Kenepuru & Central Sounds Residents Association Inc.

Planning Technician

Marlborough District Council
PO Box 43

Blenheim 7240

Email: MEP@marlborough.govt.nz

Ross Withell
President KCSRA
2725 Kenepuru Road
RD 2
Picton 7282
email: president@kcsra.org.nz
WWW: kcsra.org.nz

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Dear Sir/Madam

Submission on Proposed Marlborough Environment Plan ('MEP')

I am presenting this submission covering chapters 6, 7, 8 and 13 of the MEP in my capacity as President of the Kenepuru and Central Sounds Residents' Association Incorporated (KCSRA).

Who are we

KCSRA was established in 1991 and currently has over 260 household members whose residents live full-time or part-time in the Kenepuru and Pelorus Sounds. The Association's objects include, among others, to coordinate dealings with central and local government and promote the interests of residents of the Kenepuru and the Central Sounds area and to promote and act in the best interests of residents, ratepayers and persons associated with the Kenepuru and Central Sounds area.

What do we do

KCSRA works hard to represent our members on a range of issues. For example, advocating for better and safer roads and provision of public amenities in places of high visitor use, liaison and representations to the local council and central government, and involvement in local environmental/conservation issues. To see a fuller description of our activities visit our web site and look under the "Public Documents" section (www.kcsra.org.nz).

Why are we Submitting

The Marlborough Sounds is rightly described in the MEP as "the jewel in the Crown" of the Marlborough region. Our members greatly appreciate and value of this magnificent area with its striking land and seascapes. Our members appreciate that it is also a fantastic national asset that needs to be safeguarded for future generations of New Zealanders. Sadly over the last decade or so it has become clear that the marine space of the Sounds is in a poor state of environmental health and under pressure from many sources.

Much of this adverse pressure has arisen from past management and regulatory mistakes and oversights. All too often it seems that short term commercial objectives arguing export dollars and jobs have been favoured against long term sustainable management practices/uses. By way of example, this short term focus has seen excessive marine farm development in low flush areas where the cumulative negative impacts (both ecological and other) are only now being identified and grappled with.

We see the MEP as an important opportunity to both rectify these mistakes of the past and to set up a more objective and sustainable framework for going forward for the benefit of all stakeholders. It is clear that changes, including reductions in activity in some areas, are going to have to occur. We call on Marlborough District Council ('MDC') policy and decision makers to show the resolve that is needed to step up and appropriately address these issues as required.

Overall we are generally pleased with the MEP and congratulate the team on what has clearly been a tumultuous task in pulling everything together. As noted below however, we hold serious reservations in regards to landscape and natural character matters.

Supplementary Reports

This report appends two supplementary reports. A report by Dr Mike Steven entitled *Review of Landscape & Natural Character Chapters, Landscape and Natural Character Overlays, & Boffa Miskell Ltd Landscape & Natural Character Studies* dated 20 August 2016 (Appendix A) , and a report by Ryder Consulting (Dr Brian Stewart) entitled *Mussel Farming in Central Pelorus Sound* dated 3rd December 2015 (Appendix B). These reports form part of this submission and our submission points should be read in light of the conclusions, criticisms and recommendations as made in these reports.

1. Natural Character and Landscape – General

1.1 It is imperative that we refer firstly to the Appendix A report prepared by Dr Mike Steven. It is unfortunately clear from this report that the assessments and mapping of natural character and landscape in the Marlborough Sounds are fundamentally flawed. This is of some concern to us given the importance of landscape and natural character to the Marlborough Sounds environment and to the operation of the MEP.

1.2 We adopt the conclusions of Dr Steven in his report and accordingly **submit** that the analysis and mapping of natural character and landscape over the central Marlborough Sounds areas is neither plausible nor credible and renders large tracts of the Central Sounds inadequately protected. One might certainly be forgiven for perceiving that landscapes (including seascapes) and natural character in Central Sounds areas have been assessed and mapped with current or proposed marine farming in mind. We hope for an alternative explanation as this perception has quite disturbing connotations, not least to the credibility of the proposed MEP.

1.3 Whatever the cause we **submit** that the criticisms and recommendations of Dr Steven be fully recognised and that the MEP be amended accordingly. This is essential in terms of affording the legislatively required degree of protection to Central Sounds areas where as proposed there are, for example, and inexplicably, no outstanding natural landscapes at all and vast areas of highly valued seascape unprotected.

1.4 Dr Steven's criticisms and recommendations are also pertinent at a wider level. They must be adopted to impose the grounding that is required in landscape and natural character assessment practices, including in perspectives, in differentiation between natural character and landscape factors, and in clarity of definitions and concepts. These are fundamental to ensuring more objectivity, more correct outcomes and more certainty for all stakeholders going forward.

1.5 The balance of this submission focuses more finely on some of the objectives and policies of Chapters 6, 7, 8 and 15 of the MEP.

2. Natural Character – Chapter 6

Our submissions on Natural Character must be read subject to our fundamental concerns as raised above with regard to the assessments, mapping, differentiations, perspectives, terminology and other matters raised by Dr Steven in the appended report.

2.1 <u>Policy 6.1.4</u>

This reads: *"Identify those areas of the coastal environment that have high, very high or outstanding natural character."*

This policy needs to be **extended** in two ways, as outlined below.

- **Firstly, to Include a natural character assessment of all Marlborough Sounds coastal environment areas, irrespective of whether considered to be 'High' or above.**

The need to assess impacts on natural character is not restricted to areas of High natural character or above. For example, the NZCPS 13(b) requires that significant adverse impacts on natural character be avoided - irrespective of status as High or above, as indeed does MEP policy 6.2.1.

Whilst NZCPS 13(c) prescribes a minimum requirement by requiring the mapping or identifying of at least 'High' natural character areas, to effectively administer the coastal environment of the Marlborough Sounds **we submit** that all coastal environments should be mapped and graded to a seven point natural character scale.

By mapping only areas considered to have High natural character an inference is given, and will be taken by resource consent applicants, that effects on natural character that is already below a 'high' level are not a relevant assessment consideration. This is clearly inappropriate.

If assessing all of the Marlborough Sounds coastal environment area into natural character classifications is not practical then policy 6.1.4 should **make it clear** that areas classified below high are only excluded from the maps *on practicality grounds* and that all policies on natural character in the MEP also *apply* to these areas.

- **Secondly, to Include the Identification of Areas Adversely Impacted by Reversible Effects**

  It is necessary to identify areas where natural character may not be high, but where it is only less than high because of development that can be reversed through resource consent conditions or consent renewal procedures.

  In our view this is required under **NZCPS Policy 7** (*Identify in regional policy statements, and plans, coastal processes, resources or values that are under threat or at significant risk from adverse cumulative effects)* and **NZCPS Policy 14** (a) (*identifying areas and opportunities for restoration or rehabilitation)*.

  For example, this would encompass the identification and mapping of areas where and to the extent that natural character is significantly adversely effected and/or not classified as high due only to activities operating under finite coastal permit terms, such as marine farms. This would provide some perspective and objectivity with regard to over-farming issues in the Central Sounds area and as such would greatly assist in the determination of appropriate responses and resolutions to this issue.

2.2 <u>Policy 6.2.2</u>

This reads: *"Avoid significant adverse effects of subdivision, use or development on coastal natural character, having regard to the significance criteria in Appendix 4."*

We agree with this policy. However, **it should be made clear** that policy 6.2.7 (cumulative effects) must be applied when determining whether there are significant adverse effects under policy 6.2.2.

2.3 Policy 6.2.3

This reads: *"Where natural character is classified as high or very high, avoid any reduction in the degree of natural character of the coastal environment or freshwater bodies."*

2.3.1 We **agree** with this policy to the extent that it sets an objective threshold for assessing significant adverse effects on natural character under NZCPS Policy 13(1)(b) – being the reduction of the natural character of a locality to a classification below that which would exist without the activity. Objective assessment criteria such as this provides much valued certainty.

2.3.2 We note that it is not clear what a 'classification' is. **This should be clarified** – and in our view a seven point 'classification' scale encompassing very low, low, moderate-low, moderate, moderate high, high and very high should be specified as appropriate.

2.3.3 However, we **strongly disagree** with the purported restriction of this policy to only areas of High natural character or above. Significant adverse natural character effects on areas classified below a High natural character must also be avoided under Policy 13(1)(b) of the NZCPS. No rationale is given for nonetheless seeking to apply this policy only to areas of high natural character or above and we cannot conceive of any rational basis for this policy proposing to do this. An activity that takes an area of Moderate to High natural character down to an area of Moderate to Low natural character must be avoided under NZCPS Policy 13(1)(b) as much as an activity that takes an area from a High classification down to a Moderate classification. As such, this policy must be amended so that it applies *whether or not* the natural character is classified as high or very high.

2.3.4 We also **submit** that it should be **made clear** that policy 6.2.7 (cumulative effects) applies when assessing the degree of natural character changes. Assessing natural character changes of individual activities in isolation of the cumulative effect of similar activities in the same locality is meaningless and contrary to the directives given by NZCPS Policy 7(2).

2.3.5 We also **submit** that Appendix 2 needs to be re-written to clearly identify the specific *natural elements, patterns and processes* that must be preserved and protected within each coastal marine and coastal terrestrial area of the coastal environment. Many of the "values" listed in Appendix 2 are totally irrelevant in this regard.

2.4 Policy 6.2.4

This reads: *"Where resource consent is required to undertake an activity within coastal or freshwater environments with high, very high or outstanding natural character, regard will be had to the potential adverse effects of the proposal on the elements, patterns, processes and experiential qualities that contribute to natural character."*

2.4.1 The purpose or function of this policy **is vague** and we **disagree** to the extent that it only applies to areas of high or above high natural character classification. Section 6(a) of the RMA and Policy 13 of the NZCPS demand natural character assessments on areas classified as less than high and any such assessment must necessarily have regard to the potential adverse effects of the proposal on the elements, patterns, processes and experiential qualities that contribute to the locality's natural character. On this basis it is difficult to see the purpose of policy 6.2.4, let alone any basis for the discrimination between high and other classifications of natural character.

2.4.2 If the intention of this policy is simply to require that natural character assessments for areas of high natural character have particular regard to the characteristics listed for that area in Appendix 2, then the policy should be **clearly re-worded to say just that**. However, at the same time it should **also be made clear** that the same analysis is required for areas of less than high natural character classification but by reference to the particular elements, patterns and processes as actually exist for that area (as opposed to those as listed in Appendix 2 for areas of high natural character).

2.4.3 We also note that as it reads policy 6.2.4 will be taken to suggest that it is not necessary to assess the effects of a proposal on the elements, patterns, processes and experiential qualities of a less than high classified natural character area. **This is obviously inappropriate** and the policy should be amended as suggested above.

2.5 Policy 6.2.5

This reads: *"Recognise that development in parts of the coastal environment and in those rivers and lakes and their margins that have already been modified by past and present resource use activities is less likely to result in adverse effects on natural character."*

2.5.1 We **disagree** with this policy. Whilst at first blush it appears to have some basis, on closer analysis it is too subjective and will lead to inequitable and inappropriate development outcomes. We note that a similar policy in the existing Marlborough Sounds Resource Management Plan stemmed from the old 1994 NZCPS policy 1.1.1(a) - the genesis of which was not carried over to the 2010 NZCPS. The problems with such a policy are:

- It will conflict with cumulative impact policy. For example, does it mean that all development should be funnelled into an area already developed irrespective of cumulative effects ?
- It will lead to inordinate and inequitable precedent implications. For example, should the introduction of one development into one area render the stakeholders of that particular area the unfortunate bearers of all adverse natural character effects from the future development that this policy would thenceforth shoehorn into that area ?
- Leads to propositions that the plan positively contemplates development in an area simply because it is already carrying a degree of adverse natural character effects.

2.6 Policy 6.2.6

This reads: *"In assessing the appropriateness of subdivision, use or development in coastal or freshwater environments, regard shall be given to the potential to enhance natural character in the area subject to the proposal."*

2.6.1 We **agree** with this policy to the extent that opportunities should be taken to enhance natural character when assessing applications for subdivision, use or development in the Marlborough Sounds coastal environment, including through conditions of consent.

2.6.2 NZCPS Policy 14 requires that the Marlborough District Council promote the restoration or rehabilitation of the natural character of the coastal environment *including by identifying areas and opportunities for restoration and rehabilitation and/or by prescribing policies rules and other methods directed at restoration or rehabilitation*.

2.6.3 In our view it should be **made clearer** in Policy 6.2.6 that opportunities for restoration or rehabilitation include declining applications for resource consent renewals in localities where significant adverse cumulative effects on natural character exist (as per Policies 6.2.3 and 6.2.7).

2.6.4 NZCPS Policy 14(b) requires that policies, rules and other methods directed at restoration and rehabilitation be included in the MEP. At a *minimum* Policy 6.2.6 **should prescribe** that 'consent renewal attrition' (through the decline of renewal applications as they arise) may be applied as a default method of addressing adverse natural character cumulative effects where there are multiple contributing activities.

2.7 Policy 6.2.7

This reads: *"In assessing the cumulative effects of activities on the natural character of the coastal environment, or in or near lakes or rivers, consideration shall be given to:*

(a) the effect of allowing more of the same or similar activity;

(b) the result of allowing more of a particular effect, whether from the same activity or from other activities causing the same or similar effect; and

(c) the combined effects from all activities in the coastal or freshwater environment in the locality."

2.7.1 We **agree** with this policy. It is critical that cumulative impact policies are implemented and applied in practice as a control of 'consent creep' and the eventual death of environments by a thousand cuts. It is also critical that cumulative impact policies are implemented and applied in consent renewal situations, particularly where cumulative impacts were not properly considered or assessed in the original consent process.

2.7.2 NZCPS Policy 7 requires that coastal processes, resources or values that are under threat or at significant risk from adverse cumulative effects be identified and that provisions be made in plans to manage these effects, including, where practicable, through the setting of thresholds (including zones, standards or targets), or specifying acceptable limits to change, to assist in determining when activities causing adverse cumulative effects are to be avoided.

2.7.3 Policy 6.2.7 does not, of itself, meet the requirements of NZCPS Policy 7. In this regard it **should be made clear** that policy 6.2.7 is to be applied when applying the following policies:

- *6.2.6 (when identifying areas and opportunities for restoration and rehabilitation); and*
- *6.2.3 (when assessing for degree of natural character change); and*
- *6.2.2 (when assessing for significant adverse effects on natural character); and*
- *6.1.4 (when identifying and mapping areas where there are reversible adverse cumulative natural character effects).*

2.7.4 The following paragraphs should **also be added** to meet the requirements of NZCPS 7:

"Acceptable limits of cumulative effects will be determined by reference to the thresholds specified in a particular policy and by reference to best practice and international assessment standards.

Where a retraction of consented activities is required to meet acceptable cumulative effect thresholds then this may occur by re-consenting attrition until acceptable levels of cumulative effects are reached or through the application of activity retraction guidelines developed and agreed with stakeholders"

2.7.5 For clarity, we note that there is no basis for differentiating cumulative environmental effect assessments for new activities over those for renewal applications. This is not least because there are various areas where there have been significant historical failures to consider appropriate thresholds of development or cumulative effects when granting existing consents. It should thus be **made clear** that policy 6.2.7 applies to the re-consenting of activities in the coastal environment as well as to the consenting of new activities in the coastal environment.

3. Landscape – Chapter 7

Our submissions on Landscape must be read subject to our fundamental concerns as raised above with regard to the assessments, mapping, differentiations, perspectives, terminology and other matters raised by Dr Steven in his attached report.

3.1 Policy 7.1.4

This reads: *"Landscapes that meet the criteria to be identified as an outstanding natural feature and landscape, or landscapes with high amenity value, where those values are more sensitive to change:*

(a) are specifically identified on the Landscape Overlay; and

(b) the specific values associated with the identified landscapes are set out in Appendix 1 of Volume 3 of the Marlborough Environment Plan."

3.1.1 We **agree** that all of the Marlborough Sounds is identified as having at least high landscape amenity value that is sensitive to change. This is subject to the matters as identified by Dr Steven in his attached report.

3.2 Policy 7.2.3

This reads: *"Control activities that have the potential to degrade the amenity values that contribute to those areas of the Marlborough Sounds Coastal Landscape not identified as being an outstanding natural feature and landscape by:*

(a) using a non-regulatory approach as the means of maintaining and enhancing landscape values in areas of this landscape zoned as Coastal Living;

(b) setting standards/conditions that are consistent with the existing landscape values and that will require greater assessment where proposed activities and structures exceed those standards; and

(c) requiring resource consent for commercial forestry activities."

3.2.1 We **disagree** with this policy to the extent that only commercial forestry activities are specified as requiring resource consent due to landscape impacts in the Marlborough Sounds Coastal Landscape. Marine farming has significant adverse effects on coastal

landscape values and as such marine farming must be included in paragraph (c) as well.

3.3 Policy 7.2.4

This reads: *"Where resource consent is required to undertake an activity within an outstanding natural feature and landscape or a landscape with high amenity value, regard will be had to the potential adverse effects of the proposal on the values that contribute to the landscape."*

3.3.1 We **agree** with this policy to the extent that an assessment for a resource consent application must take into account the impact of a proposal on the Marlborough Sounds coastal landscape.

3.3.2 However, any such assessment must also necessarily consider the cumulative landscape impacts from other activities in the area and whether, overall, impacts are within acceptable thresholds. This is required by NZCPS Policy 7. As such, policy 7.2.4 should **make it clear** that the cumulative effects policy (as follows) must be applied when applying policy 7.2.4.

3.3.3 NZCPS 7 requires that MDC identify resources or values that are under threat or at significant risk from adverse cumulative effects and include provisions in plans to manage these effects including, where practicable, specifying acceptable limits to change in order to assist in determining when activities causing adverse cumulative effects are to be avoided.

3.3.4 There is no policy within the landscape chapter that addresses the requirements of NZCPS 7 in regards to adverse cumulative landscape effects. A specific cumulative effects landscape values policy **must be included** to meet the requirements of NZCPS Policy 7 – in a similar vein to that as has been included in Chapter 6 for natural character effects. Such a policy **should prescribe**:

- The positive identification of areas where coastal marine landscape values are under threat from adverse cumulative effects; and
- That for all activities requiring a resource consent in the coastal marine environment, an assessment of cumulative adverse landscape effects be undertaken considering:
  - (a) the effects of the existing level of activity;
  - (b) the result of re-consenting or allowing more of a particular effect, whether from the same activity or from other activities causing the same or similar effect; and
  - (c) the combined effects from all activities in the coastal marine environment in the locality.

- That an unacceptable threshold for adverse cumulative landscape effects in the coastal marine environment is represented by the landscape classification of the landscape affected by the activity moving from one classification value down to a lower classification of landscape on a seven point scale because of cumulative adverse landscape effects.
- That where a retraction of consented activities is required to meet acceptable cumulative effect thresholds then this may occur by re-consenting attrition until acceptable levels of cumulative effects are reached or through the application of activity retraction guidelines developed and agreed with stakeholders.

3.4 Policy 7.2.5

This reads: *"Avoid adverse effects on the values that contribute to outstanding natural features and landscapes in the first instance. Where adverse effects cannot be avoided and the activity is not proposed to take place in the coastal environment, ensure that the adverse effects are remedied."*

3.4.1 We **agree** with this policy, notably with regard to assessments in relation to the coastal environment. NZCPS Policy 15 directs that adverse effects on outstanding natural landscape or features must be avoided.

3.5 Policy 7.2.8

This reads: *"Recognise that some outstanding natural features and landscapes and landscapes with high amenity value will fall within areas in which primary production activities currently occur."*

3.5.1 We **disagree** with this policy. It appears to have no purpose or function and we cannot conceive of a situation when it might actually have any substantive basis for application. It can only be taken as being a policy that is intended to condone the re-consenting of regulated or controlled activities notwithstanding more than minor or significant adverse landscape effects. Outside of existing use rights under section 10 of the RMA *there is no legal or other basis that can justify such a policy*. As such the policy achieves little more than create a fiction of existing use rights that do not exist. This policy should thus be removed or it should be **made clear that it only has application** in situations where there are existing use rights under section 10 of the RMA.

3.5.2 This is especially relevant to marine farming activities in the coastal marine area (where section 10 of the RMA does not apply) where historical consent assessments have either failed to or have inadequately considered cumulative adverse landscape effects or where landscape sensitivity has altered, such as through indigenous re-vegetation.

3.6 Policy 7.2.9

This reads: *"When considering resource consent applications for activities in close proximity to outstanding natural features and landscapes, regard may be had to the matters in Policy 7.2.7."*

3.6.1 We **disagree** with this policy to the extent that both it and policy 7.2.7 fail to accommodate the impact of marine farming structures in close proximity to outstanding natural features and landscapes.

3.7 Policy 7.2.10

This reads: *"Policy 7.2.10 – Reduce the impact of wilding pines on the landscape by:*
(a) supporting initiatives to control existing wilding pines and limit their further spread; and
(b) controlling the planting of commercial wood species that are prone to wilding pine spread."

3.7.1 We **agree** with this policy. It is particularly important that wilding pine eradication in the Marlborough Sounds is encouraged and that strong controls are imposed on the planting of invasive commercial wood species.

3.8 Methods of Implementation
Methods 7.M.3 – 7.M.8

3.8.1 We **broadly agree** with the suggested methods, guidelines, incentives, investigation, and information packages to maintain and enhance the landscape values of the Marlborough Sounds. However, we note that the list of regulated activities in 7.M.3 omits marine farming and **submit** that this should obviously be included.

3.8.2 We further **submit** that guidelines be included for the implementation of consent attrition when required under policy 7.2.4

4. Chapter 8 – Indigenous Biodiversity

4.1 Objective 8.1

This reads: *"Marlborough's remaining indigenous biodiversity in terrestrial, freshwater and coastal environments is protected."*

4.1.1 We **agree** with this objective. It is particularly important to us that what remains of our coastal marine biodiversity in the Marlborough Sounds is properly protected.

4.2 Objective 8.2

This reads: *"An increase in area/extent of Marlborough's indigenous biodiversity and restoration or improvement in the condition of areas that have been degraded."*

4.2.1 We **agree** with this objective. For the reasons given in the objective, every management and intervention opportunity should be taken to increase indigenous biodiversity of the coastal marine area of the Marlborough Sounds.

4.3 Policy 8.1.2

This reads: *"Sites in the coastal marine area and natural wetlands assessed as having significant indigenous biodiversity value will be specifically identified in the Marlborough Environment Plan."*

4.3.1 It is important to the Association that all remaining ecologically significant areas of the coastal marine area in the Marlborough Sounds are identified and protected. However, we are concerned that there are ecologically significant marine sites of the Marlborough Sounds that have not been discovered or that have erroneously been omitted from the MEP. As such, **it should be made clear** that marine sites not specifically identified by the MEP, but which nonetheless meet the criteria for ecologically significant marine sites, *are to be treated under the MEP in the same way as if they had been identified as ecologically significant marine sites under Policy 8.1.2*. In other words, it is **not appropriate** that only those areas of significant indigenous biodiversity value that have been identified have policy protection under the MEP.

4.4 Policy 8.1.3

This reads: *"Having adequate information on the state of biodiversity in terrestrial, freshwater and coastal environments in Marlborough to enable decision makers to assess the impact on biodiversity values from various activities and uses."*

4.4.1 We **agree** with this policy.

4.4.2 However, **it should be extended** to include the attainment of knowledge on the degree of change that has occurred in coastal marine indigenous flora and fauna biodiversity and abundance *that may be reversible and that is attributable to activities that can be managed by resource consent conditions or processes* – notably with regard to marine farming. This knowledge is important in terms of identifying opportunities to enhance indigenous flora and fauna abundance and biodiversity and to assess whether acceptable limits of adverse ecological cumulative effects caused by regulated activities such as marine farming are being exceeded.

4.4.3 The need for such information has become very clear to us through various resource consent and environment court hearings recently whereat the sad lack of any monitoring of water column, benthic and other ecological impacts of intensive mussel farming has become very apparent. The threats posed to the delicate balance of indigenous ecosystems by intensive mussel farming in low flush and low mesotrophic/oligotrophic bays such as Clova Bay, Beatrix Bay and Crail Bay are serious. These concerns are highlighted in the supplementary report of Dr Brian Stewart.

4.5 Policy 8.2.1

This reads: *"A variety of means will be used to assist in the protection and enhancement of areas and habitats with indigenous biodiversity value, including partnerships, support and liaison with landowners, regulation, pest management, legal protection, education and the provision of information and guidelines."*

4.5.1 We **agree** with this policy. However, it should be **extended** to include the determination of acceptable cumulative ecological impact thresholds ('ecological carrying capacities') for regulated activities in the coastal marine area such as marine farming.

4.5.2 This is particularly important for areas such as Clova Bay, Beatrix Bay and parts of Crail Bay and the Kenepuru Sound where available evidence suggests that a*cceptable ecological impact thresholds are being exceeded*. This is unequivocally confirmed in Dr Brian Stewarts report whereat he concludes *"indications are that ecological carrying capacity is being exceeded in the central Pelorus area"*.

4.6 Policy 8.2.2

This reads *"Use a voluntary partnership approach with landowners as the primary means for achieving the protection of areas of significant indigenous biodiversity on private land, except for areas that are wetlands."*

4.6.1 We **agree** with this policy, and support the Significant Natural Areas (SNA) programme that the Council has implemented over the past 15 years.

4.7 Policy 8.2.3

This reads: *"Priority will be given to the protection, maintenance and restoration of habitats, ecosystems and areas that have significant indigenous biodiversity values, particularly those that are legally protected."*

4.7.1 We agree that it is important that areas of significant indigenous biodiversity value be protected. However, it is equally as important that there is not any significant adverse effect on other areas of indigenous biodiversity. The policy should thus **be amended** by adding the following to the end:

"and to protecting other areas of indigenous biodiversity from significant adverse effects."

4.8 Policy 8.2.9

This reads: *"Maintain, enhance or restore ecosystems, habitats and areas of indigenous biodiversity even where these are not identified as significant in terms of the criteria in Policy 8.1.1, but are important for:*

(a) the continued functioning of ecological processes;
(b) providing connections within or corridors between habitats of indigenous flora and fauna;
(c) cultural purposes;
(d) providing buffers or filters between land uses and wetlands, lakes or rivers and the coastal marine area;
(e) botanical, wildlife, fishery and amenity values;
(f) biological and genetic diversity; and
(g) water quality, levels and flows."

4.8.1 We **agree** with this policy. The marine ecosystem functions as a whole and there must be a focus on maintenance, enhancement and restoration of all parts.

4.9 Policy 8.2.12

This reads: *"Encourage and support private landowners, community groups and others in their efforts to protect, restore or re-establish areas of indigenous biodiversity."*

4.9.1 We **agree** with this policy. That said, a major concern the Association holds is the impact of the imbalance in available industry resources as against available public resources. Whilst there is a pool of permanent residents in the Sounds by far the greater interest is held by the hundreds of thousands of people who use the Sounds on an itinerant basis. Whilst the collective value in the Sounds held by these stakeholders is huge, their interests are individually insufficient to warrant them engaging in matters such as this plan review

or resource consent applications that potentially impact on their values.

4.9.2 As a consequence the collective strength of the voice of this vast interest group is seldom heard at the likes of resource consent hearings or this plan review and the load of effectively representing all of these stakeholders is left to be carried by a small number of local residents who are themselves often under resourced and unfamiliar with the procedures, plans and law at issue.

4.9.3 Against the resources of industry this resulting imbalance has led, and will continue to lead, to decisions being made that are against the greater public will and that are gradually eroding and threatening the ecological and other values of the Sounds that are held by the general public.

4.9.4 In our view this policy **should thus be widened** to include:

"the facilitation or funding of professional advocates and experts to represent the interests of residents and wider public stakeholder groups in Marlborough Sounds planning and public resource consent matters of significance."

4.10 Policy 8.3.1

This reads: *"Manage the effects of subdivision, use or development in the coastal environment by:*

(a) avoiding adverse effects where the areas, habitats or ecosystems are those set out in Policy 11(a) of the New Zealand Coastal Policy Statement 2010;

(b) avoiding adverse effects where the areas, habitats or ecosystems are mapped as significant wetlands or ecologically significant marine sites in the Marlborough Environment Plan; or

(c) avoiding significant adverse effects and avoiding, remedying or mitigating other adverse effects where the areas, habitats or ecosystems are those set out in Policy 11(b) of the New Zealand Coastal Policy Statement 2010 or are not identified as significant in terms of Policy 8.1.1 of the Marlborough Environment Plan."

4.10.1 We **agree** with this policy. In our view it important that both adverse effects on ecologically significant areas are avoided and that significant adverse effects are avoided on all other marine areas.

4.11 Policy 8.3.2

This reads: *"Where subdivision, use or development requires resource consent, the adverse effects on areas, habitats or ecosystems with indigenous biodiversity value shall be:*

(a) avoided where it is a significant site in the context of Policy 8.1.1; and

(b) avoided, remedied or mitigated where indigenous biodiversity values have not been assessed as being significant in terms of Policy 8.1.1."

4.11.1 We **agree with paragraph (a)** of this policy. However it is important that *significant* adverse effects are avoided on *all areas* of indigenous biodiversity in the marine environment. Further, as it reads Policy 8.3.2 does not reconcile with Policy 8.3.1.

4.11.2 As such, paragraph (b) of policy 8.3.2 **should be corrected** to record *"avoided if significant and avoided, remedied or mitigated where indigenous biodiversity values have not been assessed as being significant in terms of Policy 8.1.1."*

4.12 *Policy 8.3.5*

This reads: *"In the context of Policy 8.3.1 and Policy 8.3.2, adverse effects to be avoided or otherwise remedied or mitigated may include:*

(a) fragmentation of or a reduction in the size and extent of indigenous ecosystems and habitats;

(b) fragmentation or disruption of connections or buffer zones between and around ecosystems or habitats;

(c) changes that result in increased threats from pests (both plant and animal) on indigenous biodiversity and ecosystems;

(d) the loss of a rare or threatened species or its habitat;

(e) loss or degradation of wetlands, dune systems or coastal forests;

(f) loss of mauri or taonga species;

(g) impacts on habitats important as breeding, nursery or feeding areas, including for birds;

(h) impacts on habitats for fish spawning or the obstruction of the migration of fish species;

(i) impacts on any marine mammal sanctuary, marine mammal migration route or breeding, feeding or haul out area;

(j) a reduction in the abundance or natural diversity of indigenous vegetation and habitats of indigenous fauna;

(k) loss of ecosystem services;

(l) effects that contribute to a cumulative loss or degradation of habitats and ecosystems;

(m) loss of or damage to ecological mosaics, sequences, processes or integrity;

(n) effects on the functioning of estuaries, coastal wetlands and their margins;

(o) downstream effects on significant wetlands, rivers, streams and lakes from hydrological changes higher up the catchment;

(p) natural flows altered to such an extent that it affects the life supporting capacity of waterbodies;

(q) a modification of the viability or value of indigenous vegetation and habitats of indigenous fauna as a result of the use or development of other land, freshwater or coastal resources;

(r) a reduction in the value of the historical, cultural and spiritual association with significant indigenous biodiversity held by Marlborough's tangata whenua iwi;

(s) a reduction in the value of the historical, cultural and spiritual association with significant indigenous biodiversity held by the wider community; and

(t) the destruction of or significant reduction in educational, scientific, amenity, historical, cultural, landscape or natural character values."

4.12.1 We **agree** with the policy subject to the inclusion of a marine water column subparagraph, such as:

"alteration to the abundance or composition of natural water column elements including phytoplankton, zooplankton and/or palatable detritus."

4.13 Cumulative Effects Policy

4.13.1 NZCPS Policy 7 requires that coastal processes, resources or values that are under threat or at significant risk from adverse cumulative effects be identified and that provisions be made in plans to manage these effects, including, where practicable, through the setting of thresholds (including zones, standards or targets), or specifying acceptable limits to change, to assist in determining when activities causing adverse cumulative effects are to be avoided.

4.13.2 We note paragraph (l) in policy 8.3.5 above. However, there is no comprehensive cumulative effects biodiversity policy and in our view the requirements of NZCPS Policy 7 are clearly not met by paragraph (l) of policy 8.3.5.

4.13.3 It is particularly important that a **specific cumulative effects policy be included** to ensure that ecological tolerances are not being exceeded, or will not be exceeded, by situations where there is a multitude of individually held and applied for resource consents, such as is the case in the marine environment for marine farming.

4.13.4 We refer to the supplementary report by Dr Brian Stewart. The NIWA Biophysical Model for the Pelorus Sound signals the existence of potentially serious cumulative ecological water column effects from existing mussel farming activities in Clova Bay, Beatrix Bay,

parts of Crail Bay and parts of the Kenepuru Sound. Empirical studies such as *Zeldis* also suggest that the indigenous ecological systems of these areas are being put under stress by the existing level of mussel faring in these areas, undoubtedly in La Nina weather cycles. Basic ecological carrying capacity calculations recommended by the Aquaculture Stewardship Council also show that these areas are clearly under threat or at significant risk from cumulative water column effects.

4.13.5 **An appropriate policy to address these matters is required by NZCPS Policy 7.**

4.13.6 We would **submit the following policy as being appropriate** (based, for a start, on that as used in Chapter 6):

"In assessing cumulative effects of activities on the marine ecosystem consideration shall be given to:
(a) the effect of allowing more or of re-consenting the same or similar activity;
(b) the result of allowing more or re-consenting a particular effect, whether from the same activity or from other activities causing the same or similar effect; and
(c) the combined effects from all activities in the coastal environment in the locality."

Cumulative effects are relevant in and must be accommodated within all assessments of marine environment ecological effects, including the following policies:

- *8.1.3 (adequate information on the state of the marine environment); and*
- *8.2.1 (means to assist in the protection and enhancement of areas and habitats with indigenous biodiversity value); and*
- *8.2.3 (priority to protecting significant marine areas from adverse effects and to protecting all areas of indigenous biodiversity from significant adverse effects) ; and*
- *8.2.9 (maintenance, enhancement and restoration of indigenous ecosystems).*
- *8.3.1 (avoiding significant adverse coastal environment effects)*
- *8.3.2 (significant adverse effects on areas, habitats or ecosystems with indigenous biodiversity to be avoided)*

Acceptable limits of cumulative effects will be determined by reference to the thresholds specified in a particular policy and by reference to best practice and international sustainability and biodiversity preservation and enhancement standards.

Where a retraction of consented activities is required to meet acceptable cumulative effect thresholds then this may occur by re-consenting attrition until acceptable levels of cumulative effects are reached or through the application of activity retraction guidelines developed and agreed with stakeholders"

4.14 Policy 8.3.7

This reads: *"Within an identified ecologically significant marine site fishing activities using techniques that disturb the seabed must be avoided."*

4.14.1 We **agree** with this policy. However, in our view it is just as ecologically damaging to destroy vast areas of common Sounds benthic environment with trawling or dredging activities as it is to damage a small ecologically significant area.

4.14.2 As such, **we submit** that this policy be extended to encompass the protection of the wider Sounds benthic environment from being significantly adversely effected through fishing activities.

4.15 Policy 8.3.8

This reads: *"With the exception of areas with significant indigenous biodiversity value, where indigenous biodiversity values will be adversely affected through land use or other activities, a biodiversity offset can be considered to mitigate residual adverse effects. Where a biodiversity offset is proposed, the following criteria will apply:*

(a) the offset will only compensate for residual adverse effects that cannot otherwise be avoided, remedied or mitigated;

(b) the residual adverse effects on biodiversity are capable of being offset and will be fully compensated by the offset to ensure no net loss of biodiversity;

(c) where the area to be offset is identified as a national priority for protection under Objective 8.1, the offset must deliver a net gain for biodiversity;

(d) there is a strong likelihood that the offsets will be achieved in perpetuity;

(e) where the offset involves the ongoing protection of a separate site, it will deliver no net loss and preferably a net gain for indigenous biodiversity protection; and

(f) offsets should re-establish or protect the same type of ecosystem or habitat that is adversely affected, unless an alternative ecosystem or habitat will provide a net gain for indigenous biodiversity.

4.15.1 In our view biodiversity offsets are inappropriate in a marine environment. As such this policy should be amended to **make it clear** that it does not apply to the marine environment.

5. Chapter 13 - Use of the Coastal Environment

5.1 ***Policy 13.1.1 and 13.1.2***

These read as follows:

> *"13.1.1 Avoid adverse effects from subdivision, use and development activities on areas identified as having:*
>
> *(a) outstanding natural character;*
>
> *(b) outstanding natural features and/or outstanding natural landscapes;*
>
> *(c) significant marine biodiversity value and/or are a significant wetland; or*
>
> *(d) significant historic heritage value."*
>
> *"13.1.2 Areas identified in Policy 13.1.1 as having significant values will be mapped to provide certainty for resource users, Marlborough's tangata whenua iwi, the wider community and decision makers"*

5.1.1 Policy commentary recognises that it is not practical to identify all such areas and that further areas may be added through plan change processes as they are identified. However, as drafted it appears that the protections of Policy 13.1.1 cannot be applied to an area that is established as outstanding or of significant value unless and until it is actually included as such in the MEP through a plan change process.

5.1.2 In our view **this is inappropriate**. Having outstanding or significant value areas specifically identified provides certainty *in regards to those areas*. However, we can see no policy basis at all for denying other outstanding or significant value areas the protection of policy 13.2.1 simply because they are not (yet) recorded as such in the MEP. We note that whilst policies 13 and 15 of the NZCPS impose a requirement to identify areas, they do not go so far as to seek to limit their scope of protection to only identified areas. In this regard proposed MEP Policies 13.2.1 and 13.2.2 appear to contradict the requirements of the NZCPS.

5.1.3 **We submit** that it be made clear that policy 13.3.1 applies to areas identified on the balance of evidence as being outstanding areas or areas of significant value irrespective of whether or not they are yet specifically identified as such in the MEP.

5.2 **Policies 13.2.1 and 13.2.2**

5.2.1 These policies identify values to be considered in assessing activities in the coastal environment and matters to consider in determining the appropriateness of proposed activities.

5.2.2 We broadly agree with Policy 13.2.1. However, **we submit** that paragraph (g) in regard to amenity values might be better worded to refer to "*community perceptions of or expectations about "* coastal amenity value.

5.2.3 We **broadly agree** with Policy 13.2.2. However, we **do not agree with paragraph 13.2.2(c)**. This reads as follows:

"whether the efficient operation of established activities that depend on the use of the coastal marine area is adversely affected by the proposed subdivision, use or development activity"

5.2.4 This appears to be based on the fundamentally flawed proposition that an 'established activity' in the coastal marine area should have some form of 'first here' protection against other proposed activities in the area. This is **fundamentally flawed** because any activity undertaken in the coastal marine area is undertaken in the public domain. As such it can only ever be appropriate development (and an efficient use of resources) if it represents the optimal use of that public domain. Denying other activities simply because they might frustrate the efficiency of activities currently being undertaken in the public domain will simply deny the highest public utility being gained out of that public domain.

5.2.5 Paragraph (c) thus stands to represent a breach of public rights that can only lead to a suboptimal use and allocation of highly valued public marine resources.

5.2.6 As such **we submit** that paragraph (c) of Policy 13.2.2 is **inappropriate policy** and should **be deleted**.

5.3 Policy 13.2.3

This reads: *"To enable periodic reassessment of whether activities and developments are affecting the values of the coastal marine area, to encourage efficient use of a finite resource and in consideration of the dynamic nature of the coastal environment:*

(a) lapse periods for coastal permits will be no more than five years; and

(b) the duration of coastal permits granted for activities in the coastal marine area for which limitations on durations are imposed under the Resource Management Act 1991 will generally be limited to a period not exceeding 20 years."

5.3.1 **We agree** with this policy and the reasons as given for it. We are facing major environmental changes such as climate change coupled with rapidly changing public values and demands over the coastal marine areas of the Marlborough Sounds. As we have noted, we also have large knowledge gaps as regards the ecological impacts of some activities in the coastal marine environment, including marine farming activities.

5.4 Policies 13.2.4, 13.2.5 and 13.2.6

5.4.1 We **broadly agree** with the above policies. However, maintaining or enhancing amenity values of the coastal environment area requires that structures in the coastal marine environment do not adversely effect visual amenity (including cumulatively) beyond acceptable levels. There is no guidance given in these policies on the management of adverse visual amenity effects in this regard.

5.4.2 As such, **we submit** that a further paragraph be added to Policy 13.2.5 as follows:

"Recognising that there are adverse visual amenity effects of structures in the coastal marine environment (including cumulative) and ensuring that visual amenity is maintained and enhanced through the setting of guidelines or standards on acceptable levels or degrees of surface area structures within any particular area"

5.5 Policies 13.3.1 to 13.3.3

5.5.1 We **support** the permissive approach to recreational activity and the general thrust of policies 13.3.2 and 13.3.3

5.6 Policy 13.3.4

This reads: "Ensure recreational use has priority over commercial activities that require occupation of the coastal marine area in Queen Charlotte Sound, including Tory Channel."

5.6.1 The given rationale for this policy is that *"recreational use is particularly important in these areas, with a large number of holiday homes being a base for recreation and with good access points in Picton and Waikawa ... Historically, activities such as marine farming have been prevented from occurring in these areas because of the extent of recreational activities."*

5.6.2 We **agree** that New Zealand recreational interests should generally have priority over other activities in the coastal marine environment. However, in our view the policy rationale here is inappropriately worded. We do not see any policy that simply purports to set areas aside for particular activities as appropriate. A converse connotation is that all other areas are appropriate for development at the expense of recreational interests (when this is clearly not the case). In our view the policy focus should be on a deeper articulation of *why* the public use is given priority in an area. That is, because a concentration of public use will generally raise the importance of landscape, natural character, indigenous biodiversity, navigation, public access and other amenity values in that area to the point that it is simply very unlikely that a commercial activity, such as marine farming, would actually be considered appropriate development there. The appropriate policy response is to grant the public a pre-emptive right of use over that area in order to create certainty and to avoid

consent applications being made for commercial activities that would have very little likelihood of success.

5.6.3 This is an important point to make. As noted, a policy that simply prescribes some areas as having public use priority will be taken to suggest that all other areas are open for commercial development irrespective of public demands. This is of course not the case. The reality is that all of the same public amenity tests apply for all of the Marlborough Sounds, but that it is just not a foregone conclusion that consent for commercial activities would be denied.

5.6.4 As such, we **submit** that the rationale for Policy **13.3.4** be corrected to make it clear that it does not infer any lesser relevance of public use in assessing activities in other areas, and that priority is specifically given in the named areas for the sake of certainty and to avoid consent applications being made for commercial activities when there is very little likelihood of success.

5.6.5 We further **submit** that there are large tracts of area in the Kenepuru and Pelorus Sound that are just as popular and valuable for public use and recreation as Queen Charlotte Sound, if not more so. As such the distinction afforded Queen Charlotte Sound in this regard seems somewhat arbitrary and cannot be sustained.

5.6.6 We **submit** that Policy 13.3.4 **be amended and extended** to read:

> "Ensure recreational use has priority over commercial activities that require occupation of the coastal marine area in Queen Charlotte Sound, including Tory Channel, and in areas of the Pelorus Sound and Kenepuru Sound with high public use or environmental value."

5.7 Issue 13.C

5.7.1 **We applaud** the recognition of the importance of recreational diving and fishing to residents and visitors to the Marlborough Sounds and **we applaud** the recognition of community concern over the state of fish and shellfish stocks in the Marlborough Sounds and the sustainability of the recreational fisheries that they support.

5.8 Policies 13.4.1 and 13.4.2

5.8.1 **We agree** with these policies.

5.8.2 However, it is important to also recognise that declining recreational fish and shellfish stocks are attributable to factors beyond just recreational or commercial fishing pressure. For example, it is clear from the NIWA Pelorus Biophysical model that the degree of marine farming in the Clova Bay, Beatrix Bay, Crail Bay area, and on the north side of the Kenepuru Sound, is significantly depleting key water column elements, particularly zooplankton, and on this basis it is at least likely, if not probable, that they are materially

adversely effecting the recruitment success of recreational fish and shellfish stocks.

5.8.3 As such, we further **submit** that the following policies **be added** to this section:

"Use the coastal water quality programme and other Council initiatives to identify stressors on Marlborough Sounds recreational finfish and shellfish recruitment and stocks"

And

"Recognise the very high amenity value of recreational finfish and shellfish stocks when assessing adverse effects of other activities in the coastal marine area"

5.9 Objective 13.5

5.9.1 We **agree** with this objective and the general direction of Policies 13.5.1 to 13.5.9. It is important that the Marlborough Sounds is protected from unrestricted development so that the very values that make the coastal environment of the Marlborough Sounds special can be maintained or enhanced.

5.10 Policy 13.6.1

5.10.1 We **support** the policies for mooring management set out in Policy 13.6.1

5.11 Policies 13.7.1 and 13.7.2

5.11.1 We **support** the policies on anchoring set out in 13.7.1 and 13.7.2

5.12 Policies 13.9.1 to 13.9.8

5.12.1 We **support** the general thrust of Policies 13.9.1 to 13.9.8 on moorings.

5.13 Policy 13.13.6

5.13.1 We **support** Policy 13.13.6. However, it should be **amended** to include extraordinary storm surge events as well as floods.

5.14 Policies 13.14.1 to 13.14.3

5.14.1 We **support** these policies, especially paragraph 13.14.3(d) as it relates to the jetties at Waitaria Bay, Portage, Torea Bay, Te Mahia and Onahau Bay. These jetties provide important transportation links to residents and visitors to the Kenepuru and Central Sounds areas.

5.15 Objective 13.15

5.15.1 Subject to our comment below, we **agree** with this objective and with Policies 13.15.1 to 13.15.3.

5.15.2 It is clearly important that structures in the coastal marine environment do not materially impede or inhibit navigation. For example, structures should not be placed in areas where they will force regular vessel navigation out to a less direct route or down to a reduced speed to meet navigational safety standards. Note that under maritime law vessels cannot travel faster than 5 knots within 200 meters of any structure. There is no policy directed at this.

5.15.3 As such, **we submit** that the following paragraph be added to Policy 13.15.2:

"avoiding activities and/or locating structures that may impede on or inhibit regular navigation paths"

5.16 Issue 13I and Objective 13.16

5.16.1 There are concerns held with the size and displacement of some vessels and the speed and wave action created in the Pelorus and Kenepuru Sound. As such, we **submit** that Issue 13I and Objective 13.16 **be extended** to include all enclosed areas of the Marlborough Sounds.

5.17 Issue 13J and Objective 13.17

5.17.1 We **support** the efficient operation of the ports and the general thrust of policies 13.17.1 to 13.17.11.

The Kenepuru and Central Sounds Residents' Association would like the opportunity to appear and be represented at the MEP hearings.

Yours sincerely

Ross Withell
President
Kenepuru and Central Sounds Residents' Association
c/- 2725 Kenepuru Road, RD 2, Picton 7282
Email president@kcsra.org.nz

APPENDIX A

Marlborough Environment Plan

Review of Landscape & Natural Character Chapters, Landscape and Natural Character Overlays, & Boffa Miskell Ltd Landscape & Natural Character Studies

Dr Michael Steven
20th August 2016

DR MICHAEL STEVEN
Landscape Architect | Landscape Planner
Making Sense of the Land

Marlborough District Council
Proposed Marlborough Environment Plan

Review of Landscape & Natural Character Chapters, Landscape and Natural Character Overlays, & Boffa Miskell Ltd Landscape & Natural Character Studies

Prepared for:

Friends of Nelson Haven and Tasman Bay &
Kenepuru and Central Sounds Residents Association

Prepared by:

Dr Michael Steven
Landscape Architect | Landscape Planner

20 August 2016

PO Box 314 Takaka, 7142 NEW ZEALAND
Tel: 03 525 6044 | Mobile: 027 635 7429
Email: michaelstevenltd@xtra.co.nz

INTRODUCTION

1. Friends of Nelson Haven and Tasman Bay Incorporated and Kenepuru and Central Sounds Residents Association (the clients) have sought professional landscape planning advice in support of submissions on the Marlborough District Council's Proposed Marlborough Environment Plan (MEP).

2. This report has been prepared following a review of the Natural Character and Landscape chapters of the MEP, and the natural character and landscape overlays to the planning maps. I have also undertaken a review of the landscape and coastal natural character studies undertaken by Boffa Miskell Ltd. These studies informed the natural character and landscape overlays of the planning maps.

3. Due to the particular concerns of the client, my review has focussed on natural character and landscape matters as they relate to the coastal environment and landscapes of the Marlborough Sounds, rather than the Marlborough District as a whole.

GENERAL ISSUES

4. The principal focus of this report is the adequacy of landscape assessment and policy making as these processes apply to the Marlborough Sounds, post-the Supreme Court's NZ King Salmon (NZKS) decision.

5. The NZKS Supreme Court decision has significant implications for landscape assessment practise and plan preparation. In particular, the decision has served to:

    5.1. Identify the need for greater rigour in landscape assessment, such that assessments of coastal natural character (in the context of New Zealand Coastal Policy Statement (NZCPS) Policy 13), and landscape significance (in the context of NZCPS Policy 15) are valid and reliable, and in the judgement of the community, credible or plausible. The threshold for what constitutes 'outstandingness' (in the sense of outstanding natural features and landscapes) has not been raised, but rather the bar has been raised on what should constitute a robust method of assessment.

    5.2. Identify the need for precise, critical use of language in the preparation of statutory documents, such as regional and district plans and policy statements.

6. These matters are thrown into sharp focus within the Marlborough Sounds (the Sounds), given that the Sounds was the location of the NZKS proposal, and is an area subject to considerable ongoing development pressure for marine farming applications.

7. The Supreme Court's decision on the meaning of the word 'avoid', as it appears in NZCPS Policies 13 and 15, when used with respect to development in areas of outstanding natural features and landscapes and outstanding natural character, creates professional obligations on part of assessors and policy makers. Significant developments may stand or fall on

the basis for the findings of landscape and natural character assessments, and the consequent writing of planning objectives and policies. Equally, the protection of outstanding natural landscapes and features, and the preservation of coastal natural character within one of New Zealand's most remarkable coastal environments is dependent upon those same assessment methods and approaches to planning.

8. The imperative for valid, reliable and technically robust methods of landscape assessment has risen above and beyond the potential for present landscape and natural character assessment methods and techniques to satisfy. The development and application of more valid and reliable methods are as important for protection and preservation as for development.

9. It is over 15 years since the Pigeon Bay and WESI Environment Court decisions[1] that gave recognition to what have become known as the Pigeon Bay factors (PBF), yet landscape assessment theory and practice has advanced very little in that time. Contrary to what appears to be conventional professional opinion, the Pigeon Bay factors do not constitute a method of assessment, and very little professional thought appears to have been directed at defining a method of assessment into which these factors might fit.

10. The assessment of natural character has been fraught with irreconcilable professional differences of opinion regarding the definition of natural character. The professional failure to advance methods of natural character assessment post-New Zealand Coastal Policy Statement (2010) has been confounded by differing professional interpretations of Policies 13 & 15, particularly with regard to the definition of such fundamental terms as natural character, landscape and feature, and how outstanding is to be understood in the context of outstanding natural features and landscapes, and outstanding natural character.

11. In the absence of sound definitions and valid, reliable and robust methods of assessment, landscape and natural character assessments have taken on the characteristics of an opaque 'dark art', rather than a transparent professional, expert methodology.

Differentiating landscape and natural character

12. An example of these problems, and one of particular relevance to the MEP, is the failure to adequately differentiate the concepts of landscape and natural character in assessments. NZCPS Policy 13.2(a-h) clearly states that there is a distinction:

> Recognise that **natural character is not the same as natural features and landscapes or amenity values** and may include matters such as:

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[1] The Pigeon Bay factors have their origin in a set of factors for landscape assessment originally identified in the Canterbury Regional Landscape Study (Boffa Miskell Ltd and Lucas Associates (1999)), then accepted as factors for the assessment of landscape in *Pigeon Bay Aquaculture Ltd v Canterbury Regional Council* (C32/99) at paragraph [56]. These factors were later modified in *Wakatipu Environmental Society Incorporated v Queenstown Lakes District Council* (C180/99) at paragraph [80].

> (a) natural elements, processes and patterns;
> (b) biophysical, ecological, geological and geomorphological aspects;
> (c) natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks;
> (d) the natural movement of water and sediment;
> (e) the natural darkness of the night sky;
> (f) places or areas that are wild or scenic;
> (g) a range of natural character from pristine to modified; and
> (h) experiential attributes, including the sounds and smell of the sea; and their context or setting.

9. The statement; "…natural character is not the same as natural features and landscapes or amenity values…" should force some critical consideration of the concepts for the purposes of determining a working definition of the concept. A robust investigation into any phenomenon cannot proceed in the absence of a valid definition of the phenomenon to be investigated. Yet the *Landscape Meaning and Marlborough's Statutory Context* section (p.15) of the Boffa Miskell Marlborough Landscape Study begins with the unhelpful statement:

> The Environment Court has commented that "A precise definition of 'landscape' cannot be given ..." [WESI vs QLDC [2000] NZRMA 59].

10. Given the state of RMA-based landscape assessment practice in 2000, this may have been an understandable statement for the Court to make. However, in my opinion, 16 further years of landscape assessment practice should have brought members of the landscape profession closer to an understanding of the phenomenon they are assessing when undertaking landscape assessments. There is no clear indication from the BML landscape study that this is the case.

11. What is required is a valid, unambiguous operational definition for the purposes of undertaking landscape assessments in response to section 6(b) and NZCPS Policy 15. The IFLA[2] Asia-Pacific Region Landscape Charter, to which the NZILA is a signatory, provides such a definition. It is the same definition adopted by the European Landscape Convention. Landscape is defined as:

> An area, as perceived by people, whose character is the cumulative result of the action and interaction of natural and/or cultural factors.

12. The Boffa Miskell (June 2014) study, *Natural Character of the Marlborough Coast* is scarcely more definitive on the matter of defining natural character. Despite a 2 page discussion (pp.13-14) no clear, unambiguous operational definition is offered.

13. The failure of assessors to articulate and operationalise the differences between landscape and natural character by way of valid and unambiguous definitions is a significant flaw in the Boffa Miskell MDC landscape and natural

[2] International Federation of Landscape Architects

character assessments. Problems arising from this flaw are consequently apparent in the landscape and natural character overlay maps of the MEP.

14. The failure to clearly differentiate natural character from landscape is evident in the way in which the italicised word in the Policy 13.2 are generally interpreted:

> Recognise that natural character is not the same as natural features and landscapes or amenity values and *may include matters such as*:

15. The phrase "…*may include matters such as*…", is interpreted as prescriptive, as if all the matters 13.2(a)-(h) are mandatory for the assessment of natural character ratings. This is evident in MEP Chapter 6, where Policy 6.1.1 states:

> **Policy 6.1.1** – Recognise that the following natural elements, patterns, processes and experiential qualities contribute to natural character:
>
> (a) areas or water bodies in their natural state or close to their natural state;
> (b) coastal or freshwater landforms and landscapes (including seascape);
> (c) coastal or freshwater physical processes (including the natural movement of water and sediments);
> (d) biodiversity (including individual indigenous species, their habitats and communities they form);
> (e) biological processes and patterns;
> (f) water flows and levels and water quality; and
> (g) the experience of the above elements, patterns and processes, including unmodified, scenic and wilderness qualities.
>
> This policy describes those matters considered to contribute to the natural character of coastal and river environments. This provides MEP users with a clear understanding of the meaning of natural character.

16. The addition of matter (g) in Policy 6.1.1 (*the experience of the above elements, patterns and processes, including unmodified, scenic and wilderness qualities*) serves to expand the notion of natural character to a concept barely indistinguishable from landscape. All matters listed in NZCPS 13.2(a)-(h) are as applicable to the assessment of ONFL, as to natural character. Several matters relate directly to amenity. Not all are applicable to the rating of natural character, yet assessors assume that to be the case.

17. It is clear that at a professional level (assessors, policy makers) insufficient analysis and critical thinking has been applied to the problem of differentiating the concepts.

18. As a consequence, I expect that from a community perspective, the Boffa Miskell natural character assessments and landscape assessments will appear to have assessed the same phenomena. Contrary to MEP Policy 6.1.1, the manner in which natural character has been assessed does not provide MEP users with a clear understanding of the meaning of natural character.

How should the community evaluate landscape and natural character assessments?

19. There is a sound methodological basis - a series of tests - for evaluating landscape and natural character assessments, such as the Boffa Miskell studies undertaken for the purposes of the MEP. The approach is set out in a paper by Swaffield and Foster (2000)[3]. In simple terms, the tests ask: Are the findings of the Boffa Miskell studies that have informed the identification of the outstanding natural landscapes and features, and the natural character of the coastal environment of the Marlborough Sounds credible? Or, in other words, do the findings 'ring true' with everyday experience?

20. At the level of a professional evaluation of the Boffa Miskell assessments, two key criteria can be applied to assessing the credibility, or 'truth value' of the assessments in question: a test of validity, and a test of reliability:

    20.1. *Validity* is a test of whether a method measures the quality or attribute it claims to measure. Validity can be understood in terms of the constructs/concepts used, and of the resulting assessment. In terms of assessments of natural character, validity refers to (i) the validity of the definition of the construct itself, and (ii) how well the construct has been operationalised in the field, i.e., whether the methods applied actually measure the phenomenon they purport to measure.

    20.2. *Reliability* is a test of consistency, and is concerned with whether different methods will produce the same findings when measuring the same phenomena in different contexts. Citing Daniel & Vining (1983), Swaffield and Foster (2000) note: "methods such as expert evaluation are of questionable reliability, in that a range of experts are likely to evaluate the same phenomena differently. Even an individual expert will make different judgements at different times."

21. The validity of the Boffa Miskell Marlborough coastal natural character and landscape assessments is questionable from the start, owing to the failure of either study to clearly define the fundamental concepts that are being investigated.

22. From perspective of the community, validity and reliability can be approached from the simple concept of credibility, or plausibility. Do the findings of the BML studies offer the reader a plausible explanation for the phenomena under investigation (natural character, ONFL).

23. Plausibility cannot exist in work which lacks 'truth value' and consistency.

    23.1. Truth value - do the findings reflect experience of the community?

    23.2. Consistency - are similar areas assessed the same? Consistency can also be understood as dependability - can the findings be relied upon?

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[3] Swaffield, S.R. and R.J.Foster (2000), *Community perceptions of landscape values in the South Island high country: A literature review of current knowledge and evaluation of survey methods.* Science for Conservation Publication 159, Department of Conservation.

24. In my opinion, the Boffa Miskell studies of landscape and natural character of the Marlborough Sounds are neither credible nor plausible accounts of landscape value and natural character.

25. An analysis of the landscape and natural character overlays to the MEP planning maps reveals several aspects that are implausible, or not credible. Problems with the overlay maps - and the studies that informed them - may be attributed to:

    25.1. Invalid definition of natural character

    25.2. Reference to inappropriate or irrelevant assessment factors

    25.3. Invalid distinctions between landscapes and features

    25.4. Inconsistent treatment of seascapes as part of landscapes

    25.5. Inconsistency of application - glaring inconsistencies with no apparent justification.

26. I address each of these problems in the following sections of this report.

HOW TO UNDERSTAND NATURAL CHARACTER

27. As noted, fundamental flaw of the Marlborough Coastal Natural Character study is the absence of a clear, unambiguous definition of natural character - an awareness of what it is, and what it is not. In my opinion, the following simple definition is valid, and has sufficient utility for the purposes of RMA section 6(a) and NZCPS Policy 13:

> Natural character is the expression of natural elements, natural patterns and natural processes in the landscape or coastal environment, rated according to the degree of modification through human agency.

28. By this definition. natural character must be understood as a condition, or state of the coastal environment, assessed with reference to how much or how little human modification to natural elements, natural patterns and natural processes is evident.

29. Natural character is an aspect of the broader concept of landscape character - characteristic by which the coastal environment can be described and rated according to whether it is the product of natural process, or human influenced processes and ongoing management.

    29.1. The assessment is of natural character is concerned with identifying how much, or how little of that characteristic is exhibited in areas of the coastal environment.

    29.2. Natural character assessment is not an evaluative process. The RMA and NZCPS establish the value of natural character, so the purpose of assessment is not to attribute value. The purpose is to inventory how

much - or how little - natural character exists in a given area of the coastal environment, according to a scale of reference.

29.3. The only valid attributes for the assessment of natural character are those that derive directly from the definition above: *expressions of natural elements, natural patterns and natural processes*. There is nothing more.

30. It is generally accepted now that natural character may be rated with reference to a 7-range scale:

Figure 1: 7-point scale of naturalness for the assessment of the degree of natural character exhibited by a landscape or the coastal environment. The shaded part of the scale is the range within which natural processes become dominant over cultural processes, and represents the range within which a feature or landscape may be regarded as natural enough for s6(b) purposes. Landscape assessed as being within the Moderate range of the scale will generally display natural and cultural influences in equal measure. From Moderate-Low to Very Low, there is an increasing dominance of cultural elements, patterns and processes over natural influences.

31. The matters listed in NZCPS 13.2(a)-(h) are relevant to different aspects of natural character and its assessment. It is important to understand which matters are are to be applied to the task of assessing levels of natural character in the field:

31.1. Some matters are relevant to defining inland extent of the coastal environment ("context and setting")

31.2. Other matters - (a)-(e) - are relevant to assessing levels of natural character. Generally, these factors refer to objectively verifiable aspects of natural character, and it is the application of such factors that contribute to the reliability of a robust assessment method.

31.3. Matter (g) addresses the application of a scale (as above) for rating natural character levels of some areas relative to others.

31.4. Matters (f) and (h), which refer to 'places or areas that are wild or scenic' and 'experiential' qualities require critical analysis:

32. Matters (f) and (h) have more to do with the appreciation of natural character - what goes on in the head rather than in the environment. Levels of natural character *cannot be determined* with respect to wild, scenic or experiential

qualities. These aspects are not determinants of natural character, but rather the outcome, or result of the experience of natural character.

33. The admission of an as yet undefined range of experiential factors or attributes to the assessment of natural character could lead to the possibility that an objectively verifiable natural character rating for an area of the coastal environment (say, high) could be reduced to the next level down (moderate-high) on the spurious grounds that the area is assessed as insufficiently wild or scenic, or lacks other attributes such as the sound or smell of the sea[4]. If it were to be argued that experiential attributes could not diminish a natural character rating, then it must be equally true that such attributes cannot increase a natural character rating. In which case, the factors 13(2) (f) and (h) are completely redundant and there is no need for them to be assessed at all.

34. The flawed application of 'experiential' attributes to the assessment of natural character has compromised the concept of natural character to the point where it is almost indistinguishable from landscape and amenity assessments. This has had significant consequences for natural character assessments:

    34.1. Assessments frameworks lack transparency as poorly defined irrelevant aspects (i.e., scenic or aesthetic qualities) are admitted to the assessment framework. The specific factors considered in the assessment of experiential attributes are largely unstated, as is the manner in which they are rated.

    34.2. The potential exists for the subjective assessment of experiential factors to colour or cloud the objective analysis of natural character.

    34.3. The mapping of natural character lacks credibility and consistency (see maps reproduced later in this report), as demarcation lines between differently rated areas are inexplicable by any objective analysis.

    34.4. The confused and incorrect use of language/terminology, particularly frequent reference to 'values' in different contexts ('natural values', 'perceived naturalness values', 'experiential values') both in the Boffa Miskell natural character report and in the MEP discussion on natural character (Chapter 6). As noted earlier, natural character assessment is a descriptive as opposed to an evaluative exercise, and the identification of values is not a valid part of the process.

35. Given the level of ambiguity and confusion concerning the definition of natural character it is not surprising that the concept of outstanding natural character (ONC) should be equally confused. It is defined in the MEP (Chapter 6, p.5) as:

> *...those areas of the coastal environment that have* ***very high natural character*** *and which also exhibit a combination of natural elements, patterns and processes that are exceptional in their extent, intactness,*

[4] How the sound and smell of the sea can be applied to the rating of natural character according to the accepted 7-range scale has never been addressed.

> *integrity and lack of built structures (and other modifications) compared to other areas in Marlborough, are identified as having outstanding coastal natural character*. [emphasis added]

36. A reasonable interpretation of this explanation is that ONC exists at the upper end of the Very High range of the natural character scale, as illustrated in the following Figure 2:

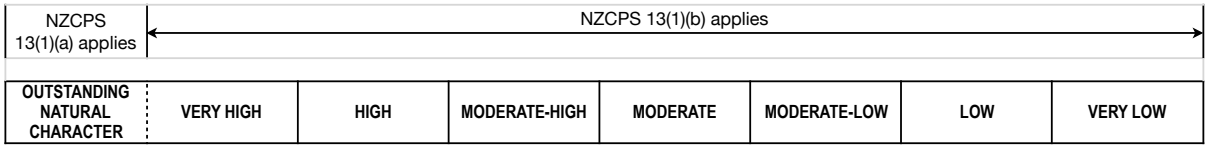

Figure 2: One approach to ONC assessment: Outstanding Natural Character may be understood as natural character considered as being at the extreme end of the Very High range of the scale, i.e. natural character approaching 'pristine' levels. It is generally accepted that pristine natural character, in the narrowest sense of the term, no longer exists, as all environments in NZ are to a degree, influenced by human agency.

37. However, this understanding of ONC is contradicted by the discussion in the Boffa Miskell coastal natural character study (p.28), which attributes ONC to areas with high or very high levels of natural character:

> An area with outstanding natural character may be an area within the coastal environment that is considered to have high or very high levels of natural character, although it is important to note that the high or very high ratings do not in themselves equate to 'outstanding'

38. The question might be asked then, what takes some areas rated high and very high to the level of outstanding, but not others?

39. The discussion continues (p.28):

> **'Outstanding'** is a comparative evaluative term meaning; to stand out, exceptional, pre-eminent.
>
> It was determined by the study team that outstanding natural character should be assessed separately from the main assessment which determines areas holding very low to very high levels of natural character. It was also determined that outstanding natural character assessments should combine both terrestrial and marine components so that important sequences of ecological naturalness (such as from the top of a ridge above sea level to the bottom of the adjacent sea and interconnected systems) are considered.
>
> An assessment to establish whether all or parts of a coastal area contain outstanding natural character needs only be undertaken when **all** of the attributes, when appraised at an adequate scale (in this case Level 4 & 5) and using adequate data, are assessed as being of *'high'* or *'very high'* levels of natural character for the actual part to be identified as outstanding natural character.

> Under the methodology an area of **outstanding natural character** (ONC) must:
>
> > 'exhibit a combination of natural elements, patterns and processes that are exceptional in their extent, intactness, integrity and lack of built structures (the 'clutter' factor) and other modifications compared to other areas in the Marlborough Region'.

40. This discussion appears to adopt a different understanding of ONC than the definition given in the MEP. Of particular note is the statement that both high and very high rated areas may qualify for ONC status, but that ONC must combine both terrestrial and marine components of the coastal environment.

41. The differences between the Boffa Miskell explanation and the MEP explanation is not resolved by way of further explanation in the MEP, and an inspection of the natural character overlay map for the Sounds further confounds any understanding of what has been done, and how it has been done. Areas of high and very high natural character have been found to be ONC, yet other areas of high and very high natural character have not. The boundaries between areas classified high/very high/ONC and areas with no classification show no logic or rationale.

42. The rationale behind the identification of ONC is poorly explained, and this is in large part owing to the failure to offer a succinct and valid definition of ONC in the first place. The Boffa Miskell study offers the explanation that the critical factors that take an area of the coastal environment from high or very high to ONC are "… natural elements, patterns and processes that are exceptional in their extent, intactness, integrity and lack of built structures (and other modifications)". These are what, by any reasonable analysis, would rate an area as very high in the first place, and certainly no area with these "exceptional" characteristics would rate as high. Why the natural character of some areas identified as high, or very high is considered ONC, but other areas of very high are not, is not explained. The failure of the assessment to treat like areas the same indicates the assessment fails the test of reliability.

43. The analysis is neither credible nor plausible in my opinion, and this problem can be attributed to the fact that the definition of the concept (ONC) is not valid, and the method applied to its assessment is neither valid nor reliable.

44. Given the weight the ONC concept carries in a post-NZ King Salmon planning environment, a valid definition of outstanding natural character is required, and a valid, reliable and robust method for its application,

LANDSCAPE, SEASCAPES AND FEATURES

Landscape and seascape

45. As with the natural character assessment, the failure to clearly define what is meant by landscapes, seascapes and features has implications for the validity, reliability and plausibility of the BML and the identification of outstanding natural features and landscapes (ONFL) in the MEP.

46. As proposed earlier in this report, a simple, widely accepted definition (European Landscape Charter, Asia-Pacific Landscape Convention, to which NZILA is a signatory) refers to landscape as:

> *An area, as perceived by people, whose character is the cumulative result of the action and interaction of natural and/or cultural factors.*

47. A feature can be understood as a discrete, distinctive or characteristic component of a landscape. Usually defined in a topographical sense, and thus possessing well defined boundaries, a feature is the finest level of analysis at which landscape can be considered for s6(b) assessments.

48. It is implicit in NZCPS Policy 15 that landscapes include seascapes:

> **Policy 15 Natural features and natural landscapes**
> To protect the natural features and natural landscapes (**including seascapes**) of the coastal environment from inappropriate subdivision, use, and development: [emphasis added]

49. The identification and assessment of seascapes is a relatively new procedure in RMA-based landscape assessment practice, and the process has its statutory basis in NZCPS Policy 15. The NZCPS does not define the term seascape, as a necessary first step, as with other assessment processes, is to define the term. The BML landscape study (p.20) defines seascape with reference to UK practice:

> "Landscapes with views of the coast or seas, and coasts and the adjacent marine environment" (Landscape Institute/ IEMA 2013, p17)[5] and
>
> "An area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/ or human factors" (Natural England 2012, p8)
>
> This Landscape Study identifies seascapes that contribute significantly to the experience of an adjacent outstanding natural landscape. The seascapes identified in this Study form vistas that are imbued with biophysical, sensory and associative qualities that are outstanding in their own right. These seascapes have had limited modification; although in some instances seascapes with development (such as jetties, marine farms and moorings) were incorporated, knowingly, where the development was at a scale that did not detract significantly from the outstanding qualities of the seascape surrounding.

50. While the UK definitions are acceptable for the purpose of the marlborough study, the manner in which the concept has been applied is on my opinion, problematic. As stated in the excerpt of the BML landscape study quoted above, seascapes are identified where they:

> ...contribute significantly to the experience of an adjacent outstanding natural landscape.

[5] The full definition given on p.16 of the GLVIA3 document (cited as Landscape Institute/ IEMA 2013) is: "...seascape should be taken as meaning landscapes with views of the coast of seas, and coasts and the adjacent marine environment with cultural, historical and archaeological links with each other."

51. This implies that outstanding natural landscapes are considered first, and seascapes are only identified as outstanding where they contribute to the experience of those ONLs. In my opinion, this does not adopt the holistic conceptualisation of landscape and seascape as a single entity that is required by NZCPS Policy 15, nor indeed is the approach taken by the BML study consistent with the definition of escape given in the study and cited above. The definition cited by the BML study requires that the consideration of seascapes goes well beyond contributions to the experience of an adjacent ONL.

52. Some further explanation of the basis for defining seascapes is given in the explanatory text *Mapping of Features and Landscapes, Seascape Approach (*Diagram 6, p.21):

> Whilst the land based ONFLs are mapped using approaches 1-5, **the extent of seascape ONFLs have been determined predominately by the marine component of the coastal natural character study 2014**. This captures the land/sea interface, where information of marine based-values is generally the greatest. Refer to Appendix 6 of *Natural Character of the Marlborough Coast* [Boffa Miskell et al, 2014] for further explanation. Other landscape factors have also been considered in determining this mapping approach. [emphasis added]

53. The apparent reliance upon the coastal natural character study for the identification of seascapes reveals a fundamental lack of understanding of the distinction between the concepts 'natural character' of the coastal environment, and landscape/seascape. This approach is also problematic given the differing thresholds that apply to the assessment of natural character for the purposes of the *Natural Character of the Marlborough Coast Study,* and the identification of ONL*:*

    53.1. The BML natural character study, and the MEP overlay, maps natural character within the range of high - very high, and outstanding

    53.2. As reference to the scale of natural character included earlier in this report, the threshold of natural character required for the identification of ONFL begins within the moderate range of the scale, but certainly includes any landscape/seascape assessed as being moderate-high in natural character. The BML natural character study does not identify any landscape/seascape at this level - unless of course it can be assumed (and with some justification) that all areas not otherwise shown as high or very high are indeed moderate or moderate-high).

54. The reliance of the landscape study on the coastal natural character study for the identification of natural character thresholds for ONL, in circumstances in which the natural character study does not recognise and map levels of natural character below high, is a flawed approach to the identification of seascapes as part of ONL within the inner Sounds.

55. Within any part of the Marlborough Sounds it is reasonable to understand any landscape as incorporating adjacent seascapes. I consider it would be common ground within the community that, within the Sounds, landscape and seascape combine to form a perceptual whole. As such, and with regard

to the definition of landscape/seascape given above, it is reasonable to expect an assessment to identify multiple outstanding natural landscapes within the Sounds, that in each case incorporate landscape and seascape within the area so defined as ONL.

56. In is a matter of some concern, therefore, that with the exception of the Outer Sounds ONL, there does not appear to be a single area of outstanding natural landscape identified within the Sounds. Such area as are recognised as outstanding are all classified as features, as distinct from landscapes. This has significant implications for the extent to which the MEP gives effect to the NZCP, which I shall explain later in the next sections this report.

57. The absence of ONL within the inner Sounds is explained (BML Marlborough Landscape Study p.106) as follows:

> At a national scale, the Marlborough Sounds is perceived as one landscape - identified in this report as the Marlborough Sounds Coastal Landscape. At the regional/district scale, the Marlborough Sounds has two distinctive character units, namely the Inner Sounds Landscape and Outer Sounds Landscape.
>
> ...
>
> Within the Inner Sounds Landscape Unit there are no identified Outstanding Natural Landscapes, principally due to the small scale of this character unit. The Inner Sounds Character Unit does, however, contain Outstanding Natural Features.

58. The reference to the Marlborough Sounds being perceived as one landscape at a national scale is irrelevant - a national landscape assessment has never been undertaken. The notion of the Sounds in their entirety as being a single landscape is also inconsistent with the definition of landscape given in this report - from what position in space can the Sounds be perceived as a single landscape? Then to suggest that the Sounds can be regarded as just two landscapes at the District level - an inner and outer Sounds landscape, also is not a plausible explanation in my opinion. To equate character units with landscapes, as the text quoted above does, is also to repeat a common misunderstanding in landscape assessment practice; that landscapes and landscape character area (or units) are one and the same thing.

59. I consider the manner in which the concepts of landscapes and features have been understood and operationalised in the Boffa Miskell Marlborough Landscape Study displays a considerable degree of conceptual confusion concerning the distinction between these concepts.

Features

60. The lack of conceptual clarity regarding what constitutes a feature, and what is a landscape/seascape is evident in the BML landscape study findings, in that with the exception of the Outer Sounds ONL, no outstanding natural landscapes are identified anywhere within the Marlborough Sounds. Rather, multiple outstanding natural features (ONF) are identified. In some cases these

ONF do include large tracts of seascape (CMA), in contexts in which it would be more appropriate to regard the areas as landscapes.

61. Conceptual confusion over what is a feature and what is a landscape is evident throughout the BML landscape assessment, and not just within the Sounds:

    61.1. The Bryant and Richmond Range area is identified as ONL

    61.2. The Chalk Range is identified as an ONF

    61.3. The Inland Kaikoura Range is identified as an ONF

62. These classifications suggest some confusion, or at the very least inconsistency, in the application of the concepts of features and landscapes to the delineation of outstanding areas of land.

63. Features are defined in the Boffa Miskell landscape study (p.20) in the following terms:

> **Landscape features** are discrete elements within a landscape, which are generally experienced from outside the features' boundaries. Features display integrity as a whole element and can often be clearly distinguished from the surrounding landscape. Generally, features are defined by their geomorphological landform boundaries. However, in some instances (such as areas of native bush) features are defined more readily by land cover characteristics.
>
> The identification of both landscapes and features is scale-dependent, e.g. the whole of the Marlborough Sounds could be identified as a feature when seen as a whole from a satellite aerial view (regional scale), while landscapes, such as Tennyson Inlet, and features, such as islands, bays or peninsulas, occur within it when perceived from within. Therefore, small landscapes can nest within larger landscapes.

64. While I accept that, as a very general principle, the identification of features is scale dependent, the reliance upon satellite imagery as the basis for identifying the Marlborough Sounds as a feature is a spurious and irrelevant example of how scale is to be understood in the context of landscape assessment. An aspect of the definition of landscape given above applies equally well to features; "an area, as perceived by people". It is the experience of the viewer, on the ground that is the most reliable reference to the identification of both landscapes and features.

65. I accept that features are discrete elements within a landscape. However, the identification of the Inland Kaikoura Range as a feature raises the question of what landscape it is legitimately a part of, and at what scale of analysis could one possibly regard that landscape as an area, perceived by people. In my opinion the scale of the Inland Kaikoura Ranges is inconsistent with common understandings of what constitutes a feature in RMA section 6(b) and NZCPS Policy 15 terms.

66. While the distinction between feature and landscapes within terrestrial environments may be considered largely semantic with no significant practical considerations, within the coastal environment it is a significant issue:

    66.1. A feature within the Sounds would not, by definition, include the adjacent seascape, defined as a feature is, largely by its geomorphological form.

    66.2. A landscape within the Sounds must, in my opinion, include adjacent seascapes.

67. By analysing and assessing the Marlborough Sounds as a collection of features, the BML landscape study has, generally, with the exception of Tennyson Inlet, failed to give ONL standing to any part of the inner Sounds marine environment. This is not plausible or credible, in my opinion. Even the definition of Tennyson inlet appears confused - in the definition of feature quoted above, Tennyson Inlet is referred to as a landscape, while elsewhere (p.124) it is referred to as a feature: Area 9, Tennyson Inlet and Northern Nydia Bay.

Identifying outstanding natural landscapes: 'top down' (landscape) v 'bottom up' (values) approaches

68. As stated already in this report, landscape assessment methods begin with the definition of the concept to be investigated. Landscape has been defined as:

> An area, **as perceived by people**, whose character is the cumulative result of the action and interaction of natural and/or cultural factors.

69. For the purpose of delineating the spatial extent of a landscape, the relevant words in the definition are; "…as perceived by people"

70. This is consistent with the general understanding of what constitutes a landscape in a RMA section 6(b) sense, as given by the Environment Court in *KPF Investments ltd v Marlborough District Council*[6], at [52]:

> We hold that the word "landscape" is being used in section 6(b) primarily in the picturesque sense of **an area that can be seen at a glance**.

71. This explanation as to the intended meaning of landscape is consistent with that given above, but also with a range of other accepted definitions, including:

> Landscape is not synonymous with environment, **it is the environment perceived**, especially visually perceived' (Appleton, J. 1980. Landscape in the Arts and the Sciences. University of Hull, Yorkshire)

> Usually a landscape is that portion of land or territory which **the eye can comprehend in a single view**, including all its natural characteristics. (Steiner, F. 1991. The Living Landscape: An Ecological Approach to Landscape Planning. McGraw Hill. New York)

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6 [2014] NZEnvC 152

> Landscape is the assemblage of human and natural phenomena contained **within one's field of view** outdoors (Palka, Eugene J. 1995. Coming to grips with the concept of landscape. Landscape Journal, 14(1))

72. As is apparent from the words emphasised in the definitions given above, the notion of landscape as a perceived phenomenon is consistent through all these definitions, and the interpretation given by the court in *KPF Investments.*

73. The implication for landscape assessment for section 6(b) and NZCPS Policy 15 purposes is that the starting point is a landscape as perceived or experienced in the field, experienced in an holistic sense. The top down, or landscape approach (referred to in various decisions of the Environment Court[7], and the High Court's *Man o'War* decision[8]) applies the following stages to assessment:

    73.1. Identify the relevant landscape/s,

    73.2. Determine whether a landscape is a natural landscape, and if so, how natural (with reference to the scale of natural character given above),

    73.3. Assess whether any landscape, as a natural landscape, is also outstanding

74. Landscapes, as they appear to be defined in the BML landscape study, do not appear to have been defined according to this real-world perceptual approach. This has significant implications for the manner in which the spatial extent of ONL are defined.

75. The section *Mapping Landscape Values* (BML Marlborough Landscape Study, pp. 20-21) describes the approach that was taken to the identification of ONL. As described and illustrated (see diagram below). the Boffa Miskell assessment process is based the GIS mapping of landscape 'values', largely by way of desk-based studies. Through the process illustrated diagrammatically in Figure 3, below, outstanding natural landscapes are 'constructed' or contrived from the mapped aggregation of values into areas of highest value density. While ground-truthing may follow GIS analysis for the purpose of refining landscape and feature boundaries, it is my opinion that the process should commence with the real-world experience of landscape, not end with it.

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[7] e.g.:
C15/2009, *Friends of Pelorus Estuary Inc. v Marlborough District Council at* [37]
[2011] NZEnvC 387 *High Country Rosehip Orchards Limited v Mackenzie District Council* at [74]
[2012] NZEnvC *Port Gore Marine farms v Marlborough District Council* at [78]

[8] CIV-2014-404-002064 [2015] NZHC 767 *Man o'War Station Ltd v Auckland Council*, at [10]

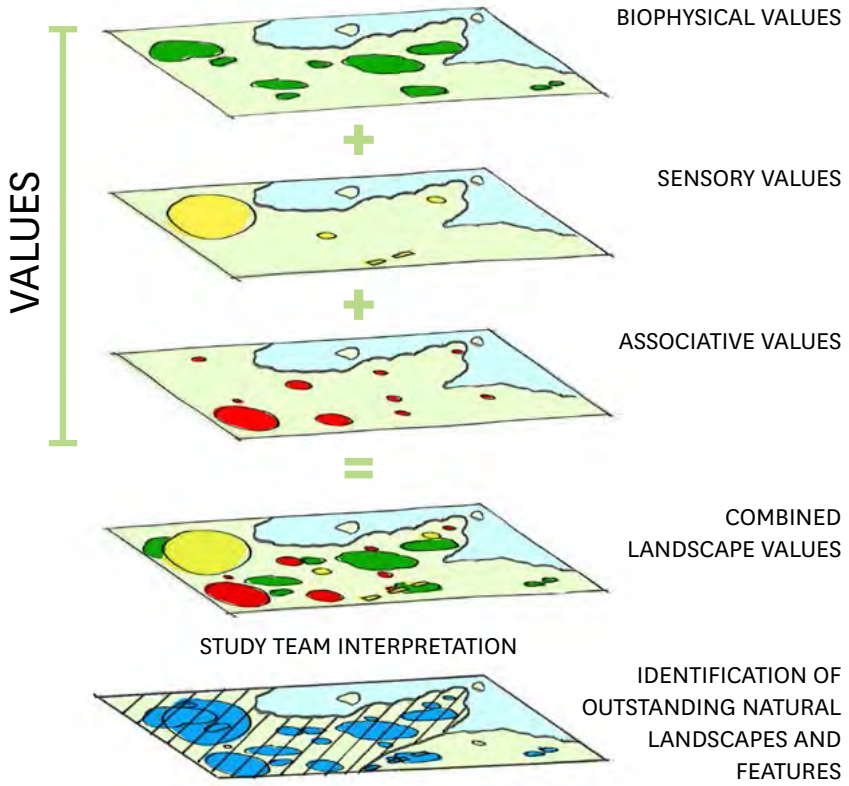

Figure 3: Diagrammatic representation of the GIS-based process applied to the mapping of landscape 'values' and the delineation of ONFL (Source: Boffa Miskell Marlborough Landscape Study (2015), p. 21

76. In my opinion, the 3 stage, top down approach is a more appropriate response to the concept of landscape, as given in the definition above: An area, **as perceived by people**. The top down, or landscape approach begins with the holistic perception of a landscape, then asks the questions; is it a natural landscape, and if a natural landscape, is it outstanding? In my opinion, this approach must begin with the real world perception of landscapes *in the field.*

77. If a top down, landscape approach were undertaken in the case of the Marlborough landscape study, it is my opinion that the spatial composition of landscapes would be markedly different to those identified in the BML report and mapped in the MEP on the basis of a bottom up, values-based approach. The difference is between a landscape, understood as an area perceived by people, as distinct from a landscape defined by the computer-based analysis of values distribution.

High Amenity Landscape

78. The concept of High Amenity Landscapes (HAL) is introduced on p.167 of the BML landscape study, from which the following passages of text have been selected :

> As outlined within Section A of this study, landscapes and features that do not reach the threshold of being determined an ONF or ONL but that hold high amenity and environmental characteristics and values are determined as Landscapes and Features with High Amenity within this report.
>
> ...
>
> The amenity and environmental quality focus of these investigations has been visual amenity. The study team has addressed the important visual amenity features or characteristics that occur outside the areas identified as outstanding.
>
> ...
>
> For the Marlborough Sounds, it was confirmed through the consultation period that the entire area should be a 'significant landscape' under Section 7 of the RMA, and that within this landscape, there are numerous Outstanding Natural Landscapes and Features that 'nest' within it.

79. The first paragraph quoted above adopts the conventional practice in RMA-based landscape assessment of attributing amenity value (sometimes referred to as Visual Amenity Value, of VAL) to landscapes that fall below the significance threshold for being classified as ONFL.

80. What follows however, appears to be justification for identifying the entire Marlborough Sounds, including ONL and ONF as being a High Amenity Landscape as well. However, the justification for a further overlay over and above the ONFL overlay is difficult to understand. The matter is complicated further by the fact that the ONFL and High Amenity overlays cover significant areas of the Sounds that are also subject the coastal natural character overlay.

81. As the same factors that are used for the identification of ONFL are also used (but with a lower threshold) for the identification of HAL, and as these factors are scarcely indistinguishable from the factors used for the identification of natural character (particularly given the consideration of ‘experiential’ factors in natural character assessments, there would appear to be a significant level of ‘double dipping’ and redundancy evident in the extent of the MEP natural character and landscape overlays. From the lay community viewpoint, I would find it almost impossible to differentiate the characteristics and qualities that are addressed in each overlay.

82. I am unable to see the policy advantages of the double classification. As HAL were assessed as being those landscapes that fell short of the threshold for outstanding classification, it is reasonable to understand that all areas of

ONFL also have high amenity (by definition), and the overlay is redundant insofar as it covers areas of ONFL.

83. From a pragmatic interpretation point of view, the graphic representation of HAL by cross hatching makes the interpretation of the landscape overlay maps difficult through the introduction of unnecessary graphic 'noise'.

Language and terminology

84. An important aspect of plan preparation to emerge from the NZKS Supreme Court decision is the importance of "…objectives and policies that are clearly expressed and say what they mean"[9].

85. I consider the language and terminology applied in landscape assessment practice and plan drafting to be some of the more obscure and opaque, and with respect to some terms, simply incorrect. A significant consequence is what I understand to be a very high level of confusion in the minds of the community as to the concepts being addressed through landscape and natural character provisions, and how these are to be commonly understood.

86. I regard this as a significant issue with respect to the MEP and its credibility as a planning document, at least insofar as landscape and natural character is concerned. This problem is not aided by the absence from the MEP of key landscape terms from the Definitions section of Volume 2. There is no definition of *landscape, feature, natural character* or *values* (be they natural values, natural character values, associative values, sensory values, experiential values or perceptual values - all terms used in the MEP). The community could be forgiven for a degree of bewilderment or confusion concerning just what is being preserved and protected through landscape and natural character provisions of the plan.

87. The manner in which values are understood and addressed in the Boffa Miskell landscape study raises significant questions as the the validity of the assessment framework, and its credibility from a community perspective. How for instance, is one to understand the concept of "non-visual sensory values' and the contribution they (whatever they are) may take to outstandingness?

88. Given that such everyday terms as erosion, farming, marina and park are defined, it cannot be argued that the terms landscape, natural character and values, for instance, are terms for which there is a common understanding. This problem is aggravated by the absence of any definition of landscape and natural character in the RMA and NZCPS, and the failure of the Boffa Miskell landscape and natural character studies to define these terms.

89. While a failure to define terms that are fundamental to an understanding of the landscape and natural character provisions of the MEP is a significant issue, the erroneous use of some terms creates further confusion and misunderstanding. For example, the term *values* is widely and uncritically

[9] Nolan, D. and J. Gardner Hopkins, (2014) *EDS v New Zealand King Salmon — the implications* Resource Management Journal, November, 2014

misused throughout the Boffa Miskell studies, and within the landscape and natural character provisions of the MEP. Whether used alone, or in association with natural character, experiential, sensory, or perceptual (or in various other combinations), the manner in which values is generally applied is incorrect. Values are not inherent in the biophysical environment, in the landscape, or landscape features, or in the natural attributes of landscape. Values have their origin in shared community or societal beliefs, or professionally informed judgements. Value refers to the 'worth, merit or importance' of something. Values cannot be observed directly but only through their expression in the form of attitudes and behaviours.[10].

90. Throughout chapters 6 and 7 of the MEP, and in Appendix 1 (*Values contributing to areas with outstanding natural features and landscapes and areas with high amenity value*) and Appendix 2 (*Values contributing to high, very high and outstanding coastal natural character*), there are frequent references to 'values' in various combinations with other terms. In all cases the meaning of values in such contexts is obscure, and in no sense do the terms "say what they mean".

91. For landscape evaluation purposes, the aspects to be investigated through the process of landscape assessment, for protection by way of objectives, policies and rules in the MEP, are characteristics and qualities of the environment *that are valued by the community*. For the purposes of s6(b) and NZCPS Policy 15, these characteristics and qualities are attributes of landscapes and landscape features that can be identified and described by the assessor, but their evaluation (the attribution of value) is a separate exercise.

92. The assessment of natural character is a descriptive process and does not require an evaluative stage. It is incorrect to speak of natural character values. The concern of the assessment process is for describing differing expressions of natural elements, natural patterns and natural processes, the extent of modification to these, and then rating these expressions according to whether more or less natural character is apparent. Natural character within the coastal environment is valued at whatever level it is assessed.

93. In the interests of transparency, and a clear and unambiguous community understanding of chapters 6 and 7 and their related appendices, I recommend as follows:

    93.1. The concepts of *landscape, feature,* and *natural character* (at least) should be defined in the Definitions section of the MEP.

    93.2. All references to values, either alone, or when used in association with another term, where the term refers to some aspect of the landscape or environment, should be replaced with characteristic or quality, according to whether the reference is descriptive or evaluative.

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[10]Kellert, S. 1980. *Knowledge, Affection and Basic Attitudes Towards Animals in American Society*. US Government Printing Office: Washington DC, USA.

93.3. Reference to vague and indeterminate characteristics or qualities of the landscape or coastal environment, such as experiential, perceptual, sensory, or associative values values, should be supported by definitions in the MEP, or replaced with plain English equivalents comprehensible to the community. This is particular important in instances where these terms are associated with objectives and policies that provide for protection and preservation.

Aesthetic value

94. The assessment of outstandingness has been conducted with reference to the three broad categories of assessment factors outlined in the NZILA Best Practice guidelines: biophysical aspects, sensory aspects, and associative aspects. These are essentially a reorganising of the Pigeon Bay factors into higher level categories.

95. The label 'sensory aspects' is, in my opinion, a further example of obfuscation through the application of jargon to landscape assessment. In straightforward terms, this category concerns the assessment of aesthetic quality, or aesthetic value. The role of aesthetic quality is acknowledged in the BML landscape study, but rather than being regarded as but one of the sensory aspects assessed, it is, in my opinion, the only relevant aspect. The BML study refers to aesthetic quality in the following context (p.15):

> Sensory aspects, which involve aesthetics, natural beauty, transient matters as well as distinctive smells and sounds. This part of the analysis involves judgmental and subjective interpretations of a landscape's or feature's aesthetics;

96. The BML landscape study considers aesthetic quality from the very limited assessment framework of *memorability, naturalness, vividness* and *coherence*. These are described as follows (p.16):

> *Memorability:* the way in which experience of a landscape remains in the memory. Highly memorable landscapes comprise a key component of a person's recall or mental map of a region or district. This is also often related to a landscape's legibility and beauty.
>
> *Naturalness:* natural features and landscapes appear largely uncompromised by modification and appear to comprise natural systems that are functional and healthy. Naturalness describes the perception of the predominance of nature in the landscape. A landscape may retain a high degree of aesthetic naturalness even though its natural systems are modified. Similarly, landscapes that have high ecological values may not necessarily display high qualities of visual naturalness.
>
> *Vividness:* vivid landscapes are widely recognised across the community and beyond the local area and remain clearly in the memory; striking landscapes are symbolic of an area due to their recognisable and memorable qualities, including their landform.
>
> *Coherence:* coherence describes the way in which the visual elements or components of any landscape come together…

97. These factors are, in my opinion, a grossly inadequate framework to apply to the assessment of aesthetic quality. The inadequacy of this framework can be understood in part from the following considerations:

    97.1. Memorability and vividness are, as described above, essentially one and the same thing: the way a landscape "…remains in the memory", or remains "…clearly in the memory". The application of these factors - in fact just a single factor as they are described above, is highly speculative, as no tests of memorability have, in fact, been conducted. It is neither a valid nor a reliable indicator of aesthetic quality.

    97.2. Naturalness is a largely irrelevant factor, given that all landscapes and features that are candidates for outstandingness will already have passed the threshold of naturalness, and can be regarded as natural landscapes and natural features.

98. In simple terms, aesthetic value[11], as it applies to the natural environment, may be understood as the capacity of a landscape or landscape feature to elicit feelings of pleasure or displeasure.

99. While such feelings derive from a number of properties of the environment, these properties are not determinative, in the sense that if a landscape or feature possess properties *x*, *y*, and *z*, it is therefore an aesthetically pleasing landscape, or a landscape with aesthetic quality.

100. In simple terms, when experiencing a landscape the feelings of pleasure (or displeasure) come first, and this may be followed by an analysis to establish the basis for these feelings of pleasure. The Boffa Miskell landscape study appears to reverse this process and assume that landscapes that posses certain (flawed) attributes are necessarily aesthetically pleasing landscapes.

101. This is a similar issue to that which I have raised with respect to the landscape assessment generally - the assessment begins with a consideration of factors at an 'atomistic' level in the expectation that value, or significance will derive or emerge from that process. It is the reverse of the process implied by the notion of landscape, as an area perceived by people.

102. The assessment of aesthetic value appears neither valid nor reliable. The properties or attributes applied to the assessment of aesthetic value are certainly not valid. Reliability cannot be determined as the study provides no indication of the spatial distribution of aesthetic value - aesthetic quality does not appear to have been mapped (p.20):

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[11]Aesthetic value is the value that an object, event or state of affairs (most paradigmatically an art work or the natural environment) possesses in virtue of its capacity to elicit pleasure (positive value) or displeasure (negative value) when appreciated or experienced aesthetically. (Levno Plato and Aaron Meskin (2013). *Encylopedia of Quality of Life Research* . Springer)

Gobster et al.(2007) have described aesthetic experience as:
"...a feeling of pleasure attributable to directly perceivable characteristics of spatially and/or temporally arrayed landscape patterns"

> The study team utilised the mapping of significant values on GIS to analyse where particular values overlap. Not all values were mapped (such as aesthetic values)...

103. As a consequence of the decision to not map aesthetic quality, or value, there does not appear to be any basis upon which the assessment of aesthetic quality within the Sounds - perhaps the single most important factor from a community perspective - can be validated.

104. The principle concern arising from this critique is that aesthetic value appears unlikely to have been assessed from the perspective of the community. Indeed, from the community's perspective I would regard the aesthetic quality of the Sounds as the predominant quality influencing outstandingness, and on this basis the assessment of aesthetic value cannot be regarded as credible. In my opinion, the failure to identify areas of ONL within the inner Sounds can be attributed in part to a flawed framework for the assessment of aesthetic quality.

Regional, or District comparator

105. I consider another assessment factor that may be influential in the failure to identify outstanding natural landscapes within the inner sounds can be found in the following statements:

> The difficulty the study team faced during the landscape evaluation phase lay in determining whether these landscapes meet the threshold of being 'outstanding **at a district level**'.

> The study team concluded that due to the complexity and diversity of the Marlborough Sounds, and its value nationwide, the entire Marlborough Sounds is considered an Outstanding Natural Landscape **at a national scale**. **At the more detailed regional/district scale**, however, the study team concluded that some areas within the Marlborough Sounds could not be identified as an ONFL. (p.61) [emphasis added]

106. These quotes raise the issue of the appropriate geographical frame of reference for the assessment of outstandingness: whether comparisons are to be made at a national, regional or district level.

107. The High Court, in *Man 0'War Station v Auckland Council* stated at [47]:

> ...I am not persuaded that it is necessary to incorporate a "national" comparator (or even a regional or district one) into the consideration of "outstandingness". The Courts in which the jurisprudence has been developed have not been asking "is this a nationally significant outstanding natural landscape?" They have been asking simply "is this an outstanding natural landscape". That is the issue that they are required to consider, under the RMA.

108. This statement provides support for the assessment of landscape significance on the basis of an independent threshold of outstandingness that is not tied to a comparison of the the other landscapes in a district or region. By this approach, all landscapes that pass an outstandingness threshold are

selected, such that the range includes the best, and also the 'best of the best' in any district or region, as long as they meet a threshold of outstandingness.

109. The approach adopted in the Boffa Miskell landscape study appears to be based upon the regional/district comparator model, which in my opinion is no longer a valid model for landscape assessment practice.

110. There are significant implications for the application of the comparator model in Marlborough. Given the uniqueness of the Marlborough Sounds, there are grounds for regarding the Sounds in their entirety as an ONL - the Boffa Miskell study states this[12], while the MEP (Chapter 7 Landscape) refers to the Sounds as "…an iconic and unique landscape with considerable scenic beauty". However, using the comparator mode for the identification of ONFL, each landscape or feature within the sounds is effectively compared with every other landscape or feature within the Sounds, with the implication that only the most outstanding landscapes and features make the cut.

111. The application of an outstanding threshold rather than a comparator approach, would ensure that all landscapes and features recognised as outstanding would be classified as such.

Summary

112. I have restricted this analysis and discussion to the validity, reliability and plausibility/credibility of the landscape and natural character overlay maps and the BML assessments that informed them. As discussed in this report, the mapping of outstanding natural landscapes and features, and the mapping of high, very high and outstanding natural character on the MEP overlay maps is characterised by inconsistencies and flaws that have their root cause in a failure to adequately define and operationalise the key concepts that underpin RMA-based landscape and natural character assessments.

113. In my opinion, the concepts off of natural character, landscape and feature have been inadequately defined and erroneously interpreted, such that the proposed plan provisions fail to give adequate effect to the NZCPS. In particular:

    113.1. The ambiguous, uncritical interpretation of the concept of natural character, and the manner in which NZCPS Policy 13(2) has been interpreted has created a situation I consider will create considerable confusion through the failure to sufficiently differentiate natural character from landscape, as Policy 13(2) requires.

    113.2. The way in which landscape has been conceptualised and investigated is, in my opinion inconsistent with accepted definitions of landscape as a perceptual phenomena. It is not credible to maintain, as the Boffa

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12 "*The study team concluded that due to the complexity and diversity of the Marlborough Sounds, and its value nationwide, the entire Marlborough Sounds is considered an Outstanding Natural Landscape at a national scale.*" (p.61)

Miskell landscape study does, that the scale of the Marlborough Sounds is such as to preclude the identification of outstanding natural landscapes within the inner sounds.

113.3. The understanding of what constitutes a feature, as it should be understood in the context of NZCPS Policy 15, is flawed, leading to the identification of terrestrial features in circumstances where landscape/seascapes should be recognised, particularly within the inner Sounds.

113.4. Seascapes appear to have been assessed only from the perspective of how they might contribute to the perception of terrestrial landscapes, which appear to be the dominant focus of assessment and planning provisions, particularly within the inner sounds. The BML landscape study has erred in not regarding landscape and seascape as an holistic conceptual entity. As a consequence, undue attention has been focussed on terrestrial features and the marine component of inner Sounds landscape/seascapes are inadequately recognised and protected.

113.5. The concept of outstanding natural character (NZCPS Policy 13) has not been clearly articulated, not is the method of its identification transparent, valid and reliable. Many inconsistencies and unexplained discrepancies are apparent in the mapping of ONC on the planning overlay maps.

113.6. Aesthetic quality - perhaps the most significant quality of the Sounds - has been misinterpreted and incorrectly evaluated.

113.7. The adoption of a regional/district comparator model for the assessment of ONFL - now recognised by the High Court as inappropriate - works against the classification of many worthy Sounds landscapes and features as ONFL.

114. I have not commented on the specific policies and objectives of Chapters 6 & 7 of the MEP, nor the appendices of landscape and natural character values, other than to refer to problems associated with language and terminology. The lack of definitions relevant to the natural character and landscape provisions of the MEP, and the lack of clarity of meaning through the use of a range of terms best regarded as jargon, creates a planning discourse in which it is difficult, if not impossible, to understand what is being protected or preserved, and why.

115. Given that provisions for managing marine farming have yet to be written for Chapter 13, *Use of the Coastal Environment*, and given the ongoing pressure to expand marine farming operations in the Sounds, the almost total absence of high, very high and outstanding natural character classification and ONL classification for seascapes within the inner Sounds is cause for concern.

116. Had the Boffa Miskell studies established themselves as credible works, marked by validity and reliability, then the absence of ONL from inner Sounds seascapes might be considered plausible. However, as I do not consider this to be the case, it is possible that the reasons for the absence of seascape

ONL may be found elsewhere. In which case, the words of the High Court in *Man o'War Station v Auckland Council* may be pertinent to this situation:

> [59] It is clear from the fact that "the protection of outstanding natural features and landscapes" is made, by s 6(b), a "matter of national importance" that those outstanding natural landscapes and outstanding natural features must first be identified. The lower level documents in the hierarchy (regional and district policy statements) must then be formulated to protect them. Thus, the identification of ONLs drives the policies. It is not the case that policies drive the identification of ONLs, as MWS submits.
>
> [60] As identified by the Council, the RMA clearly delineates the task of identifying ONLs and the task of protecting them. These tasks are conducted at different stages and by different bodies. As a result it cannot be said that the RMA expects the identification of ONLs to depend on the protections those areas will receive. Rather, Councils are expected to identify ONLs with respect to objective criteria of outstandingness and these landscapes will receive the protection directed by the Minister in the applicable policy statement.

ML Steven

20 August 2016

Examples of inconsistencies and discrepancies in mapping: natural character

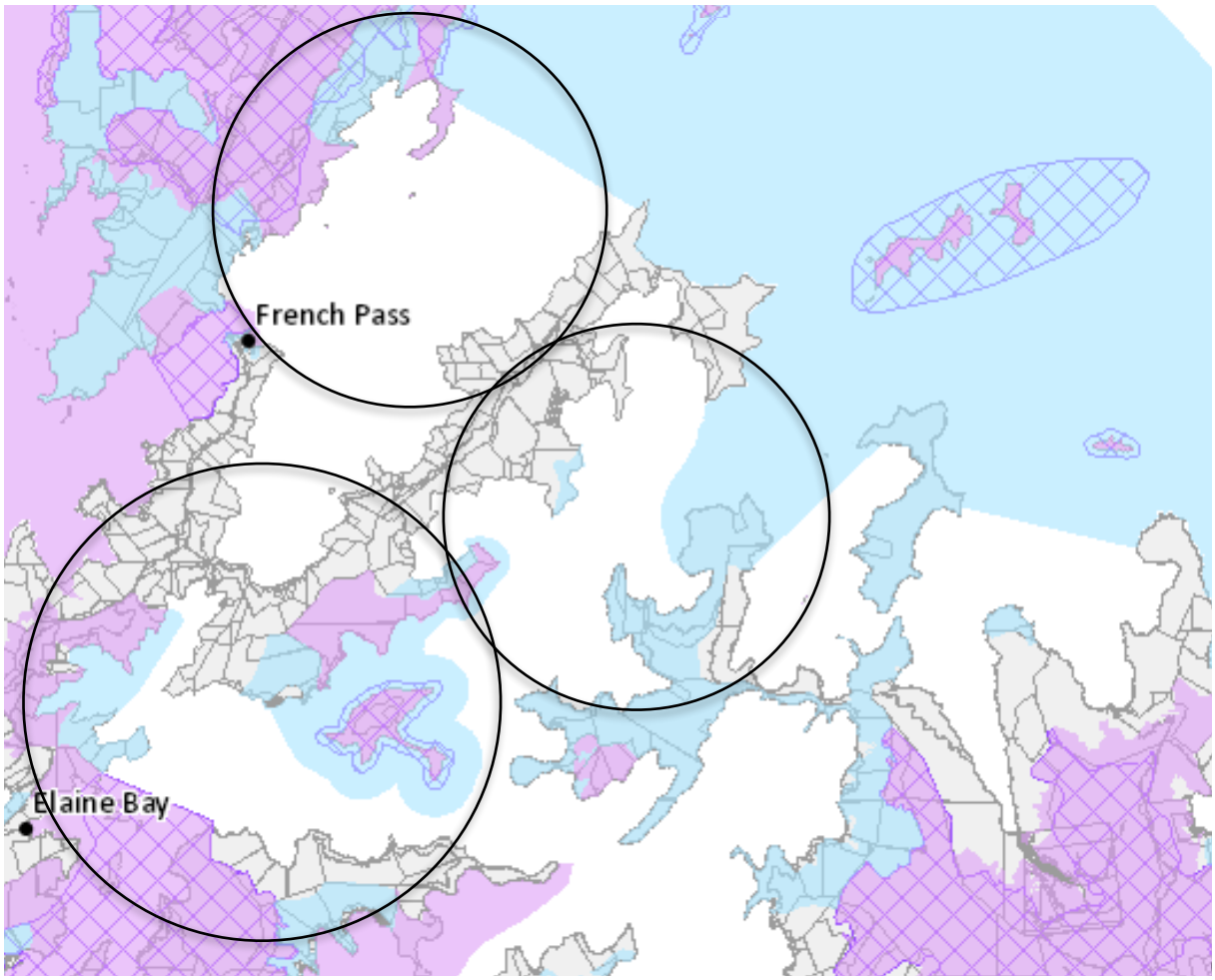

Figure 4: Example taken from MEP natural character overlay showing natural character ratings for outer Pelorus Sound

The circled areas contain examples of natural character ratings that are implausible, not credible. In particular, large tracts of the Coastal Marine Area (CMA) are rated less than High natural character in contexts where such an assessment is not credible. Lack of continuity of High or Very High ratings across areas of the CMA is not explained - for instance, within an area of the Tawhitinui Reach, an area of unclassified marine environment connects two areas identified as exhibiting outstanding natural character: Tennyson inlet and Maude Island. In other areas, while exisiting marine farm developments may diminish the natural character of the marine environment around coastal margins, the effects of marine farming do not extend into more open waters (e.g., Tawhitinui Reach, Waitata Reach, east of French Pass to Clay Point), yet such areas are rated less than High.

The application of the concept of Outstanding Natural Character defies understanding. A reasonable interpretation of outstanding is that it is a rating that exists above and beyond very high, yet ONC is attributed to areas of very high natural character, and also areas of high natural character. How an area of the coastal environment can be high or very high, and at the same time also

outstanding, requires a more coherent explanation than appears in either the Boffa Miskell studies or the MEP. The MEP and BML studies appear to be in conflict concerning the admissibility of areas of high natural character to the outstanding category (see main text of report).

Examples of inconsistencies and discrepancies in mapping: ONFL

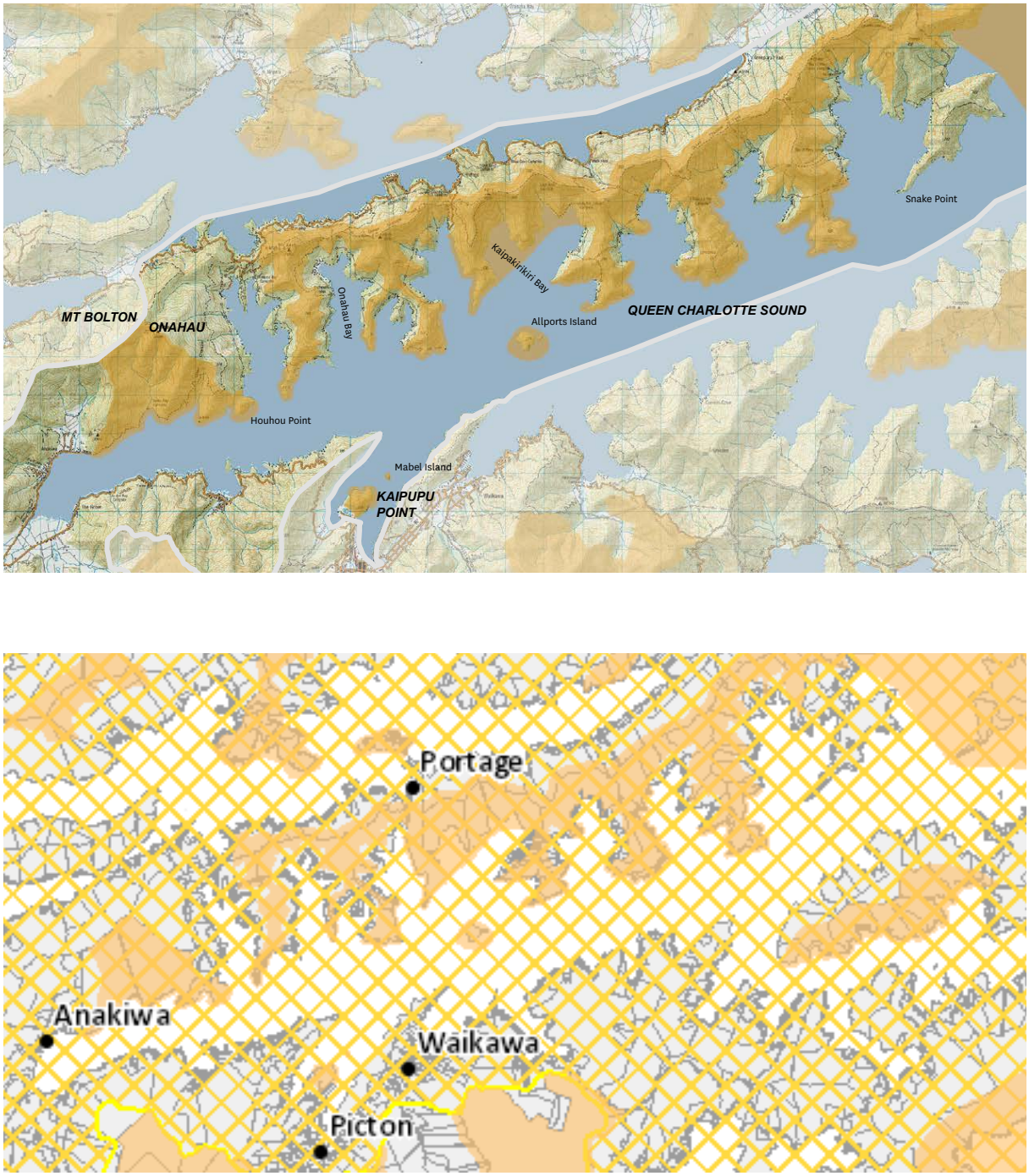

Figure 5: Part Boffa Miskell Map 17 Northern Lands of Inner Queen Charlotte Sound (top) and equivalent area from MEP ONFL overlay map

Within Queen Charlotte Sound, I consider it would be common ground within the community that the landscape/seascape is perceived as a coherent whole. It is not credible to propose the headlands on the northern side of Queen Charlotte Sound as a series of outstanding natural features, rather than a single landscape/

seascape that also extends ONL protection to the seascape of Queen Charlotte Sound.

As noted in the text of the report, the visual ‘noise’ of the HAL cross hatching makes the maps difficult to interpret and is unnecessary/redundant within areas of ONFL.

Figure 6: ONFL and HAL, outer Pelorus Sound. Orange areas are ONFL, cross-hatched areas are HAL.

The extent of ONFL appears to have been defined with reference to the areas of high and very high natural character identified on the natural character maps. If this is so, then the threshold of natural character for the identification of natural features and natural landscapes has been set at an unreasonably high level (High, on the 7-range scale of natural character presented in elsewhere in this report). Accepted practice it to regard landscapes and features as becoming sufficiently natural for section 6(b) and NZCPS Policy 15 purposes within the moderate range of the scale, and certainly within the moderate-high range. On this basis I would regard a very large extent of the seascape area of this map to be regarded as natural enough to be considered for outstanding classification. Among many areas, this would affect the classification of the area east of French pass (large circle) and the seascape of Port Ligar (small circle). The absence of an ONL connection across seascapes enclosed by terrestrial areas identified as ONFL is not explained - Port Ligar is but one of many such examples of this practice.

APPENDIX B

Mussel Farming in Central Pelorus Sound

Dr Brian Stewart, Ryder Consulting

3 December 2015

ryderconsulting
environment + planning + project management

195 Rattray Street
P O Box 1023
Dunedin

C 027 257 1973
T 03 477 2113
F 03 477 3119
b.stewart@ryderconsulting.co.nz

3rd December 2015

Mussel Farming in Central Pelorus Sound

INTRODUCTION

1 The Kenepuru and Central Sounds Residents Association has serious concerns with the existing level of marine farming in the central Pelorus Sounds area, specifically Beatrix Bay, Clova Bay and Crail Bay, and where marine farming is occurring along the north shore in Kenepuru Sound. Their concern arises from the likelihood that the current level of marine farming poses a credible threat to the ecosystem within Pelorus Sound.

2 This report summarises the science behind the concerns and highlights areas where knowledge is believed lacking.

THE AREA UNDER CONSIDERATION

3 Beatrix Bay, Clova Bay and Crail Bay comprise the Beatrix Basin, with Kenepuru Sound lying further to the south. Marine farming, and more specifically mussel farming, is largely concentrated in these areas of Pelorus Sound and occupies some 2500 ha within the Pelorus area. This is a significant increase from the approximately 1000 ha occupied in 1995.

4 Mussel farming is estimated to occupy approximately 15% of the surface area of Beatrix Bay, ~ 10% of the surface area of Crail Bay, and ~ 20-30% of the surface area of Clova Bay.

5 Beatrix Bay is recognised in Appendix B of the Marlborough Sounds Resource Management Plan (MSRMP) as being an area of king shag feeding habitat and is, as a result, an area of international ecological value (MDC 2003). It is also noted as an area within which lemon sole spawn (Department of Conservation 1990).

6 A large body of data has been collected over the years about the physical and biological environment of Beatrix Bay, with the focus largely being on likely effects on this environment from mussel farms (e.g. NIWA 2001, Mead 2002, Christensen *et al.*, 2003, Davidson and Richards 2011, Davidson 2012a,b), and likely influences on mussel growing from currents, nutrient inputs, and other physico-chemical parameters (e.g. Gibbs and Vant 1997, Gall *et al.*, 2000, Gibbs *et al.*, 2002, Safi and Gibbs 2003, Handley 2015). The robustness of these assessments is variable (MDC 2000), but is largely directed by the suggested protocols outlined in a guideline document prepared by the Department of Conservation (DoC 1995). The majority of assessments of environmental effects carried out for applicants wishing to establish mussel farms have, to date, come to the conclusion that environmental effects will be less than minor.

GENERAL EFFECTS OF MUSSEL FARMING

7 At this point it is worthwhile examining the likely effects of mussel farming on the marine environment. Such effects fall into a number of categories and include biological effects, physical effects and physico-chemical effects, each with varying degrees of influence on the surrounding ecosystem.

Sediment deposition.

8 Deposits beneath marine bivalve aquaculture farms occur as a result of four processes: (a) shell drop, (b) faeces, (c) pseudofaeces, and (d) biofouling, with between 250 and 400 tonnes of sediment being reported to accumulate beneath each hectare of farm per annum (e.g. Hartstein and Rowden 2004, Hartstein and Stevens 2005). Faecal pellets and mucous-bound pseudofaeces have greater sinking velocities than their constituent particles. Thus mussel farms typically increase sedimentation rates under culture sites (Hatcher *et al.*, 1994; Callier *et al.*, 2007; Giles *et al.*, 2006). Such deposits may change the character of substrate beneath farms by covering fine, soft substrate with coarser material (e.g. dead shell or live bivalves) that will ultimately lead to a new suite of fauna living beneath the farm (Mead 2002; Keeley *et al.*, 2009). The shell debris may also promote the accumulation of fine sediment and organic matter by dampening currents and reducing oxygen percolation into the sediment, and in doing so, reduce the rate of mineralisation of organic matter (MPI 2013a). Finer and much lighter deposits, such as faeces and pseudofaeces (particles which have been rejected as unsuitable for food) may gradually sink to the bottom, build up over time, and may eventually lead to anoxic conditions prevailing in fine sediments. This results in an associated change in substrate chemistry and likely change in infaunal composition (Chamberlain *et al.*, 2001; Christiansen *et al.*, 2003). Lastly, biofouling organisms growing on bivalves may, in turn, produce their own

deposits (Kaiser *et al.* 1998) and will also accumulate on sediments beneath mussel farms after being removed during the harvesting process.

Nutrient Stripping and/or addition

9 There have been a number of studies that have shown that marine aquaculture, particularly of filter feeding bivalves, alter the amount of nutrients entering or leaving marine farms (e.g. Waite, 1989; James *et al.*, 2001; Keeley *et al.*, 2009). Bivalves selectively filter out particles in the range of 5 – 500 μm for food and reject as pseudofaeces those particles that are not suitable. Thus water in the lea of a farm may be depleted of nutrients that are associated with phytoplankton, which may have been utilised by organisms downstream. Conversely, as a by-product of metabolism there is a release of nutrients into the water column by the organisms being farmed, usually in the form of nitrogen excreted as ammonia (Keeley *et al.*, 2009). Such excretion from farmed bivalves may influence phytoplankton downstream of a marine farm by providing needed nutrients in the form of nitrates (Broekhuizen *et al.*, 2002).

Plankton depletion (zooplankton and phytoplankton)

10 As with nutrients, there has been considerable research into type and amount of food (plankton) stripped from the water column by aquaculture farms (e.g. Bourgrier *et al.*, 1997; Shumway *et al.*, 1985; Safi and Gibbs 2003). Zeldis *et al.*, (2004) noted that filter-feeding bivalves have the potential to alter the composition of the plankton biomass by differentially clearing phytoplankton and zooplankton. Such stripping has implications for downstream communities in the form of reduced recruitment through the removal of eggs and/or larvae, and reduced food supply.

Effects on benthos under and adjacent to longlines and droppers

11 In addition to the sediment deposition discussed above anchor systems impact on the substrate beneath a farm and on the associated benthic flora and fauna, albeit in a relatively minor way. However, a system that is buried in the substrate (e.g. screw anchors) is likely to have less impact than structures set on the seabed.

Shading

12 Shading by marine farm structures and longlines bearing shellfish droppers have the potential to inhibit the abundance, biomass and species compositions of both benthic microalgae and macroalgae growth by virtue of limiting light (shading) (Huxham *et al.,* 2006; McKindsey *et al.*, 2011). However, this is recognised as a relatively minor issue in all but very densely clustered farms (Keeley *et al.*, 2009, Handley 2015).

Effects on local currents

13 Water currents are a key factor for transport of nutrients, plankton, larvae, and for dispersal of material. Organisms may also have habitat preferences influenced by water speed. Water currents are therefore a key driver of ecological processes (MPI 2013b). It has been well established that marine farm structures influence local water currents by attenuating velocity and/or changing current direction (e.g. Gibbs *et al.*, 1991; Boyd and Heasman 1998; Plew *et al*., 2005, 2006; Morrisey *et al.*, 2006; Plew 2011). Such changes may result in changes to the depositional footprint, and/or changes to the local ecology.

Fouling and biosecurity

14 Fouling by other marine organisms can be a problem for marine farms (Mazouni et al., 2001; Costa-Pierce and Bridger 2002). In New Zealand the invasive tunicates *Styela clava*, and *Didemnum vexillum*, and Japanese kelp *Undaria pinnatifida* are a problem on mussel farms in the Marlborough Sounds and some other areas (Coutts and Forrest 2007; Gust *et al*., 2007).

THE LIKELY ENVIRONMENTAL EFFECTS DUE TO MUSSEL FARMING IN CENTRAL PELORUS SOUND

15 Bivalve aquaculture is a multi-million dollar earner for the New Zealand economy, with most of the revenue generated by the farming of Greenshell™ mussels (*Perna canaliculus*) (Keeley *et al.*, 2009). Despite the earning potential of such industries, one must not lose sight of the wider ecological impacts aquaculture farms may have on immediate or nearby ecosystems.

16 Experimental mussel farming in New Zealand did not start until 1968 (Stead 1971). However, mussel dredging started in about 1962, with dredges 4.5 to 8 ft wide working the beds throughout much of the suitable habitat of the Marlborough Sounds (Stead 1971). As a consequence, large tracts of the soft bottom benthic habitat of the Marlborough Sounds cannot be considered pristine.

17 It is unfortunate that there are few baseline survey data for Beatrix Bay from before 1962, or even prior to 1990 when aquaculture expansion began in earnest, apart from Stead (1971) noting that there were low densities of green lipped mussels (*Perna*) and blue mussels (*Mytilus*) in the lower intertidal and upper sub-littoral zones.

18 The majority of ecological assessments carried out in central Pelorus focus solely on the sea floor immediately beneath and within a few metres of mussel farms. Consequently

there have been relatively few comprehensive descriptions of the biota within the central Pelorus Sound area. Notable excpetions are Mead 2002 and Duffy *et al*. (in prep).

19 It is well known that mussel farms are a source of biodeposits, with up to 400 tonnes of sediment being reported to accumulate beneath each hectare of farm per annum (Hartstein 2005, Hartstein and Stevens 2005). Further, MPI (2013a) recognises that a mussel farm may well produce an impact on other farms and nearby communities, while escaping such impacts itself, with the lightest deposits from mussel farms reaching perhaps in excess of 90 m from a farm (Kuku Mara 2002) and ultimately influencing downstream communities.

20 There is evidence that mussel farms may influence feeding and recruitment for nearby communities by filtering out phytoplankton and zooplankton upstream of a community (e.g. Safi and Gibbs 2003; Plew 2011). There is also evidence that mussel farms alter current regimes that bathe nearby communities (e.g. Gibbs et al., 1991; Plew et al., 2006). Significant reductions of up to 70% in current speed may occur in seawater flow through mussel farms, compromising feeding efficiency and therefore carrying capacity (Gibbs et al., 1991; Boyd and Heasman 1998; Plew et al., 2006).

21 Waite (1989) observed that in the absence of adequate seawater flow through farms, there may be an up to 60% reduction of food occurring due to retardation of flow by farm structures and grazing by mussels. He further noted that longlines have been found to be relatively impermeable to currents and effectively deflect currents to run parallel to them.

22 Handley (2015) in a recent report, noted the likelihood of a "shifting baseline". In such a scenario a gradual change to seafloor habitat through time occurs such that what exists today does not closely resemble historical benthic communities and sediment. Possible drivers of a shifting baseline are thought to include sedimentation derived from land based human activities such as farming and logging, dredging and other harvesting of shellfish, and increased density of aquaculture farms (Handley 2015).

23 It is unfortunate that, as already acknowledged, there is a real paucity of baseline data for many of the areas within which marine farming has flourished. Without such data comparison of current benthic health with past benthic health is largely conjecture. However, a dive video survey carried out in September 2014 that compared benthic flora and fauna on reefs at two sites within Beatrix Bay with a site at a location that is devoid of mussel farms in Miro Bay, Marlborough Sounds, showed that there were differences in community structure at sites adjacent to mussel farms and at sites where mussel farms do

not exist. Results, however, were not clear-cut and the author noted that other environmental factors must be considered (Stewart 2014).

24 The investigations that have been carried out within central Pelorus over the past decade are insufficient to gauge whether or not there has been any impact on soft bottom communities beyond the immediate footprint of existing mussel farms and are certainly insufficient to gauge any effects on hard substrata. What is concerning is that there has been little or no requirement to monitor the wider environment or the sustainability of marine farming.

CUMULATIVE ECOLOGICAL EFFECTS

25 There is an acknowledged gap in knowledge about cumulative effects of mussel farms (Mead *et al.*, 2001, MPI 2013a), and the effect of "fencing off" inshore communities (Keeley *et al*., 2009; MPI 2013a).

26 Within the context of aquaculture development in the marine environment, cumulative effects are defined as:

Ecological effects in the marine environment that result from the incremental, accumulating and interacting effects of an aquaculture development when added to other stressors from anthropogenic activities affecting the marine environment (past, present and future activities) and foreseeable changes in ocean conditions (i.e. in response to climate change) (MPI 2013a).

27 A cumulative effect is referred to in Section 3 of the RMA as an effect which arises over time or in combination with other effects. Peart (in Milne 2008) believes the effects based approach of RMA fails to deal adequately with cumulative effects arising from granting of individual consents. The author of the paper (Milne 2008), however, suggests that the RMA (1991) supplies the tools to deal with cumulative effects but believes the challenge is for local authorities to use the tools available to them before the "horse has bolted". It is worthwhile noting that within the cited paper (Milne 2008) cumulative effects are largely referred to in terms of natural character, landscape, amenity, but not ecology. In my view this is a serious oversight.

28 Examples of cumulative ecological effects include the additive effect of multiple local scale benthic footprints; incremental depletion of phytoplankton and zooplankton as a result of shellfish culture; and spread of pests/diseases among farms that leads to multiple reservoir populations. Cumulative effects of eutrophication can occur gradually over long

time periods (Armitage et al. 2011) and cascading effects to the environment, such as shifts in benthic communities, can last for decades (Herbert and Fourqurean 2008).

29 The potential for shellfish aquaculture to contribute to cumulative effects in the marine environment will be dependent on the size of the culture, density of farms, and environmental characteristics of the area being farmed (e.g. hydrodynamics, phytoplankton biomass, anthropogenic nutrient inputs etc.). Using "sustainability performance indicators", Gibbs (2007) suggests that the retention (flushing) time for a water body should not exceed 5 percent of the clearance time (filtering efficiency) of farmed mussels in order to minimise cumulative effects on the wider ecosystem. According to the Aquaculture Stewardship Council (ASC 2012), where the area of marine farms exceeds 10% of the surface area of a water body, as in Beatrix Bay, the ratio of clearance time over retention time should be >1. Shaw Mead (2015), among others, has calculated that the CT/RT ratio for Beatrix Bay is likely two or even three orders of magnitude less than one. This suggests that the ecological carrying capacity for the bay is already well exceeded.

30 Spatial modelling tools offer a way of estimating the extent to which the cumulative effects of mussel farming may be approaching ecological carrying capacity on "bay-wide" and "regional" scales. However, knowledge gaps are still evident in these models; particularly in the biological aspects (e.g. feeding behaviour and growth of the shellfish) which are still areas of active research. Long-term monitoring of the wider ecosystem is required to validate and improve models and to assess wider cumulative environmental change. Bathymetric and hydrodynamic data are needed for all regions supporting aquaculture, as this provides the basis for understanding waste dispersion and assimilation. The recently completed NIWA model for Pelorus Sound may well help with this.

CARRYING CAPACITY

31 One of the most contentious issues with respect to the development of mariculture throughout the world is the concept of "carrying capacity" (McKindsey. *et al.*, 2006). For bivalve mariculture, Inglis *et al.* (2000) divided carrying capacity into four functional categories:

i) physical carrying capacity — the total area of marine farms that can be accommodated in the available physical space,

ii) production carrying capacity — the stocking density of bivalves at which harvests are maximized,

iii) ecological carrying capacity — the stocking or farm density which causes unacceptable ecological impacts,

iv) social carrying capacity — the level of farm development that causes unacceptable social impacts.

32 Determining ecological carrying capacity for growing waters under its broad definition is difficult because there is no strong foundation for defining limits within a marine ecosystem based on complex ecological processes. Simple modelling techniques limit any findings to a broad, bay-wide scale assessment of ecological carrying capacity and do not incorporate feedback mechanisms such as changes to the flushing regimes induced by structures (Grant & Bacher 2001; Plew et al., 2005) or far-field nutrient enhancement and increased phytoplankton growth (Gibbs et al., 1992).

33 A number of authors have expressed concerns regarding Beatrix Bay and other similarly sheltered waters in the Marlborough Sounds being "over allocated" with respect to aquaculture, with the likely consequence that the carrying capacity of the bay may have been exceeded (Hayden et al., 2000; Mead 2002, 2013). Certainly there has been a steady increase in the area of mussel farm development in Pelorus Sound over time (Handley 2015) (Figure 1).

34 Low mussel growth rates and production in the late 1990s to early 2000s, and more recently, seemed to support the conjecture that production carrying capacity for Beatrix Bay may be being approached. However, there have been periods of strong recovery of mussel yield after low production periods and the work of Zeldis (2008) and Zeldis et al. (2013) suggest that productivity and farming intensity of aquaculture in the Pelorus Sound is, to date, occurring at densities below the production carrying capacity of the system, due to nutrient availability being driven by climate forcing in El Nino years.

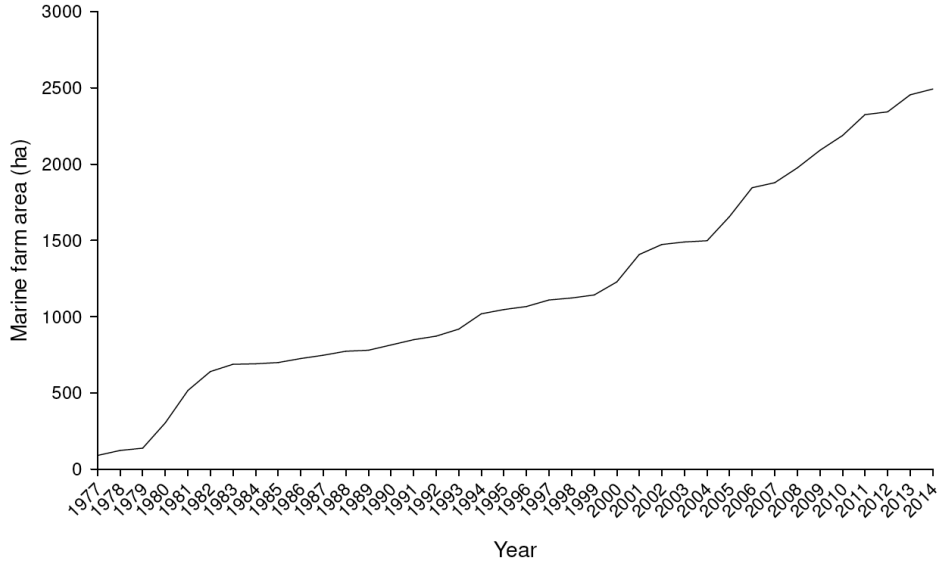

Figure 1 *Cumulative area (ha) of Pelorus Sound marine farms, 1977-2014 (from Handley 2015).*

35 Nevertheless, anecdotal evidence and press clippings from the Marlborough Express from January, April, August and September 2013 suggest that yield fell again during the 2012 - 2013 seasons. This suggests to me that it is entirely possible that the Beatrix Basin and similar areas may be being farmed close to or beyond sustainable production limits during years of naturally low primary production.

36 It is very important to note that production carrying capacity and ecological carrying capacity are not the same. Jiang & Gibbs (2005) concluded that ecological carrying capacity limits are likely to be around 20% of the production capacity limits, so it follows that ecological carrying capacity may be being exceeded by the current level of culture in some areas. Indeed, Mead (2015, Appendix 6) calculated that the ecological carrying capacity of Beatrix Bay may currently be exceeded by an order of 5.

NIWA BIOPHYSICAL MODEL

37 Modelling of the processes involved in and influencing mussel aquaculture is a useful tool in predicting carrying capacity and effects on the environment, or on the cultured species. However, modelling studies have primarily focused on carrying capacity in terms of sustaining farm production, rather than ecological carrying capacity.

38 The Marlborough District Council (MDC) commissioned NIWA to develop a pair of biophysical models for the Marlborough Sounds, one for the Queen Charlotte Sound/Tory Channel system and one for the Pelorus Sound system (Hadfield et al., 2014, Broekhuizen et al.,

2015). The models used current and historic data to assess effects of mussel farming on a number of parameters under three possible scenarios. i.e. (i) no mussel farming, (ii) mussel-farming at the extent revealed by a 2012 aerial survey ('existing farms'), and (iii) mussel farming at the scale implied by all licenses approved (at about Feb. 2014; 'approved farms'). The 'existing farms' scenario was treated as the baseline.

39 Both reports have been extensively peer reviewed and accepted by the MDC. The models provide useful tools for understanding the interaction of physical and biological parameters within the areas under study, and doubtless, the accuracy of each will improve with continued ground truthing (i.e field observations) and with the addition of more data as it comes to hand.

40 As it stands, however, the model for Pelorus Sound raises some issues with regard to effects of mussel farms. Tables 1 and 2 below are based on information provided in Figures 5.13 and 5.14 in Broekhuizen et al. (2015).

Table 1 *Summary of likely changes to water column parameters during summer if mussel farms were removed, as compared to the baseline (existing farms) scenario.*

	Clova Bay	**Beatrix Bay**	**Crail Bay**	**North Side Kenepuru**
Zoo Plankton Levels	10 times more	Up to 10 times more	Up to 10 times more*	Up to 10 times more
Small Palatable Detritus Levels	2 times more	Up to 2 times more	Up to 2 times more	Up to 2 times more
Large Palatable Detritus Levels	4 times more	Up to 4 times more	Up to 4 times more	Up to 4 times more
Ammonium in the water column	60%+ less	Up to 60% less	Up to 60% less	Up to 60% less
Nitrates in the water column	50%+ less	50% + less	50%+ less	50%+ less
Chlorophyll in the water column	Slightly more	Slightly less	Slightly less	Up to 25% less

** Up to means it is may be less in some parts of the Bay*

Table 2 *Summary of likely changes to water column parameters during winter if mussel farms were removed, as compared to the baseline (existing farms) scenario.*

	Clova Bay	**Beatrix Bay**	**Crail Bay**	**North Side Kenepuru**
Zoo Plankton Levels	3+ times more	2+ times more	2+ times more	8+ times more
Small Palatable Detritus Levels	3 times more	Up to 2.5 times more	Up to 2.5 times more*	3+ times more
Large Palatable Detritus Levels	4 times more	Up to 3 times more	Up to 3 times more	4+ times more
Ammonium in the water column	50%+ less	Up to 50% less	Up to 50% less	50%+ less
Nitrates in the water column	15% less	Up to 15% less	Up to 15% less	Up to 30% less
Chlorophyll in the water column	3 times more	Up to 2.5 times more	Up to 2.5 times more	Up to 2.5 times more

** Up to means it is may be less in some parts of the Bay*

41 While the elevated ammonium concentrations are well below Australian and New Zealand guidelines for fresh and marine water quality (ANZECC 2000) toxicity guideline concentrations for marine waters the consequences higher in the foodweb of reduced (or elevated) phytoplankton concentration or reduced zooplankton concentration under the 'existing farms' scenario are of more concern. Any organisms will suffer if their foodsupply is sufficiently reduced. Furthermore, as already stated, there may well be downstream effects from reduced larval recruitment (e.g. reduced food supply for organisms higher up the food chain, reduced abundance and/or diversity of settlement). The authors of the model concede that are questions to answer. Dr Breokhuizen states "I suspect that, relative to no mussel and no fish farms, some of the changes predicted by the model are large enough that other aspects of the foodweb may change materially" (Broekhuizen 2015).

42 The relationship between the environment and the growth of Perna canaliculus, which underpins any related ecosystem models, is presently poorly defined (Keeley *et al.,* 2009). A better understanding of the feeding physiology and energetics of Perna species would greatly improve confidence and reduce variance in model outputs, particularly when it comes making predictions for new environments.

DISCUSSION

43 Davidson (2012c) states that "Inappropriate or poorly planned human endeavours have often had a negative effect on the marine environment. This has undoubtedly led to a reduction in the quality and quantity of biological values in the Marlborough Sounds. It is therefore important remaining biological values are not further adversely affected and are well managed."

44 I consider that we simply do not know enough about the marine ecosystems within Pelorus Sound to evaluate the ecological effects of existing farms, or to allow further development of aquaculture in the area, without a comprehensive plan to monitor the ecology of the system. Baseline conditions and the current level of cumulative effects from past and existing developments and activities (including land based) are not well documented or monitored in the coastal environment. Additionally, nutrient inputs to the marine environment from land-derived diffuse (non-point) sources, and natural oceanic sources such as denitrification and burial are not well quantified.

45 Due to uncertainty around the cumulative effects of multiple nutrient inputs in New Zealand's coastal environments, it is difficult to adaptively manage any one activity in response to changes occurring in the wider environment. Hence, a precautionary approach utilising a

number of tools (such as modelling and monitoring) is essential in developing aquaculture in any coastal environment.

46 The precautionary approach, as enunciated in Policy 3 of the NZCPS, seeks to adopt a precautionary approach towards proposed activities whose effects on the coastal environment are uncertain, unknown, or little understood, but potentially significantly adverse.

47 Among the important tools and components of a precautionary approach are:

1. The use of models and existing data to gauge limits to development within the context of a region's assimilation capacity (i.e. ecological carrying capacity).
2. Establishment of wider-ecosystem, long-term monitoring programmes that include establishment of baseline conditions of a region and adoption of limits of acceptable change.
3. Targeted monitoring and research for validating and improving accuracy of predictive models and understanding the role of aquaculture in driving cumulative effects.

48 There is an urgent need for the science to catch up with the industry. Despite what industry stakeholders say about there being a large amount of information available, there has been surprisingly little targeted monitoring done to determine effects of aquaculture on nearby ecosystems or on the wider Marlborough Sounds environment.

49 It is well recognised that there are little baseline data available from before aquaculture was introduced to the Sounds, but of more concern is the fact that there has apparently been little monitoring of any farms once farms are established. As far as I can ascertain there appears to have been little or no adaptive management taking place with respect to environmental issues for any marine farm within the Marlborough Sounds.

50 I would suggest that the requirements for assessing ecological carrying capacity and managing cumulative effects fall beyond the scope of a single consent applicant and are, in my opinion, best led by the industry in partnership with science agencies, local authorities (e.g. Dubé 2003; Hargrave *et al.,* 2005, Zeldis 2008a,b) and central government departments (Morrisey *et al*. 2009; Zeldis *et al*., 2011a,b). It is critical that this task is undertaken in order to develop ecosystem-based management programmes in an adaptive manner.

51 Adaptive management was defined in New Zealand in the Environment Court in the case of Crest Energy Kaipara Limited v Northland Regional Council (Decision A. 130/09).

52 The five features are:

1. that stages of development are set out;
2. that the existing environment is established by robust baseline monitoring;
3. that there are clear and strong monitoring, reporting and checking mechanisms so that steps can be taken before significant adverse effects eventuate;
4. that these mechanisms must be supported by enforceable resource consent conditions that require certain criteria to be met before the next stage can proceed; and
5. that there is a real ability to remove all or some of the development that has occurred at the time if the monitoring results warrant it.

53 It is my belief that the DoC (1995) guidelines for assessing sites for aquaculture and requirements for on-going monitoring are inadequate. Handley and Cole (2000) recommended that appropriate monitoring conditions should include phytoplankton and nutrient availability, current dynamics, species assemblage changes, sediment grain size analysis, nutrient deposition, and visual observations of the benthic epibiota inside and outside the farm at frequencies appropriate to each of the issues. They further recommended that results from all monitoring should be reviewed after 3 and 5 years and assessed by the appropriate consent authority.

54 MPI (2013b) suggest that AEE monitoring is crucial to assessing the effects of a marine farm on the surrounding environment. They advise that a monitoring plan needs to be thought about early on, including whether and what baseline monitoring is needed, and how any ongoing monitoring is undertaken and state that it is important to look at what monitoring already exists to see whether that can be used. In my opinion there is an urgent need to implement a control based monitoring programme for mussel farming within the Marlborough Sounds. Such monitoring is essential to empirically determine the impacts of mussel farming within the Sounds. Without estabilishing the level of effects is it impossible to establish an ecologically acceptable level of mussel farming.

55 There is little doubt in my mind that aquaculture, as practiced in the Marlborough Sounds, results in measurable changes to marine communities in the Sounds and perhaps to the ecosystem as a whole. There are strong indications that the low flush areas of Clova Bay, Crail Bay and Beatrix Bay are being farmed beyond what might be considered an acceptible ecological carrying capacity. It has been said that Beatrix Bay is a "Farming" area as though that somehow validates any ecological changes that ensue from marine farming. If one accepts this and accepts that ecological change is a necessary part of aquaculture, that needs to be recognized and accepted by the wider community. If, however, widespread ecological change

is not accepted, guidelines as to how much change is acceptable, and how to monitor the degree of change, need to be implemented with some urgency.

56 In summary, indications are that ecological carrying capacity is being exceeded in the central Pelorus area. For future mussel farm applications and/or renewals I would suggest that it is imperitive that the applicant be required to show that this is not the case before consents are granted.

Yours faithfully
Ryder Consulting Limited

Dr Brian Stewart
Senior Environmental Scientist
b.stewart@ryderconsulting.co.nz

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