration to the nature of habitat. International approaches to habitat are also examined. The article concludes that where a regime such as the RMA prioritises habitat protection as a national goal, a lesser result for indigenous avian species will be achieved if areas of air space expertly identified as significant to the survival of the species cannot be defined as constituting significant habitat within the meaning of s 6(c).

1. INTRODUCTION

The concept of habitat is routinely applied in modern science to define the location or home of an organism. More recently, the concept has been tied to states' objectives to construct legal protection for species inhabiting a particular

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area. These attempts have been driven by global awareness of the impact of humans on biodiversity and a concomitant understanding that habitat protection can prevent or halt species loss. The term *habitat* is widely applied, but uncertainty exists as to the exact parameters of the expression. In New Zealand, this issue is of contemporary importance, due to the advent of the messiah for renewable energy, the wind turbine.

As a result of environmental damage produced by traditional energy sources such as fossil fuels, wind energy has been acclaimed as a less damaging alternative. In New Zealand, it is viewed as a potential contributor to attaining the country's obligations in terms of the Kyoto Protocol.¹ Clearly, it is a valuable technology offering benefits in terms of reduced externalities.² Globally, the profile of wind energy has risen rapidly, with states scrambling to plan and introduce large-scale wind farms. In Europe, landscapes have rapidly assimilated this newfound technology, such that land capacity has been saturated in places and attention has turned to the vast oceanic resource. This wave of windmills is touted as a sensible partial remedy to the environmental depredation created by human consumption.

Yet it is a rare thing that is a panacea for all ills. Human modification of the environment brings change, in the form of positive and adverse effects, both great and small. In terms of adverse effects, wind farms are equated, amongst other things, with impact upon visual amenities, noise, vibration, and damage to birds and other species.³ It is the impact upon birds that is the focus of this paper, and the extent to which habitat protection required by s 6(c) of the Resource Management Act 1991 ("the RMA"), can apply to birds on the wing.

2. BIRDS AND TURBINES

Drewitt and Langston⁴ document the impact of wind farms on birds and explore the methods by which potential impacts of a development may be assessed. The impacts identified include collision mortality, displacement due to disturbance, barrier effect, and habitat change and loss.

1 D Grinlinton, "Is wind power the answer to New Zealand's energy needs?" (2005) 6(7) *RMB* 71–73.

2 I Sagemüller, "Legislative and Policy Regime Governing the Generation of Wind Energy in New Zealand" (2006) 24(2) *JERL*.

3 M Ashby, "Wind's up – Planning the Future Now", 2004 <<http://www.windenergy.org.nz/documents/2004/040920-WindsUpFinal.pdf>> (accessed November 2006); A L Drewitt & R H W Langston, "Assessing the impacts of wind farms on birds" (2006) in *Wind, Fire and Water: Renewable Energy and Birds*, *Ibis* 148 (Suppl 1): 29–32; V Sutton & N Tomich, "Harnessing Wind is Not (by Nature) Environmentally Friendly" (2005) 22 *Pace Env'tl L Rev* 91.

4 *Ibid.*

2.1 Collision Mortality

Ample evidence exists to confirm that birds die when wind turbines are constructed. The scale of mortality correlates to factors such as climatic conditions and siting, in terms of flight routes and patterns. Drewitt and Langston accept that many wind farms will only result in low levels of bird mortality, but caution that for some species even limited impact could have significant effects on population levels. It is also accepted elsewhere⁵ that other aspects of the physical environment such as cell-phone towers, electric wires, windows, and motor vehicles cause significant bird mortality.

2.2 Displacement

The construction and operation of wind turbines significantly modifies the environment by introducing large metal structures, which create physical obstacles, noise, movement, and vibration. In addition, construction and maintenance bring increased levels of human activity and machinery to the vicinity. Drewitt and Langston⁶ document that birds may be displaced from areas within and surrounding wind farms due to visual intrusion and disturbance. They conclude that this displacement can amount effectively to habitat loss. The authors accept that the scale of the displacement may vary greatly, dependent upon factors including seasonal bird patterns, location of turbines with respect to important habitats, and availability of alternative habitats.

2.3 Barrier Effect

The physical obstacle created by turbines may also act as a barrier to birds on a flight path. Drewitt and Langston⁷ conclude that birds may alter their flight path to avoid a wind farm. This effect has been noted in relation both to migratory routes and daily movements on the home range, whereby birds fly to and from preferred feeding and roosting areas.⁸ These forms of displacement may result in birds expending additional energy and being deprived of preferred feeding distribution, which can result in effective habitat loss in the vicinity of turbines.⁹

5 See for example R Abramson, "Comment: The Migratory Bird Treaty Act's Limited Wingspan and Alternatives to the Statute: Protecting the Ecosystem without Crippling Communication Tower Development" (2000) 12 *Fordham Envtl Law J* 253 and Sutton & Tomich, *supra* note 3, at 3.

6 *Supra* note 3, at 32.

7 *Ibid*, at 33.

8 Sutton & Tomich, *supra* note 3, at 3.

9 A D Fox, M Desholm, J Kahlert, T K Christensen & I B Krag Petersen, "Information needs

2.4 Habitat Change and Loss

The placement of wind turbines on land or on the sea bed/column, occupies space that may formerly have hosted a variety of bird activity. Drewitt and Langston¹⁰ suggest that the scale of direct habitat loss resulting from the construction of a wind farm will depend on the scale of the development. Referring to the studies undertaken by Fox et al,¹¹ they conclude that actual habitat loss amounts to 2–5 per cent of the total development area.

In summary, recent literature related to the impacts of wind farms identifies that wind farm development can cause habitat loss. The literature distinguishes between actual or direct habitat loss and effective habitat loss. This is useful in terms of invoking the protection of s 6(c) of the RMA. However, the issue of whether effective habitat loss is equivalent to habitat loss for the purposes of s 6(c) RMA has yet to be considered by the courts. In addition, the matter of whether or not the air space itself can be termed habitat is not directly addressed by the literature, although some of the commentary appears to operate on the assumption that it can be. The balance of this article will focus on these related matters.

3. THE RMA

3.1 Introduction

The RMA is the principal statutory means of managing natural and physical resources in New Zealand. The Act creates a framework designed to promote the sustainable management of resources, and offers a range of measures that, in general terms, may afford protection to birds and the areas that they inhabit. The operation of s 5 of the Act, which defines the purpose, requires that resources be sustained for future generations, life-supporting capacity of resources be safeguarded, and adverse effects of activities on the environment be avoided, remedied or mitigated. All resource management plans created pursuant to the Act and all resource consents issued must meet this statutory purpose.

3.2 Section 6 Matters of National Importance

In addition, the Act identifies a range of other matters of which decision-makers and functionaries must be cognisant. Section 6 defines matters of

to support environmental impact assessments of the effects of European marine offshore wind farms on birds" (2006) in *Wind, Fire and Water: Renewable Energy and Birds*, Ibis 148 (Suppl 1): 129, at 136.

¹⁰ Supra note 3, at 34.

¹¹ Supra note 9.

national importance which decision-makers must recognise and provide for and includes:

- (c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna

Accordingly, when decisions are made relating to resource management plans and resource consents, it is incumbent upon the decision-maker to ensure that significant habitats of indigenous fauna are protected in terms of s 6. The term *habitat* is not defined by the RMA and the matter of definition has not, to the knowledge of the author, been directly addressed by the courts. Protection of habitat is routinely considered in resource consent decisions, where there is potential for environmental modification to adversely affect any given population of indigenous fauna. Hector's dolphin,¹² the brown teal duck,¹³ a gannet colony,¹⁴ and most recently the spotted kiwi and the endangered *Powelliphanta* "patrickensis"¹⁵ and "augustus"¹⁶ snails are amongst the species which have received judicial consideration. In none of these decisions, however, was there any substantive dispute in relation to the definition of habitat, or as to whether the area in question constituted habitat for the fauna affected. The issues more commonly addressed were the extent to which the development in question impacted upon the specific habitat, and whether adverse effects on the populations could be avoided, remedied or mitigated.

Growing concern about the impact of wind farms upon birds is likely to necessitate consideration of the definition of habitat. Significant habitats of indigenous fauna and flora are given elevated status, as matters of national importance to be recognised and provided for by virtue of s 6(c). If, on the facts, an activity is found to interfere with a significant habitat of a bird species, then this section is a primary means of securing protection of that habitat. It is accepted that s 6 is accessory to the principal purpose of the Act, and in some situations may be subordinated to the promotion of sustainable management of natural and physical resources.¹⁷ Any decision will then turn largely upon whether the adverse effects of the activity in question could be adequately avoided, remedied or mitigated.

12 *Clifford Bay Marine Farms Ltd v Marlborough DC*, unreported, Environment Court, 22 September 2003 (C131/2003).

13 *O'Shea v Auckland City Council* [2001] NZRMA 117.

14 *Gannet Beach Adventures Ltd v Hastings District Council* [2005] NZRMA 311.

15 *Royal Forest and Bird Protection Society of New Zealand v Buller District Council* [2006] NZRMA 193.

16 *Save Happy Valley Coalition Inc v Solid Energy New Zealand Ltd*, unreported, Environment Court, 14 December 2006 (C170/06).

17 *NZ Rail Ltd v Marlborough District Council* [1994] NZRMA 70, at 85, Greig J (HC).

3.3 Matters of Particular Regard

If a particular habitat of a bird remains unprotected pursuant to s 6, then it falls to be considered in the general run of other activities. Subsections 7(c), (d), (f), and (g) offer varying degrees of protection. Although these sections are useful, in that decision-makers must have particular regard to matters such as intrinsic values of ecosystems, amenity values, and the quality of the environment, they are not specific or directive in terms of providing protection of birds or areas where birds are active.

As a result of a recent amendment to the RMA, additional matters have been added to s 7. Subsections 7(i) and (j) provide that all persons exercising functions and duties under the Act must have particular regard to:

- (i) the effects of climate change:
- (j) the benefits to be derived from the use and development of renewable energy.

In this way, renewable energy developments, such as wind farms, are given heightened and specific statutory recognition. The reasons for this change can be traced to New Zealand's commitments to the Kyoto Protocol and related efforts made by central government to achieve improved climate control. The effects of climate change and renewable energy generation are key issues for New Zealand. The benefits of renewable energy are multiple and well documented.¹⁸

However, these changes are not without implication. When s 7 matters compete amongst themselves, no particular hierarchy applies and a decision-maker must weigh all competing considerations to best achieve the single purpose of the Act.¹⁹ Accordingly, where a species, or an area frequented by a species, does not qualify for protection under s 6(c), protection of birds and habitat will merely be one of the considerations a decision-maker must weigh under s 7.

3.4 Extent of Protection

When considering the extent of protection provided for avian fauna under the RMA, it is clear that legislators intended to provide distinct protection for the significant habitats of indigenous fauna and flora, and identified this as a matter of national importance. These intentions can be linked, amongst other things,

18 For further elucidation refer to *Genesis Power Ltd v Franklin DC* [2005] NZRMA 541, paras 15–66.

19 *Ibid*, para 59.

to a concern long held by New Zealand legislators and the public that native bird life was diminishing at a disquieting rate.²⁰ Coupled with this concern was a developing understanding that protection of areas inhabited by birds, in addition to mere species protection, should provide birds with a greater chance of survival. Accordingly, the RMA provides for habitat protection which complements and enhances specific animal protection and sanctuary/refuge provision provided by the Wildlife Act 1953 and the Marine Mammals Protection Act 1978.

The protection contemplated by the RMA must in no small way be directed at avian fauna, given that this faunal group (with reptiles), comprises the majority of New Zealand's land and freshwater vertebrates.²¹ To limit the concept of habitat to terrestrial and aquatic areas significantly reduces the ambit of protection provided by the RMA for birds. Interestingly, such limitation could also have potential implications in terms of protection of species partially and absolutely protected under the Wildlife Act. The decision of *Royal Forest and Bird Protection Society v Minister of Conservation*²² established that habitat destruction resulting in incidental killing may equate to a breach of the Act, as constituting hunting or killing as defined by s 2 of the Act.²³

3.5 Habitat Definition

The RMA provides no definition of the term *habitat*. In these circumstances, s 5(1) of the Interpretation Act 1999 requires that the meaning of the enactment be ascertained from its text in the light of its purpose. Courts will therefore seek the plain and ordinary meaning of the term, ensuring that this definition accords with the purpose of the RMA.

The term *habitat* stems from the Latin *habitare*; to inhabit or dwell. It is the third person, singular, present tense of the verb. The term has the same origins as the words *habitation* and *inhabit*; words generally applied to describe living

20 P Star & L Lohead, "Children of the Burnt Bush; New Zealanders and the Indigenous Remnant, 1880–1930" in E Pawson and T Brooking (eds), *Environmental Histories of New Zealand* (2002), Oxford University Press, Melbourne, 121.

21 "The State of Our Biodiversity" 9.6 in *The State of New Zealand's Environment* (1997), Ministry for the Environment, Wellington. The report documents that land and shore birds have suffered significant decline and extinction, and that damage to habitat is the main threat to most species.

22 [2006] NZAR 265, at paras 21–22.

23 For further discussion see T Crossen, "Should Snails Have Standing? – Towards an Endangered Species Act for New Zealand" (2007) *RMJ* 12. This article notes that the decision is under appeal. Similar issues have been of significant debate in the United States; see for example S G Davison, "The Aftermath of Sweet Home Chapter: Modification of Wildlife Habitat as a Prohibited Taking in Violation of the Endangered Species Act" (2003) 27 *Wm & Mary Env't L & Pol'y Rev* 541 and Sutton & Tomich, *supra* note 3, at 10.

conditions/dwelling places and the act of living in that area. Textual references dating back to the mid 18th century reveal application of the term *habitat* to describe a place where a plant naturally grows or occurs.²⁴ However, the term is clearly not limited to plants. The Oxford English Dictionary Online defines *habitat* as:²⁵

a. Nat. Hist. The locality in which a plant or animal naturally grows or lives; habitation. Sometimes applied to the geographical area over which it extends, or the special locality to which it is confined; sometimes restricted to the particular station or spot in which a specimen is found; but chiefly used to indicate the kind of locality, as the sea-shore, rocky cliffs, chalk hills, or the like.

This definition identifies that common usage of the word is fluid, and may cover a range of conditions dependent upon usage. The Oxford Dictionary of English²⁶ contains a more concise, but potentially broader, definition:

habitat noun

the natural home or environment of an animal, plant, or other organism: wild chimps in their natural habitat.

This definition includes the term *environment*, and thus could encompass all biotic and abiotic factors in any given area. The RMA definition of the term *environment* has a wide compass:

“**Environment**” includes —

- (a) Ecosystems and their constituent parts, including people and communities; and
- (b) All natural and physical resources; and
- (c) Amenity values; and
- (d) The social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) of this definition or which are affected by those matters:

The Encyclopaedia Britannica²⁷ also takes a broad approach, defining *habitat* thus:

24 The Oxford English Dictionary Online, Oxford University Press, 2006, 2nd edition 1989, <<http://dictionary.oed.com.ezproxy.waikato.ac.nz:2048/entrance.dtl>> (access date 12 December 2006).

25 Ibid.

26 The Oxford Dictionary of English, Oxford University Press, 2005 (2nd edition revised) in English Dictionaries & Thesauruses <<http://www.oxfordreference.com.ezproxy.waikato.ac.nz:2048>> (access date 12 December 2006).

27 Encyclopaedia Britannica Online, 2006 <<http://search.eb.com/eb/article-9038703>> (access date 13 December 2006).

habitat place where an organism or a community of organisms lives, including all living and non-living factors or conditions of the surrounding environment. A host organism inhabited by parasites is as much a habitat as a terrestrial place such as a grove of trees or an aquatic locality such as a small pond. The smallest topographic unit of a habitat with a characteristic uniformity of plant and animal species and environmental conditions, such as a sandy beach, is called a biotope. Microhabitat is a term for the conditions and organisms in the immediate vicinity of a plant or animal.

The latter definition includes all living and non-living factors or conditions of the surrounding environment. Applying this definition, it would be difficult to exclude air from the habitat of a bird, or of many other creatures.

However, an alternative argument exists that factors such as air and sunlight could merely be conditions which relate to a discrete terrestrial- or aquatic-based habitat. Taking this view, it would be possible to limit habitat to that area of land or water where organisms walk, run, hop, slither, or swim. But this definition is against the weight of those which include all environmental factors. Air is necessary for the survival of creatures, in many cases simply to breathe. If the air surrounding a terrestrial habitat is so foully polluted as to threaten a species, then surely the habitat is likewise damaged?

In relation to birds, this issue takes on even greater import. Most birds fly to survive. In New Zealand, flightless birds suffered the earliest and most dramatic extinctions and species loss. Use of air space by flight offers birds access to food sources, breeding and nesting places, and a means of escape from predators and other threats. Humans also use the air around them to breathe, and live in, the one difference being that, more often than not, their feet do not leave the ground. Given that the air around us is so inextricably bound to survival, it would appear illogical to exclude it from a definition of habitat.

The sense of this conclusion is supported by the RMA definition of land. Section 2 defines land as follows:

“Land” includes land covered by water and the air space above land:

Accordingly, it is arguable that where a resource management plan, a resource consent, or a judicial or other administrative decision defines an area of land as significant habitat, it follows that the air space above it is included in the definition. The difficulty arises where avian activity in an area occurs only in the air, and is not directly related to the land or water below it. This would be common for many flight paths of birds, where the air route is a connection between nesting, feeding, or breeding areas. Yet these air routes could be used on a regular basis, so that they are essential to the survival of the species. To protect only the terrestrial or aquatic areas fails to recognise basic prerequisites of avian

life. It also fails to take account of the interconnectedness of the environment. Including these areas within the definition of habitat would provide a holistic and more comprehensive approach to protection of indigenous fauna.

This does not mean that all the air space used in flight would automatically acquire the protection of a section such as s 6(c) of the RMA. It would be incumbent upon anyone seeking to invoke the protection of this subsection to prove that the air space was a *significant* habitat of indigenous fauna, in a manner similar to the approach to a significant terrestrial or aquatic habitat. In this way, rather than relating to a bird straying into the area, an essential or important pattern of use would need to be substantiated. Furthermore, evidence of the extent of potential disturbance and/or displacement of the relevant population would be required to support a claim for protection of the habitat. Automatic full protection is not guaranteed under the RMA. The scale and character of the impacts and the nature of the proposal would require careful assessment. In applying s 5 it has been accepted by the Environment Court that all adverse effects do not require avoiding and remedying; in some circumstances, mere mitigation of adverse effects will suffice.²⁸

The approach of the Environment Court in relation to the habitat of the dusky dolphin is instructive. In *Friends of Nelson Haven v Tasman Bay v Marlborough DC*²⁹ the Court found that the whole of Admiralty Bay and an associated basin constituted significant habitat for the dusky dolphin. The habitat extended over an area of nearly 14,000 ha; the inner Bay has a surface area of approximately 2750 ha, the outer Bay approximately 8940 ha, and the Current Basin approximately 2120 ha. Judge Thompson stated:

Admiralty Bay (and the Current Basin) is a *significant* habitat for the 1000 plus dusky dolphins which go there, particularly over winter. Nobody really disputes that either. If a habitat is *significant*, then no other qualifying characteristic is required. It is not, for instance, necessary that the type of habitat be limited in extent locally, regionally, or nationally, nor that the species for which it is significant is threatened or even uncommon.

Aquatic species such as dolphin range widely in the ocean to survive and flourish. In this case there was little dispute as to whether the area constituted habitat; the dolphins were regularly seen in the area on a seasonal basis, and expert evidence confirmed the whole area as significant habitat.

Simply because the area was deemed significant habitat did not, however, entail that the area was shrouded in blanket protection. This case related to

²⁸ *Trio Holdings v Marlborough District Council* [1997] NZRMA 97.

²⁹ Unreported, Environment Court, 16 May 2006 (W036/06), Thompson J. This decision referred extensively to an earlier and related decision: *Kuku Mara Partnership v Marlborough District Council*, unreported, Environment Court (W37/2005).

consents for aquacultural activities, and the appeals focused on habitat exclusion. A central issue was whether additional marine farms in the area would have the impact of excluding the dolphins from the habitat. In relation to the existing farms in the area the Court held:

The existing marine farms in the Bay have displaced the dolphins from that area of habitat, at least for feeding purposes, but that displacement has not, so far as can be measured (given that there were no *pre-farm* population studies), resulted in any harm to the population. The habitat provided by the Bay as a whole remains viable.

In this way, the scale, character, and intensity of the proposed activity becomes relevant in terms of the impact upon the indigenous species and the related viability of habitat.

3.6 Flight Paths and Corridors

It has been established that habitat can embrace large areas frequented by the inhabitants and, relying upon the RMA definition of land, may also embrace the air space above the land and water. The issue of whether routes, passageways or corridors are necessarily part of habitat was not considered in *Friends of Nelson Haven*, due in all probability to the fact that the evidence established common ground that Admiralty Bay was an important habitat for dusky dolphins, and that the dolphins had adopted a unique feeding ecology in the Bay. Clearly, in relation to birds it would be necessary to ascertain the nature of the movements in flight, and the areas covered or routes traversed, in order to assess how the birds were using the air space. If the air space was in common use for foraging and general life activity, it would be difficult to distinguish those activities from that of the dolphin, particularly where it was directly above land or water used by the birds. An argument can be made, however, to distinguish this type of air space use from connectors, corridors or migration routes travelled by animals. It could be argued that these areas are disconnected from breeding and feeding spaces and as such are different to habitat and should not acquire protection.

The New Zealand Coastal Policy Statement 1994 (“the NZCPS”) provides central government policy direction in relation to the coastal environment managed under the RMA. In Policy 1.1.2(b)(ii) the NZCPS differentiates between *habitat* and *ecological corridors linking habitat patches*. It provides (my emphasis):

Policy 1.1.2

It is a national priority for the preservation of the natural character of the coastal environment to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna in that environment by:

- (a) avoiding any actual or potential adverse effects of activities on the following areas or habitats:
 - (i) areas and habitats important to the continued survival of any indigenous species; and
 - (ii) areas containing nationally vulnerable species or nationally outstanding examples of indigenous community types;
- (b) avoiding or remedying any actual or potential adverse effects of activities on the following areas:
 - (i) outstanding or rare indigenous community types within an ecological region or ecological district;
 - (ii) *habitat important to regionally endangered or nationally rare species and ecological corridors connecting such areas*; and
 - (iii) areas important to migratory species, and to vulnerable stages of common indigenous species, in particular wetlands and estuaries;

The NZCPS contains no definitions of the relevant terms, but in relation to the coastal environment the NZCPS amplifies Part 2 of the RMA by detailing how the purpose and related national priorities can be achieved. Despite the differentiation between *habitat* and *corridor*, the intent of the NZCPS is to ensure protection of both in relation to regionally endangered or nationally rare species. The NZCPS contemplates that protection of habitats *and* corridors is necessary in order to secure the national priorities.

As it is incumbent upon local authorities to give *effect* to the NZCPS, resource management plans prepared under the RMA which fail to protect such habitat and corridors potentially fail to comply with the requirements of the Act. The impact of the NZCPS means that in relation to the coastal environment and classified species any differentiation between *ecological corridor* and *habitat* is academic, as the NZCPS requires protection of each. In addition, the NZCPS extends protection for all indigenous species by requiring protection of *areas* in addition to habitat, where those areas are important to the continued survival of the species. In this way, where evidence can be adduced that a flight path or area of sky is of consequence to the survival of a species, a *prima facie* case for protection of that area will be supported by the provisions of the NZCPS.

Not only does the NZCPS recognise the need to protect ecological corridors, habitat, and important areas, it also prioritises protection of the *natural movement of biota* with a view to preserving natural character through protecting the integrity, functioning, and resilience of the coastal environment.³⁰ Most birds predominantly rely upon air space to support movement for feeding, breeding, and migratory imperatives. Compromising air space by significant alternative resource use is the most obvious way of impeding that natural movement. In

30 NZCPS Policy 1.1.4.b.

order to give effect to Policy 1.1.4(b), developing measures designed to ensure natural movement of avian biota would necessitate consideration of protection of air space supporting that movement.

By virtue of the RMA, the NZCPS is the sole mandatory instance of a national policy statement. The reach of the NZCPS is limited to the coastal environment; the need to protect this special area recognised as a matter of national importance by s 6(a) RMA. A similar national imperative applies universally to the significant habitats of indigenous fauna by virtue of s 6(c). However, due to the NZCPS, species in the coastal environment receive more explicit policy attention, which in turn must be translated into regulatory measures designed to give effect to the policy. It may be that in New Zealand the coastal environment can be singled out as requiring special protection as provided for in the RMA. Nevertheless, it has become increasingly obvious that New Zealand is suffering a biodiversity crisis and s 6(c) is aimed at halting this. Recognition of air space as potential significant habitat is one way of enabling universal adoption of an approach similar to the NZCPS position, whereby areas important to the survival of a species can be protected.

3.7 An Alternative Approach to Defining Habitat and Corridors

A brief review of international literature reveals ongoing discourse relating to habitat parameters and corridors.³¹

Historically, scientists have tended to assess habitat relying on vegetation type/biotope attributes. The definitions have been allied to the concepts of patch and matrix, in which the patch is the unit of distribution of an organism and differs in appearance (i.e. vegetation type) from its surroundings.³² Recent writings criticise this approach on the basis that it is simplistic and fails to properly understand and protect all necessary elements of an animal's life cycle. Hagan and Hodges comment:³³

The standard habitat assessment approach links attributes of the climate, soil, or vegetation to population size or relative use (Hall et al. 1997). This linkage has

31 R L H Dennis, T G Shreeve & H Van Dyck, "Habitats and resources: the need for a resource-based definition to conserve butterflies" (2006), 15 *Biodiversity and Conservation* 1943–1966; J Fischer, D B Lindenmayer & I Fazey, "Appreciating Ecological Complexity: Habitat Contours as a Conceptual Landscape Model" (2004), 18(5) *Conservation Biology* 1245; P Beier & R Noss, "Do Habitat Corridors Provide Connectivity?" (1998), 12(6) *Conservation Biology* 1241; and L M Puth & K A Wilson, "Boundaries and Corridors as a Continuum of Ecological Flow Control: Lessons from Rivers and Streams" (2001), 15(1) *Conservation Biology* 21.

32 For discussion of historical approach see Dennis et al, *ibid*, at 1943.

33 A N Hagen & K E Hodges, "Resolving Critical Habitat Designation Failures: Reconciling Law, Policy, and Biology" (2006) 20(2) *Conservation Biology* 403.

two major problems. First, it ignores how habitat elements provide resources for the species and how different elements affect survival and reproduction (Morrison 2001). When similar structures offer different abundances of resources, structure alone is insufficient for determining the area's usefulness to a species. Thus areas that are similar based on vegetative measurements (e.g., tree density or stand composition) may have large variation in populations and vital rates of species as a result of variation in a key resource that is not captured by the vegetative attributes.

Removing the air space as an element of habitat when considering protection of avian species overlooks the imperative of the air resource to the continued survival of the species. Isolating and differentiating the use of the air space by birds into areas as mere passageways or as foraging/life cycle habitat is also fraught with difficulty. A more holistic approach is to adopt a resource-based definition for the concept of habitat and this is what the NZCPS in effect does by enabling protection of corridors. Dennis et al discuss the application of a resource-based definition to butterflies in these terms:³⁴

A resource-based definition of habitat

In all empirical and theoretical population studies habitat is implicitly or explicitly a bounded space (e.g., den Boer and Reddingius 1996; Hanski and Gilpin 1997). The fundamental problem with this is that it is often unclear what this space comprises and, where arbitrary decisions have been made about the space, for instance based on hostplant patches, what is missing. Previously, we have shown that as habitat is necessarily the location where an organism lives out its life cycle it follows that it should be possible to map the bounds of a habitat in terms of life history requirements (Dennis and Shreeve 1996; Dennis et al. 2003). The approach we take is to regard species as requiring a set of resources and conditions in order to function; a convenient way of categorizing such resources for arthropods is under each stage of the life cycle. For example, an adult butterfly would minimally require resources for egg laying, mate location, resting, roosting, feeding and predator escape. Other stages can be treated similarly and the resources mapped. The habitat is then the logical extension of this reasoning, defined by the intersection and union of these resources (Dennis and Shreeve 1996), the links being made by flights of adults and movements of larvae. The resources required by each stage may be visualized as belonging to two groups, consumables (e.g. hostplant parts, adult food) and utilities. The latter describe the conditions for existence and persistence, such as physical sites for various activities (e.g., mate location

34 *Supra* note 31, at 1948.

and pupation sites), and suitable conditions for development and activities (i.e. suitable local climates and microclimates) and enemy-free space. It is this latter group of resources, well appreciated in bird and mammal ecology (e.g., Lindenmayer 2000), that is so often ignored in habitat definition of butterflies and other arthropods. A functional definition of habitat is thus a practical solution to Hutchinson's concept of a hyperdimensional niche (Whittaker et al. 1973); habitat describes real ground conditions (e.g., occupied space) whereas niche formulates biological space (vectors of influential agents).

Applying a resource-based definition of habitat would in this way capture all space occupied by a species in order to carry out its life cycle. Such a definition complements the NZCPS approach of recognising and protecting *areas* important to species. Although broader than a biotope/vegetation classification approach, it should be emphasised that any application of such a concept to habitat protection under the RMA would be tempered by the s 6(c) qualification of *significance*.

3.8 Migration Routes

The flight paths of migratory birds are on a larger scale. Although these flight paths may not be vital to daily life, they constitute a fundamental component of the life cycle of these birds, a natural element of existence which has occurred since time immemorial. Scientific experts, through the use of modern technology, are now capable of tracking the extraordinary flight patterns of migratory birds. Recent research in relation to sooty shearwaters (*Puffinus griseus*) established that populations of these birds conduct a trans-equatorial pan-Pacific flight in a figure-of-eight pattern as they move between their summer and winter destinations.³⁵

Applying a resource-based definition of habitat, it could be argued that a migration route is simply an extended corridor or connection. The difficulty that arises in terms of protection of this route is that generally migration is tied to the concept of nation. Therefore any such route extends beyond national boundaries and hence beyond the reach of domestic legislation such as the RMA. If, however, part of a migration route used national space, additional protection could be afforded through domestic legislation. In resolving these issues it is instructive to look beyond the RMA to consider protection of habitat and flight paths elsewhere.

35 S A Shaffer, Y Tremblay, H Weimerskirch, D Scott, D R Thompson, P M Sagar, H Moller, G A Taylor, D G Foley, B A Block & D P Costa, "Migratory shearwaters integrate oceanic resources across the Pacific Ocean in an endless summer" (2006) 103(34) *PNAS* 12799–12802.

4. BEYOND THE RMA

4.1 Protection of Habitat in New Zealand and Internationally

Protecting habitat is generally viewed as an improvement upon the more limited species protection approach. It is commonly recognised that a protected species in a defiled habitat is less likely to flourish than one in a pristine habitat. Yet protection of habitat has limitations. Water, air, sediment, wind, and dust move freely, without recognition of national boundaries, when not harnessed by a human hand. So too do many creatures. Birds range far and wide, interacting in a range of ecosystems and places. Tying protection to a discrete habitat may result in important ecological considerations being neglected.³⁶ For some time, attempts have been made to reconcile legal protection afforded by states with the interconnectedness of the environment. This not only includes broader, environmental-based methods of biodiversity conservation but also involves, if not a global, a trans-national approach.

4.2 Convention on Biological Diversity

The Convention on Biological Diversity (“the CBD”) promotes, as one of its three main aims, the conservation of biological diversity for its intrinsic value. Article 8 of the CBD provides *inter alia*:³⁷

Article 8. In-situ Conservation

Each Contracting Party shall, as far as possible and as appropriate:

- (a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (b) Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (c) Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;

36 For examination of this topic as it relates to the life of the honey buzzard (*Pernis apivorus*) see J Ebbesson, “Lex Pernis Apivorus: An Experiment of Environmental Law Methodology” (2003) 15(2) *Journal of Environmental Law* 153.

37 The Convention on Biological Diversity, which came into force in 1994, has now been ratified by 190 parties <<http://www.biodiv.org/convention/convention.shtml>> (access date 17 December 2006).

(d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;

The CBD requires contracting parties to create environmental conditions which positively influence the conservation of biological diversity. The Convention promotes the creation of protected areas, the development of management plans for those areas, rehabilitation of degraded areas, and the management of other species which may threaten protected areas and species. The focus of the Convention is holistic and concerns itself not only with species protection, but also with the protection of ecosystems, habitats, and biological diversity per se. *Habitat* is defined by the CBD as:

“**Habitat**” means the place or type of site where an organism or population naturally occurs.

The Convention also defines *ecosystem* and *in-situ conservation* as follows:

“**Ecosystem**” means a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

“**In-situ conservation**” means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

4.3 New Zealand Biodiversity Strategy

New Zealand responded to its obligations under the CBD by preparing the New Zealand Biodiversity Strategy (“the Strategy”), recognising as a core goal particular responsibility for conserving our indigenous ecosystems and species. It provides:

Goal Three: Halt the decline in New Zealand’s indigenous biodiversity

Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats, and sustain the more modified ecosystems in production and urban environments; and do what else is necessary to

Maintain and restore viable populations of all indigenous species and subspecies across their natural range and maintain their genetic diversity.

The Strategy adopts a definition similar, but different, to that of the CBD as follows:

Habitat: The place or type of area in which an organism naturally occurs. See also Natural habitats and ecosystems.

This definition substitutes the word *area* for the term *site*, and this modification could potentially have significance for the reach of the expression *habitat*. Arguably, a *site* can be confined to land, whereas the word *area* has, in general terms, greater breadth of application. The *sky* could readily be termed an area, whereas the word *site* would have less ready application. Regardless of this issue, in all likelihood the term *place*, contained in both definitions, carries with it sufficient spatial connotations to embrace air and sky.

The Strategy also contains a definition of *ecosystem* which expressly refers to the air as follows:

Ecosystem: An interacting system of living and non-living parts such as sunlight, air, water, minerals and nutrients. Ecosystems can be small and short-lived, for example, water-filled tree holes or rotting logs on a forest floor, or large and long-lived such as forests or lakes.

Although this definition contains specific reference to air, it does not necessarily follow that lack of such specificity in the definition of *habitat* implies exclusion of the air resource. The term *ecosystem* is used to describe a system, whereas the term *habitat* relates to place or area. Both are defined to include biotic and abiotic factors. A habitat may encompass several ecosystems, and conversely an ecosystem may support a range of biological communities and related habitats. Both are human-generated concepts,³⁸ the dynamic limits of which are subject to debate.

When considering the notion of habitat the natural enquiry is as to whether the particular organism “lives” in a given area. This enquiry is more readily answered in relation to organisms that survive in discrete areas. Ability to travel and range far and wide makes assessment of habitat a more difficult task. An organism’s movement brings with it the concepts of *territory*, *locality*, and *range*. These terms may relate to daily or seasonal feeding and breeding patterns, or more extensive migratory patterns. Whether the definition of habitat can extend to these concepts is a central concern of this paper. Should habitat be limited to a defined resting/nesting space or should it cover that area with which an organism habitually engages in order to supply life’s basic prerequisites? Is it necessary to create a distinction between daily/seasonal movement patterns and

38 F Bosselmann, “What law makers can learn from large scale ecology” (2002) 17(2) *J Land Use & Envtl Law* 207–324.

those more wide-ranging migratory patterns? Or should the entire range of an organism be included within the term *habitat* as merely a complete definition of the area where the organism naturally occurs?

An interesting comparison involves considering the habitat of humans. Arguably, much of this world can be considered the habitat of humanity. Due to technological advances and modern transportation and construction methods, human beings naturally occur in most biotopes on this earth. (Although there is potential to argue that this occurrence is no longer natural.) As humans travel to and from places of work and endeavour, on holiday, and undertake recreational pursuits they interface with large areas and different geographical spaces. It seems artificial to suggest that the habitat of humans should be limited to their place of residence or address. Likewise, to do this to birds, which use flight as an intrinsic prerequisite to survival, tends to place unnatural limitations on the notions of home, space, and the meaning of “living”.

4.4 Convention on the Conservation of Migratory Species of Wild Animals

In order to examine these issues further it is necessary to investigate situations where a distinction is made between *habitat* and *range* or *territory*. New Zealand is a party to the Convention on the Conservation of Migratory Species of Wild Animals (“the Convention”), which came into force in 2000. The intention of the Convention is to enable conservation of endangered migratory species. The Convention enables states to work together to afford protection to migratory routes which extend beyond a nation’s borders.

4.4.1 Migratory species

The Convention defines a migratory species as:

- a) “**Migratory species**” means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries;

This definition of migration is accordingly tied to the concept of nation. A migration generally occurs when the animal moves from one nation to another or others. It is a fundamental principle of the Convention, recorded in Article II, that the parties acknowledge the importance of migratory species being conserved and that necessary steps are taken to conserve the species and their habitat.

4.4.2 Habitat and range of migratory species

For the purposes of the Convention, habitat is defined as follows:

- g) “**Habitat**” means any area in the range of a migratory species which contains suitable living conditions for that species;

Whilst the following definition is provided for range:

- f) “**Range**” means all the areas of land or water that a migratory species inhabits, stays in temporarily, crosses or overflies at any time on its normal migration route;

On a complete reading of the Convention it is apparent that the term *habitat* is not intended to be used to describe flight paths of migratory birds, even though the definition of habitat refers to an area which contains “suitable living conditions”. The definition of range distinguishes between inhabiting an area, and staying temporarily etc. It is likely that when the definition of habitat was developed it was intended to capture resting areas where birds use the land, sea, and air to replenish themselves for the trip onwards. It would also include the ultimate destination of the migration. It can be argued that a non-foraging migratory flight path does not constitute suitable living conditions; however, in the author’s view, as an essential requirement in the bird’s life cycle this appears tenuous and restrictive.

In Article V, when dealing with conservation agreements, the Convention juxtaposes the terms range and migration route as follows:

4. Each AGREEMENT should:
- a) identify the migratory species covered;
 - b) describe the range and migration route of the migratory species;

The juxtaposition here, and in the definition of range, suggests that *range* is different to *route*, although the latter is undefined by the Convention. It is apparent that range is intended to define the limits of the bird’s activity in a spatial sense, and that route defines the actual path flown. In addition, Article V introduces the concept of a *network of habitats* as follows:

- f) maintenance of a network of suitable habitats appropriately disposed in relation to the migration routes;

Clause f) differentiates between *habitats* and *routes*, but introduces the notion of a *network*. The issue which remains unresolved is, where a network exists,

are the links or pathways creating the network part of habitat, or something different? In the context of the Convention, the distinction as to *habitat* and *route* or *range* is not particularly important as conservation measures, by virtue of the definition of conservation status, can be attached to both habitat and range (which includes route).

4.4.3 Purpose of the Convention and Conservation Agreements

The Convention may potentially exclude migration routes from the definition of habitat, but not with the intention of excluding protection for such routes. The purpose of the Convention is to conserve species and habitats. Pursuant to Article II(c) parties to the agreement must endeavour to conclude agreements covering the conservation and management of migratory species.

As a means of implementing the Convention, New Zealand is a party to several action plans including: *Action Plan ACAP — Agreement on the Conservation of Albatross and Petrels*. The Action Plan details a range of measures to protect and conserve the birds, including prohibiting trade and encouraging habitat conservation and restoration. Amongst other things, clause 2.3.2 requires that the parties to the plan seek to develop management plans for the most important *foraging and migratory habitats* of albatrosses and petrels. This definition contemplates that birds have distinct habitats used for foraging and also for migrating. It does not expressly answer the question of whether those habitats include the air space used. However, as most birds forage and migrate on the wing, it would seem difficult to attempt to exclude the air space from the definition of habitat. Indeed, some birds actively take their prey whilst airborne. It also follows that a bird may be disturbed from this foraging habitat by structures and/or activity on either land, water, or in the air column itself. An interesting comparison to make is with a migrating land animal. Would it be reasonable to suggest that as a wildebeest undertakes its seasonal migrational trek, that the land it annually treks over is not its habitat? Similarly, a migrating whale and its oceanic path?

In summary, the intent of the Convention is to provide supra-national protection of migratory species. Agreements are sought to prevent unnecessary loss of endangered species and to protect and restore related habitats. The issue of whether bird flight paths fall within the term *habitat* is not expressly dealt with. There is, however, potential to argue that migratory flight paths exist within the concept of range, a notion that extends beyond the limits of habitat. Despite this, the Convention extends protection to each concept.

4.5 The EU Habitats Directive

The Habitats Directive³⁹ (“the Directive”) is a directive which underpins the European Union approach to conservation of biodiversity. The Directive focuses on habitat protection as a prime means of halting species loss, but also provides for specific species protection measures. It builds upon the earlier Birds Directive⁴⁰ and enables the establishment and management of a network of protected areas, now designated under the ecological Natura 2000 Network.

4.5.1 The relation of environment to habitat in the context of the Directive

The Directive contains a definition of *natural habitats* as follows:

(b) **natural habitats** means terrestrial or aquatic areas distinguished by geographic, abiotic and biotic features, whether entirely natural or semi-natural;

A preliminary reading of this definition could lead a reader to assume that the specific reference to terrestrial and aquatic areas, by inference, excludes air from habitat. However, the latter part of the sentence qualifies the former, by relation to abiotic and biotic features. In addition, the Directive contains a definition of *habitat of a species* as follows:

(f) **habitat of a species** means an environment defined by specific abiotic and biotic factors, in which the species lives at any stage of its biological cycle;

This definition introduces the notion of *environment defined by specific abiotic and biotic factors*. Inclusion of the term *environment* supports an interpretation of habitat as including the air resource supporting a terrestrial or aquatic habitat. Yet the limits of that air resource are far from clear, particularly if avian species are supported by the habitat. Annex I of the Directive lists specific habitat types, each of which have terrestrial or aquatic features, and these habitat types have been further defined by subsequent European Commission publications.⁴¹

39 Council of the European Communities, “Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora” (*OJ L* 206, 22 July 1992) <<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML>> (access date 21 February 2007).

40 Council of the European Communities, “Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds of 2 April 1979” (*OJ L* 103, 25/04/1979) <<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31979L0409:EN:HTML>> (access date 21 February 2007).

41 For example, European Commission, “DG Environment Interpretation Manual Of European Union Habitats”, October 2003 <http://ec.europa.eu/environment/nature/nature_

The published descriptions of habitat do not refer to the air resource; however, related publications reveal assumptions and conclusions that the air supporting a habitat is an integral part of the habitat to be considered.

The rationale for such a conclusion can be traced back to Article 6(1) of the Directive which deals with habitat conservation measures and provides:

For special areas of conservation, Member States shall establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans, and appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the natural habitat types in Annex I and the species in Annex II present on the sites.

The Article introduces the concept of the *ecological requirements of a natural habitat type*. The Directive does not contain a definition of ecological requirements, but a guidance document published by the Commission in 2000 concluded:⁴²

Although the directive does not contain any definition of the “ecological requirements”, the purpose and context of Article 6(1) indicate that these involve all the ecological needs of abiotic and biotic factors necessary to ensure the favourable conservation status of the habitat types and species, including their relations with the environment (air, water, soil, vegetation, etc.). These requirements rest on scientific knowledge and can only be defined on a case-by-case basis, according to the natural habitat types of Annex I, the species of Annex II, as well as the sites which host them. Such knowledge is essential to make it possible to draw up the conservation measures, on a case-by-case basis.

It is eminently sensible that habitat protection encapsulate the environment supporting the habitat as required by the Directive. The definition of *habitat of a species* refers specifically to the environment. Although it could be argued that the *ecological requirements of a habitat* are different to *habitat per se*, this runs counter to the definition. The *ecological requirements of a habitat* must be the essential building blocks of that habitat. What is a habitat without air, water, soil, and/or vegetation? Removal of reference to these elements in

conservation/natura_2000_network/habitats_habitats_directive/interpretation_manual/pdf/interpretation_manual_en_oct_03.pdf> (access date 21 February 2007).

42 European Commission, “Managing Natura 2000 sites: The provisions of Article 6 of the ‘Habitats’ Directive” 92/43/EEC <http://ec.europa.eu/environment/nature/nature_conservation/eu_nature_legislation/specific_articles/art6/pdf/art6_en.pdf> (access date 21 February 2007).

relation to habitat definition renders the parameters of that notion essentially empty. These factors are fundamental to the continued existence of the habitat, and presumably as requirements, if removed, the habitat will fail. It also follows that if the requirements are compromised, but not removed, a habitat could potentially continue but in a lesser state.

4.5.2 Bird flight paths and conservation measures which correspond to ecological requirements

In establishing the necessary conservation measures to correspond to the ecological requirements of a given site, each situation would need rigorous assessment. That bird flight paths are contemplated by the Directive is supported by a guidance document prepared at the Commission's behest to provide methodological guidance on the provisions of Article 6.⁴³ The document specifically uses a wind farm and the impact on bird flight paths as an example of a project to be assessed in relation to the impacts it has on the integrity of the site. In the model assessment, the wind turbines were to be sited on a hill located near to a Natura 2000 site. The wind turbines were in the flight path of one of the site's major winter roost areas for an internationally important bird species. The potential effects identified in the assessment included habitat loss due to disturbance and bird mortality.

Having concluded that pursuant to the Directive the concept of habitat is inextricably bound to the ecological requirements of that habitat, in relation to bird flight paths, it becomes necessary to consider whether the air resource supporting the entire range of a bird can be considered as an ecological requirement of habitat, and part of its environment which it lives in at any stage of its life cycle.

4.5.3 The notion of range in the context of the Directive

The term *range* is undefined in the Directive, yet it falls to be considered in certain key areas. Natural habitat types of community interest are defined as follows:

- (c) **natural habitat types of Community interest** means those which, within the territory referred to in Article 2:
 - (i) are in danger of disappearance in their natural range;

43 European Commission 2000, "Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive" 92/43/EEC, November 2001 <http://ec.europa.eu/environment/nature/nature_conservation/eu_nature_legislation/specific_articles/art6/pdf/natura_2000_assess_en.pdf> (access date 21 February 2007).

or

(ii) have a small natural range following their regression or by reason of their intrinsically restricted area; ...

This definition infers that range is a characteristic of habitat, and further it infers that reduction in range threatens habitat. The definition of *favourable conservation status of a natural habitat* supports this inference:

(e) **conservation status of a natural habitat** means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2.

The conservative [sic] status of a natural habitat will be taken as “favourable” when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and ...

In addition, the term *range* is also applied to conservation of a species as follows:

(i) **conservation status of a species** means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2;

The conservation status will be taken as “favourable” when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis;

That the *term* range is used in more than one sense is recognised in the report prepared by the Working Group on Article 12 of the Directive, which defined *range* as *a dynamic concept which describes roughly the spatial limits within which a species occurs*.⁴⁴ The report noted that *range* is not identical to

44 European Union, “Contribution to the interpretation of the strict protection of species (Habitats Directive article 12): A report from the Article 12 Working Group under the

territories or localities where species permanently occur as many of these can be patchy and disjointed within a range. It also made reference to the fact that *natural range for a migratory species* will include areas of land or water that are not permanently occupied, such as all the areas that a migratory species inhabits, stays in temporarily, crosses or overflies at any time on its normal migration.⁴⁵

The issue which remains unresolved is whether, in this context, range can continue to be considered part of habitat. The report makes a distinction between *territory/locality* and *range*, but draws no such distinction between *range* and *habitat*. In the context of the Directive, we return to the question of whether these areas and their linkages form part of habitat as a whole. The fact that both can be defined as an *area where the species naturally occurs* lends support to an argument that range is a term used simply to signpost habitat. To exclude range from habitat produces the unusual result that when a bird is in flight it is no longer in an environment defined by specific abiotic and biotic factors, in which the species lives at any stage of its biological cycle.

The Directive deals with the issue of range and definition of protected habitat in Article 4(1) which provides inter alia (my emphasis):

On the basis of the criteria set out in Annex III (Stage 1) and relevant scientific information, each Member State shall propose a list of sites indicating which natural habitat types in Annex I and which species in Annex II that are native to its territory the sites host. *For animal species ranging over wide areas these sites shall correspond to the places within the natural range of such species which present the physical or biological factors essential to their life and reproduction. For aquatic species which range over wide areas, such sites will be proposed only where there is a clearly identifiable area representing the physical and biological factors essential to their life and reproduction.*

The inclusion of this section effectively limits habitat protection. Not all areas of the range are covered, just those which represent physical and biological factors essential to life and reproduction. The intent, no doubt, is to counter large areas which are not important to the survival of the species falling within the protection. There are strong policy reasons for supporting this limitation, including efficiency, effectiveness, and consideration of alternative resource users. Nevertheless, when considering the flight paths of birds for seasonal

Habitats committee with special focus on the protection of breeding and resting places (article 12.1.d)” <http://forum.europa.eu.int/Public/irc/env/species_protection/library?l=/final_report_working/final_article_wgpdf/_EN_1.0_&a=dApril 2006> (access date 21.02.07 at 24).

45 This definition is consistent with that of the Convention on the Conservation of Migratory Species of Wild Animals 2000, supra at para 4.4 at 28.

feeding, breeding, and migratory purposes, it is difficult to conceive of these activities as less than essential to bird life and reproduction. In order to afford protection consistent with Article 4(1), expert ornithological evidence establishing essential flight paths and patterns would be required.

In summary, it can be argued that air space used by birds for general life purposes falls within the definitions of habitat provided by the Directive, which encompass environment. Certainly, air space is specifically contemplated as requiring protection by supporting Commission documents.

The difficult issue to resolve is whether a flight path falling within the definition of *range* can thus be excluded from *habitat*. This issue is not particularly important within the context of the Directive because *range* is a factor to be considered in *conservation status*, and thus reduction of range can itself trigger conservation protective measures. However, where a regime creates protection tied to habitat alone, this distinction takes on greater import. If a structure or an activity impedes a flight path, can this be said to be disturbance of habitat? To argue that it is a reduction in range alone would be riddled with difficulties. *Range* is the term used to describe the spatial limits of an animal's activities. If a structure is in the middle of the range, and birds fly around the structure, can this be said to be a reduction in range? The more appropriate conclusion must be that it constitutes habitat disturbance. How can this situation be any different from an elephant being obstructed by an activity from obtaining access to a seasonal waterhole? Mapping and defining flight paths by way of expert evidence will counter concerns about blanket protection of resources. Rather than removing flight paths from consideration in relation to habitat protection, the better approach is to consider specific protective measures assisted by expert evidence.

The EU Directive underpins the European Union approach to conservation of biodiversity. Protection of habitat is a key concern in terms of attaining conservation goals. A brief examination of jurisdictions beyond the Union reveals that the protection of habitat persists as a determinative factor in securing conservation objectives.

4.6 Canada

The Species at Risk Act 2002 carries the following definition of habitat which, interestingly, in relation to aquatic species, considers a migration area is an area depended upon to carry out life processes.

“**habitat**” means

(a) in respect of aquatic species, spawning grounds and nursery, rearing, food supply, migration and any other areas on which aquatic species depend directly or indirectly in order to carry out their life processes, or areas where aquatic

species formerly occurred and have the potential to be reintroduced; and (b) in respect of other wildlife species, the area or type of site where an individual or wildlife species naturally occurs or depends on directly or indirectly in order to carry out its life processes or formerly occurred and has the potential to be reintroduced.

The definition in relation to other species excludes reference to *migration*. This lack of specificity could be argued to exempt migration routes from the definition of *habitat*. Yet, in response, it could be argued that migration areas are simply a subset of areas where species naturally occur or depend upon directly or indirectly to carry out life processes.

4.7 Australia

The Environment Protection and Biodiversity Conservation Act 1999 provides for national protection of the environment including promotion of the conservation of biodiversity. The Act establishes a system to protect native species and ensure ecosystem protection. Critical habitat protection is a protective measure employed by the Act, which relies upon a definition of habitat as follows:

habitat means the biophysical medium or media:

- (a) occupied (continuously, periodically or occasionally) by an organism or group of organisms; or
- (b) once occupied (continuously, periodically or occasionally) by an organism, or group of organisms, and into which organisms of that kind have the potential to be reintroduced.

The term *biophysical medium* is broad and would potentially capture the air resource. Despite this, the material reviewed revealed that critical habitat registered pursuant to the Act tended to rely upon terrestrial demarcation to identify the habitat in question.⁴⁶

In addition, a New South Wales federal statute, the Threatened Species Conservation Act 1995, contains the following definition:

⁴⁶ For example, the description of Macquarie Island as critical habitat for *Diomedea exulans* (wandering albatross): *Location and extent: Macquarie Island: About 13,000 ha, comprising all islands and rocks above mean high water level, lying within the area bounded by parallels 54° 27' S and 54° 49' S latitude and meridians 158° 45' E and 158° 59' E longitude* <<http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcriticalhabitat.pl?id=3>> (access date 29 March 2007).

“**habitat**” means an area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community and includes any biotic or abiotic component.

This definition relies on the concept of *occupation*, even occasional. It makes specific reference to both biotic and abiotic components of the habitat, and would apparently include airways. Interestingly, the definition is not limited to *land* occupied by species. If it were, relying on the definition of land below, then the air resource would be excluded from habitat. The specific reference to *area* would suggest that resources in addition to land must be included in the definition of habitat:

“**land**” includes:

- (a) buildings and other structures permanently fixed to land, and
- (b) land covered with water, and
- (c) the sea or an arm of the sea, and
- (d) a bay, inlet, lagoon, lake or body of water, whether inland or not and whether tidal or not, and
- (e) a river, stream or watercourse, whether tidal or not.

4.8 Extraneous New Zealand Considerations

Despite extensive searches there is little New Zealand research, statutory material, or case law which directly discusses the limits of the concept of habitat in the context of resource management. The term *habitat* is used widely in statutes and regulations, but generally without any supporting definition. Where there is some recognition of the extent of the concept, the term *habitat* tends to be applied broadly, incorporating the environment in which the animal occurs.

The Animal Welfare (Zoos) Code of Welfare 2004 provides an interesting insight as to how habitat is viewed in the context of caring for animals in a zoo environment. The Code is prepared pursuant to the Animal Welfare Act 1999 which established the National Animal Welfare Advisory Committee (“NAWAC”), and provided for the issue of codes of welfare with legal effect. Clause 1.8.2 of the Code defines animals to include birds. The Physical and Social Environments of the animals are regulated by clause 5.1, which provides:

Animals in zoos need to be held and exhibited in an environment in keeping with their physical, health and behavioural needs, and as far as possible in keeping with their natural or ecological habitats.

Each animal of the species that is held and exhibited has special needs and requirements that should be taken into account when designing and constructing

facilities to hold, display and transport them. Enclosure environments should replicate or mimic the natural habitat, e.g ...

- birds need to have the freedom to fly

Although habitat is not defined by the Code, operation of the Code rests on the assumption that flight and freedom to fly are conditions of habitat. Without freedom to fly a natural habitat for many species could not be replicated in terms of the Code.

The Conservation Act, as amended by s 8 of the Conservation Amendment Act 1996, provides in Part IV for Specially Protected Areas, which include wildlife management areas. Section 23B requires that each such area be managed so that its wildlife and wildlife habitat values (including the capacity for the movement of wildlife, genetic material of indigenous plants, and genetic material of wildlife) are protected. This section specifically contemplates that wildlife⁴⁷ habitat values include the capacity for the movement of wildlife. As a prime mode of movement for birds, it can be assumed that flight is captured by this description.

5. CONCLUSION

In conclusion, it can be seen that the term *habitat* is used widely in modern law- and policy-making. However, a universal approach to the application and definition of the concept cannot be identified. The most common definition of *habitat* tends to be framed in reliance on the notion of *areas of natural occurrence*. In the context of the RMA and flight paths, in this article it is contended that in order to afford full and holistic protection of indigenous avian species, that habitat should be interpreted as including air space occupied by birds for the purposes of foraging and general life activities.

Applying a resource-based approach to discerning the parameters of a habitat and capturing the essential ecological requirements of that habitat enables protection of vital conditions of existence. Failure to do this, by tying protection to mere lines on maps, dilutes the essence of habitat protection and renders it susceptible to capture and domination by other forces. Where a regime such as the RMA prioritises habitat protection as a national goal, a lesser result for indigenous avian species will be achieved if areas of air space expertly identified as significant to the survival of the species cannot be defined as constituting significant habitat within the meaning of s 6(c).

47 As defined by s 23B(2) to mean native animal.