

Science and Technical Advisory Group Meeting Agenda

Dates and Location: Wednesday 27 November 2019 9.00am-5.00pm, Terrace Conference Centre, 114 The Terrace, Wellington.

STAG Members Present: Joanne Clapcott, Ian Hawes, Clive Howard-Williams, Jenny Webster-Brown, Ken Taylor (chair), Bev Clarkson, Bryce Cooper, Jon Roygard, Adam Canning, Marc Schallenberg, Russell Death, Mike Joy, Chris Daughney, Graham Sevicke-Jones

Officials: Jennifer Price, Kohji Muraoka, Karwin Perez, Nik Andic, Stephen Fragaszy, Martin Workman, James Hogan, Carl Howarth

Apologies: Jamie Ataria, Ra Smith, Tanira Kingi, Dan Hikuroa, Mahina-a-Rangi Baker

Items:

	8.45 am	Coffee and tea	(15 min)
1.	9.00 am	Consultation debrief and feedback (Chair, STAG members)	(15 min)
2.	9.15 am	Plan for next few months (Martin Workman)	(30 min)
3.	9.45 am	Sediment	(45 min)
	10.30 am	Morning tea	(10 min)
	10.40 am	Sediment continued	(20 min)
4.	11.00 am	Nutrients	(1.5 hr)
	12.30 am	Lunch	(45 min)
5.	1.15 pm	Nutrient impact analysis	(30 min)
6.	1.45 pm	Brief items: maintain or improve, stock exclusion	(30 min)
7.	2.15 pm	Ecosystem Health	(30 min)
	2.45 pm	Afternoon tea	(15 min)
	3.00 pm	Ecosystem Health continued	(2 hr)
	5.00 pm	Meeting close	

Science and Technical Advisory Group Meeting Minutes

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Officials: Jennifer Price, Kohji Muraoka, Karwin Perez, Nik Andic, Stephen Fragaszy, Martin Workman, James Hogan, Carl Howarth (from 2:15pm)

Apologies: Jamie Ataria, Ra Smith, Tanira Kingi, Dan Hikuroa, Mahina-a-Rangi Baker

Items:

1. Consultation Debrief

Officials and STAG members provided an overview of their experiences with the consultation process for the Essential Freshwater Package.

- Misunderstandings and misconceptions around the rules, indicate a need for better science communication. In particular:
 - Nutrient rules were unclear for people. There is confusion about where the 1mg/L requirement for DIN applies.
 - Questions were raised about the sediment regulations and their application to different river types, in relation to natural variation.
- Concerns were raised about the impacts of the proposals at the individual farm level
 - Several STAG members suggested a more focussed consultation with farmers would have been helpful.
- A horticulturalist in the Manawatu raised concerns about conflicting requirements between the National Policy Statements for freshwater management, urban development and highly productive land.

Marc Schallenberg gave a summary of the recent Freshwater Leaders Group (FLG) meeting.

- FLG prepared a letter about how they might change points of view in light of submissions
- For technical issues in submissions, would like to hear back from STAG.
- FLG was concerned about discrepancies between STAG recommendations and NIWA submission.

2. Plan for the next few months

Ministry for the Environment (MfE) officials outlined the plan for STAG, and the wider MfE work programme over the next few months.

Clarifying the role of STAG:

- STAG is a group of specialists whose role is to provide science advice. It is the role of the Independent Advisory Panel (IAP) to make recommendations based on the submissions.
- It is not within STAG's ambit to consider the costs of implementing or meeting the policy.
- However, it is STAG's job to consider the technical details of how the policy is implemented.

Plan for the next few months:

- The current policy must be passed within tight timeframes. The major milestones in the next few months are expected to be:
 - The IAP report due in the middle of February
 - The Cabinet paper due in late March/early April
- STAG will need to provide targeted advice by forming into subgroups with specific tasks. The groups will provide written advice to the panel. The larger group will then meet again in January.
- The IAP may also question STAG members directly.

Action	For
Book meetings	MfE

3. Sediment

MfE summarised the issues raised in the submissions as well as the ones for discussion on the day. Key questions about sediment attributes were included in the paper circulated to the members.

Key Questions for STAG:

1. Does STAG wish to consider technical issues about the attributes other than those described in this section?
2. Is STAG willing to participate in a workshop with council and research stakeholders as described above? If so, what process would STAG suggest for member involvement and reporting back?
3. Does the aquatic community deviation method require further review, validation, or explanation before results using the method are adequately robust for use in setting public policy?
4. Are results from the extirpation analysis appropriate for setting bottom lines? If so, are the ecological impact thresholds used in the extirpation analyses from Franklin et al (2019) appropriate for setting bottom lines and bands?

Discussion points for sediment attributes:

- The attribute thresholds proposed in the regulations come from a report that MfE commissioned from NIWA and Cawthron.
- The NIWA/Cawthron approach used available water quality and ecological data (with their attendant limitations) for determining ecological health outcomes due to increasing suspended and deposited fine sediment.
- As such, STAG needs to consider how the attributes will be implemented.
- Classification can be revisited, but reducing the number of classes can introduce an 'unders and overs' issue.
- Scientists always operate under a level of uncertainty. It is unlikely that STAG would want to change assessment of technical work.

- STAG's work to date has been responding to existing technical work and it is STAG's role to provide advice on technical considerations.
- General discussion ensued about the sending questions back to the original authors.
- The method on which proposed sediment bottom lines and bands was selected based on a documented decision making process. There is a need for STAG to focus on defining good ecosystem health. The Dairy NZ submission stated a preference to use the bottom lines and bands resultant from the extirpation method as presented in the NIWA/Cawthron report. Use of one method versus another relates to the appropriate ecological end-points for the regulation.
- It was suggested that detailed technical submissions should go back to the original authors, and that STAG should act as a reviewer of the authors' responses. Similar to the process in place for academic journals.
- The chairman furthered this line of thought, stating that where the work was done by others, it makes sense to send it back to them for comment.
- The integration of the multiple lines of evidence presented in the NIWA/Cawthron report was undertaken through a two day workshop. A United States EPA expert facilitated this process, and the process and outcome is laid out clearly in the NIWA/Cawthron report. Six researchers were involved in the weight of evidence process.
- STAG agrees that suspended sediment is a major issue for assessment of stream health and turbidity was chosen to measure suspended sediment. And that the 20% community deviation figure should be reviewed.
- Issues with turbidity can be dealt with via stricter NEMS standards. Work is currently ongoing, eg, there is an Envirolink proposal on benchmarking turbidity meters.

Outcome:

- It was agreed that MfE would commission a peer review of the aquatic community deviation method. This review would be provided to MfE, STAG, and the original authors, and the authors would have the opportunity to provide a written response, which would be provided to STAG.
- MfE suggested that a workshop should be conducted in January to discuss technical aspects of the proposals with council technical staff. STAG supported this and member attendance can be confirmed when the workshop plans are made.

Discussion points for 20% deviation:

- Discussion about what the aquatic community change bottom line should be for sediment.
- Currently, it is stated to be a 20% "change" in a community.
- Questions arose about where the 20% figure came from, and whether it's an arbitrary number.
- According to one member – there is support for the 20% figure, as it is used both in New Zealand and overseas. What is the sensitivity of the score that 20% is applied to?
- The Australian and New Zealand Guidelines for Marine and Freshwater Quality (ANZG – formerly ANZECC) use this approach.
- Is the 20% consistent across attributes? Percent deviations have not been done across other attributes.
- Should 20% change across the board be tolerated? It is important to remember that different attributes need to be treated differently.

- 20% community change for sediment is different to 20% effects for toxic compounds. For this reason, several members argued that an 80% bottom-line for nitrate is too lenient.
- There was discussion about the level of precaution that has been included in the 20% community change. The community change metric is based on a regression incorporating predicted reference state, which is taken from the median model output indicator value.
- Some members argued that this was not precautionary enough as it would mean that half of the measurements would be worse than the median. It was recommended to ask the report authors to explore using a percentile approach.
- One member commented that there is wider consideration needed of where and how precaution is built into the attributes, ideally this should be consistent among attributes.
- It was raised that the 20% threshold may be under-protective for some river classes.
- A STAG member raised that the MCI bottom-line of 90 lines up with a 22% deviation from the reference state. A more precautionary confidence interval could be applied.
- One STAG member commented that the 20% deviation must be reviewed further. Is this the principle that STAG is adopting?
- The chair raised that the 20% deviance figure would be relevant for harmonising attributes, and as such should be dealt with by a STAG subgroup.

Outcomes:

- STAG discussed and agreed to the 20% deviation of community change.
- Further work on deposited sediment classes will be requested from the report authors.

River Environment Classification discussion points:

- STAG notes that submissions raised the point that all parts of the digital network should be included.
- This may require the amalgamation of some river classes to get enough data, as well as to capture rare river types that are missing from the current classification.
- This has been discussed with the authors of the original river environment classification report. It can be done.
- STAG agrees on the uniform offset approach in relation to the community deviation method, but wishes to discuss with the report authors the level of precaution.
- Questions of precaution will be sent back to the original authors.

Discussion points for measurements:

- It was elaborated by a STAG member that using visual clarity as a measure means that it becomes more complex to get measures from larger and faster rivers using black disc measurements.
- Turbidity is easier to measure, and can be monitored continuously.
- Questions were raised about how to continuously measure turbidity. Accurate measurements are lacking.
- It is reported that there is up to a 5 fold difference in analysis between turbidity measuring instruments.
- Guidance would be welcomed in applying continuous monitoring regimes.
- MfE officials clarified that the intent is to refine the definition in the attributes to allow for continuous monitoring, but not require it.
- Further work would have to be done to refine the technical details for any methods of continuous monitoring.

Outcome:

- It was decided that discrepancies in measuring techniques (discrepancy between monthly measurements and continuous measurements, and discrepancy between different types of continuous monitoring methods) should be discussed at the implementation workshop that has been raised as an action for January.

Action	For
Commission a peer review and, subsequent to its completion, return to original authors with core questions about method robustness and sensitivity as well as to respond to comments from submissions.	MfE
Commission analysis of deposited sediment classes and, using observation dataset, assess whether there is systematic or class-specific under- or over-protection.	MfE
Set up a workshop in January to discuss indicators (visual clarity and turbidity through NTU or FNU), monitoring methods for deposited sediment, attribute measurement statistics and timeframes along w/ technical issues like regional council implementation.	MfE
Provide a worked example of how sediment attributes would be applied in a Freshwater Management Unit	MfE

4. Nutrients

MfE gave a summary of the key points from the consultation process.

Key questions for STAG:

- For the bottom lines of 1 mg/L for DIN and 0.018 mg/L for DRP, in how many places will we be overestimating or underestimating the impact on ecosystem health?
- What is the ecological benefit of further reducing DIN and DRP if good 'ecological status' (e.g. ecosystem health components in a healthy state) can already be demonstrated?
- The Freshwater NPS contains an exception for naturally occurring processes. What methods and approaches does STAG recommend for separating the human-induced and natural components of water quality measures? Is the method in McDowell et al. (2018) suitable?

Discussion points:

- Key concerns arose regarding the current management regime, particularly around the use of exceptions. When regional variation is accounted for, there is concern that blanket rules may be too permissive in certain catchments and too restrictive in others.
- It was raised by several STAG members that there are reports of sites where high nutrient levels are reported alongside good ecosystem health. This point was discussed in the context of MCI. There are a group of sites that are in the excellent range for MCI, and these have a range of nutrient concentrations.
- Discussion about the relationship between MCI and nutrients. Some members argued that the MCI can be a misleading measure of nutrients due to the aforementioned high nutrient sites; while others argued that there is a general acceptance across the scientific community that high nutrient levels are related to low MCI scores. However this isn't a 1:1 relationship.

- It was underscored that MCI values do not summarise everything in a river, and that it is also important to understand flow-on effects on receiving environments.
- MCI is not the only relationship feeding into the DIN and DRP attributes – there are also other measures that can be used to assess ecosystem health.
- Nutrients have a variety of effects on different organisms from heterotrophic bacteria to invertebrates. For example, studies in Australia showed that shredders, when exposed to high nutrient concentrations increased in size by up to 60%. It was highlighted that this could have flow on effects across fish and other organisms along the trophic chain.
- As per Liebig's law of the minimum, the limiting factors in a system may not always be nitrogen or phosphorus.
- There are a number of 'levers' for managing ecosystems and there isn't always a clear linear/mechanistic relationship between particular variables in an ecosystem.
- There will always be anomalies, for example in Horizons, sites where high periphyton would be predicted don't always exhibit it because of cold water temperatures and steep topography.
- There was agreement that anomalous sites should be treated with caution.
- One member emphasised that even if the ecosystems in high nutrient environments are nominally healthy, their nutrient loads may still negatively affect downstream linked systems.

This discussion led into questions about peer reviewing, data transparency and communication:

- STAG agrees that aside from a peer review process, there needs to be clear documentation with all the technical detail, including reasons for choosing particular regression methods etc. STAG will collate a technical paper detailing the derivation of the DIN and DRP attributes, including the data sources and methods that were used. The paper will also include responses to technical issues raised in submissions.
- The group discussed the process for writing and reviewing the technical paper on the derivation of the DIN and DRP attributes. The paper will be written up by a sub-group, then reviewed by STAG. STAG will then make a decision about further peer review.
- The group is supportive of seeking peer review for all recommendations and prioritising the attributes that received the most feedback.

Outcome:

- Group agreement that peer review is critical.
- Work on the DIN and DRP attributes will continue in a small group. Adam and Russell will lead preparation of the technical paper to present back to STAG for review.

Discussion points on DIN bottom-line:

- A member expressed confidence in the DIN value of 1 mg/L in relation to the toxic effects of nitrate, due to the rigours of the ANZG process that had led to the derivation of the nitrate toxicity guideline.
- Some submissions argued that the bottom-line should be raised to 3.8 mg/L, as this would still allow for protection of 90% of species from toxic effects.
- It was underscored nitrate toxicity is not an issue in isolation.
- STAG clarified that the intent behind this limit was wider ecosystem health and that the number was derived from multiple lines of evidence.

- Some STAG members suggested that since ANZG have already tested for toxicity, why not copy it across into the regulations? Further questions were raised about the applicability to NZ ecosystems in particular.
- There is also interest in clarifying the ecosystem impacts of DIN at lower concentrations.

Outcome:

- Parallel process for reviewing toxicity was suggested. MfE is working with NIWA to progress this.

Discussion on DRP and regional variation:

- MfE raised submissions feedback about DRP and reference state.
- There are clear differences between North and South Island rivers, in terms of geomorphic character and underlying soil/bedrock characteristics.
- A member of the STAG raised that there should be separate categories for North and South Island rivers, but is uncomfortable with the REC approach because not all classes have adequate data representation.
- The chairman clarified that this had previously been considered by STAG, and that STAG concluded that this can be managed through the exceptions regime.
- Issue of volcanic soils and their relationship to the natural levels of DRP in a catchment.
- There is conflicting evidence over the relationship between DRP and underlying rock types.
- A general discussion ensued about how to categorise different DRP bottom lines.
- Some rivers had DRP concentrations well better than the bottom line. However, one member commented that many of these rivers would have no headroom to increase discharges of P under the Maintain or Improve proposals.

Action	For
Set up a peer review process for STAG recommendations	STAG and MfE
Set up a subgroup to collate data into a technical report - which will discuss the evidence base and methodology behind the DIN/DRP bottom lines.	Russell Death, Adam Canning, Clive Howard-Williams, Chris Daughney, and Ian Hawes MfE to support
Send key science questions, around DIN and DRP, to Adam and Russell	MfE

Periphyton

Discussion points:

- Some councils have suggested that they manage their periphyton using other means such as shading.
- STAG however, does not endorse this position, as it does not address the nutrient imbalances in the system.
- STAG supports Ton's approach to estimate nutrient concentrations to manage periphyton, in the absence of regional models.
- However, STAG members suggested that a review of the periphyton attribute should be conducted.

- The major studies feeding into the existing periphyton attribute were conducted in 2003/2004 and a lot of periphyton data has been collected since then.
- As such both the earlier and later data should be subject to a review, particularly in regards to the levels for attributes like chlorophyll a, in Appendix 2 of the NPS.

Action	For
Conduct further discussion on the periphyton attribute, at a later date	STAG

5. Economic Impact Analysis of Nutrient Policy

James outlined the approach to the impact modelling and provided a paper¹ which showed the approach taken. The model includes impact assessments across various domains from regional economies and environment outcomes to factors like social, community and cultural enjoyment.

Discussion points:

- Change in land management practice was put forward as a key mitigation strategy.
- A member pointed out that while the model includes nutrient impacts from various land use management regimes, it does not account for any potential benefits to farm profitability associated with reductions in stock numbers. Literature shows that reducing stocking rate in some situations improves profitability and reduces GHG emissions, as such this should be included as a mitigation measure.
- A few other members agreed with this assessment, further elaborating that in order to provide for positive outcomes, the right mitigations must be in place.
- Further evidence to support this assessment was mentioned, outlining Our Land & Water Science Challenge's research that profits can increase alongside a decrease in stocking rates.
- It was further elaborated that the focus of the model was to show how to work the proposals into existing land use activities.
- This drew some criticism about promoting 'business as usual'.
- How do you define catchments? Previous work has used FENZ 4th order catchments to look at where leaching comes from.
- It was clarified that data feeding into analysis came from NIWA's modelled water quality state 2013 - 2017.
- It was brought up that the modelled data is good at showing regional variations at a coarse level, but is not accurate at a river scale.
- A member raised a question about the level at which tributaries (eg, Waikato sub-catchments) are being addressed in the model. Do the maintain/improve requirements apply to individual river reaches?
- The same member has already worked out land use in catchments all throughout the country. They volunteered to share their data.
- The chair then raised questions about when the analysis stops. Does it end once all mitigations have been attempted?
- The response was that in that case, there will be further assessment about how much the mitigations had improved water quality, and how much improvement was still required.
- A few members forwarded critiques, citing that the model does not take into account GHG's nor human health impacts.

¹ Hogan, J. 2019. Memo: Science Technical Advisory Group – Proof of concept model for Essential Freshwater environmental impact assessment. Paper provided to STAG as additional meeting document.

- Further, the point was raised that an output is based in dollars and that it would be prudent to incorporate uncertainty into the equation to give a range of results.
- Monetary costs of mitigations were taken from Richard McDowell's estimates.
- Points were raised about attenuation, particularly in how the model accounts for lag time and loads to come.
- This is another source of uncertainty, as regional intercepts in McDowell's estimates are variable.
- Would be good not to include the regional intercepts as fitted parameters.
- One member offered to help further, as they have layers regarding stock density.
- Lakes and estuaries as receiving environments - they might be the most sensitive and drive objective setting.
- It was underscored that the model is a spatial regression. Load to come currently can't be included, and the model has to be based on existing information.
- It was underscored that that the model uses a Pollution Export Coefficient model, which is a type of modelling that connects pollution to land activity.
- Further questioning arose around the variability of leaching present across different farm, soil and land use types. How does the model handle that amount of variability?
- One member suggested looking at and incorporating other models from NIWA and Motu.
- For the current model, LUCI was looked into, but the timeframes precluded inclusion of Motu's models.
- There has been a lot of work done relating N and P in rivers to land use and some work done on the effects of mitigations, and what the hot spots are. There's unease that this analysis will be following a different methodology. STAG would like to see the terms of reference.
- The model is a prototype and is open to change, with suggestions on what to include and what data to incorporate being accepted.

Outcome:

- The critiques will be noted, and considered during further development of the model.
- Adam will share his data regarding land uses around tributaries throughout the country.
- Members will discuss the model further after the meeting.

Action	For
Provide STAG with more background material with specific questions, detailed methods and data layers	MfE
Provide spatial data	Adam Canning
Provide written feedback on model	MfE to follow up with all of STAG

6. Brief Items: maintain or improve, stock exclusion

Maintain or Improve

MfE provided an overview of the key themes from the submissions.

Discussion points:

- Submissions raised questions around this policy meaning that we are fully allocated. How can we account for urban growth, consent activities etc.
- Fish & Game suggested that water quality should be maintained as at 1991 level, which led to questions about the adequacy of data to calculate the 1991 state.

- MfE will seek advice from STAG about the representativeness of available data to calculate 1991 state.
- A key question is, what are the data requirements for determining the current state of a waterbody? Will require engagement from CRI's and councils for further modelling and the acquisition of past monitoring data.
- Further questions arose about how to target policy to account for lag-time effects on waterbodies, and differing levels of attenuation across and between catchments.
- STAG members requested a worked example – how do you meet the requirements of the proposals relating to Maintain or Improve?
- This theme will likely be explored further, in later meetings.

Action	For
Send questions to STAG subgroup before December	MfE
Set up a sub-group meeting by, either by Skype or in person, for January	MfE

Stock Exclusion

MfE provided an overview of the key points from the submissions on stock exclusion. MfE is progressing work on the pathogen and sediment reduction implications of the proposals.

Discussion points:

- Questions arose about the origin of the 5 m setback distance. There is no justification from published research for a single uniform setback figure, but a table of setback distances has been published, which includes circumstances where 5 m might be appropriate.
- MfE clarified that 5 m is not a blanket setback distance, but an average setback goal. The distances may be wider in some areas and narrower in others, depending on the conditions.
- Questions arose about why the setback requirements focus on streams wider than 1 m, since smaller streams account for a greater contaminant load overall.
- Officials responded that setbacks for narrower streams would be addressed in individual Farm Environment Plans.
- A member commented that there's a lot of existing science to support the setbacks; however, difficulties arise when it comes to applying policy effectively.
- The Australian EPA has a set of rules for managing setback distances and there are tools available to assist with planning setbacks, like a riparian planner for farmers. However, regional councils have attempted to include these in previous plans, and have found that they are complicated to apply as planning rules.
- Likewise, planners find it difficult to apply complex land and slope equations into their plans.
- Further discussion occurred about what techniques could be applied to give effect to the policy. Further work is needed, but different suggestions were put forward, such as mapping rivers to target the setbacks, and creating trigger criteria for works to be done.

Outcome:

- STAG is willing to engage in a targeted way, but must first understand the objectives of the policy. STAG recommended that a sub-group, which includes FLG, farming and STAG representatives, be set up to engage with this topic.

Action	For
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Prepare targeted questions for a meeting in January	MfE
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7. Ecosystem Health

Dissolved Oxygen (DO)

Key questions:

1. For dissolved oxygen in rivers, is there sufficient natural variation to warrant the creation of different attribute states for different river types? Is the evidence base sufficient to do so? (see Hawkes Bay Regional Council submission below)
2. Would percent saturation be a more suitable measure of dissolved oxygen than concentration? Why/why not?
3. Lake dissolved oxygen – we think that the topics raised in submissions have been discussed by STAG, and have no specific questions. Is there anything else STAG wants to add?

MfE provided an overview of the submissions regarding DO

Discussion points on DO:

- Discussion about whether to classify rivers by DO
- Wetland DO is dependent on wetland type. This is due to factors like flow and groundwater upwelling.
- DO would depend on geography, as well as on macrophytes and deposition.
- A member would like to see data supporting the argument re: depositional environments; particularly at a national scale (may indicate whether any issue could be dealt with by exception). Other members suggested there is probably not enough information to do that.
- A member replied that there probably aren't enough naturally anoxic streams in the country to warrant an exception.
- HBRC submits that there are many rivers that are naturally anoxic. The natural exceptions regime in the NPS would come into play in this case.
- STAG recommends that naturally low DO can be managed by the existing exemption in the NPS.
- A member observed that low DO depositional streams may in fact be drained wetlands (as stated in HBRC submission), as opposed to naturally low.
- Submissions also raised calls to express the attribute in units of oxygen saturation, as this is what fish respond to.
- One member noted a NIWA report prepared for the 2014 NPS was relevant (Davies-Colley et al 2013: <https://www.mfe.govt.nz/sites/default/files/national-objective-framework-temperature-dissolved-oxygen-ph.pdf>)
- STAG members disagreed that saturation is more relevant, and noted that this issue had been addressed when the DO attribute was introduced. Temperature changes saturation, therefore concentration would be more relevant than saturation at higher temperatures.

Action	For
Send out a statement addressing points made by submitters relating to DO	Clive Howard-Williams, Marc Schallenberg, Jon Roygard

Lake DO discussion points:

- Some submissions say there isn't enough information already, therefore it shouldn't be in the NPS.
- Discussion about the level of existing monitoring data required to introduce an attribute, and whether it is justified to have attributes in the NPSFM to drive monitoring.
- Uncertainty about how to use thermal profiles to work out hypolimnetic boundaries. Could be addressed in guidance.
- Could specify that people need to use published methods. Submissions say that more work is needed, but one member's view is that this is easy to address.
- The chair summarised that STAG still recommends that we measure and manage these attributes. STAG had several caveats relating to this attribute that have not been included in the draft NPS - these will go into guidance.

Outcome:

- STAG will not deviate from its original recommendations on lake DO.

General Ecosystem Health

MfE gave a summary of the issues raised in submissions.

Discussion points:

- MfE officials asked, are there redundant attributes that could be removed?
- While not all attributes need to be measured at every site, it is still vital to include the 5 core components of ecosystem health.
- At different sites, some attributes will be more important than others.
- Not everything needs to be measured at all sites – there may be different monitoring networks for different attributes.
- STAG concluded that the attributes are complementary and all are necessary to manage ecosystem health.

Ecosystem Metabolism

Key questions:

1. We think that the topics raised in submissions have been discussed by STAG already and we have no specific questions. Is there anything else STAG wants to add?

Discussion points:

- A few STAG members queried the status of this attribute. MfE has included an attribute in the draft NPS with no attribute bands or bottom line.
- In their report, STAG recommended an attribute table with bands but without a bottom line. The group was not certain about where the bottom line should be, and noted that this recommendation will need to be revisited as more data becomes available.
- No substantial reason to change recommendation.

Outcome:

- STAG retains its recommendations regarding Ecosystem Metabolism.

Fish

Key questions:

1. We think that the topics raised in submissions have been discussed by STAG already and we have no specific questions. Is there anything else STAG wants to add?

Discussion points:

- Discussions about whether introduced salmonids should be included in the measures of Fish IBI.
- One member argued that salmonids fill ecological niches that require a high level of ecosystem health. Since Fish IBI is a measurement of ecosystem health – not nativeness – salmonids should be included in the attribute.
- Another member countered that there may be conflict between providing habitat for salmonids and providing it for indigenous species. If salmonids were part of the attribute, then this would cause issues with managing those sites.
- STAG's approach to the Aquatic Life component of the Biophysical Ecosystem Health Framework was to focus on indigeneity, and that was reflected in their original recommendations to exclude salmonids from the IBI.
- A compromise was suggested. Two columns would be used, one for areas where there are no salmonids, one for areas where there are salmonids.
- An issue for implementing the attribute is that salmonids could be seen a positive in areas where there is a sports fishery for salmonids, and negative in where there are impacts on indigenous species.
- Members expressed support for the two column approach, recognising that in some ecosystems their presence is positive because it indicates healthy habitats while in others their presence is negative because of their predation of indigenous aquatic species.
- There was a discussion about the role of sport fishery management plans.
- What are the requirements for DOC to sign off management plans, do they weigh up the values? What are the effects of the new indigenous fish conservation regulations?
- There was discussion about the ecological impacts of salmonids.
 - Despite filling ecological niches, they may still compete with and/or predate on native species.
 - One member states that impacts on invertebrates is probably only an issue in selected locations.
- Discussion ensued about the responsibilities of regional councils, DOC, and Fish & Game.
- STAG requested further information on this topic.
- Discussion about the inclusion and/or removal of salmonids being a values judgement. It was raised that this is a decision that is best left to the Minister.

Outcomes:

- STAG put forward the option of having a two column approach to Fish IBI, if salmonids are to be included.
- Mike and Adam will have a conversation with NIWA about their submission.

Caveats:

- The chair cautioned that there are still caveats surrounding the inclusion of salmonids.
- Further work is needed around 1) policy settings and 2) ecological impacts.

- Despite the fisheries management plans surrounding catchments with salmonids, there may be a suite of interactions between them and the wider ecosystem.

Action	For
Provide more info on fish management plans and ecological impacts of salmonids for STAG meeting in January	MfE

Hydroelectric Scheme Exceptions

Discussion points:

- STAG has not had the chance to consider in detail the proposal to exempt the six largest hydro schemes from some of the NPS provisions.
- Members expressed concern about the impact of the existing hydroelectric schemes on stream health.
- Officials clarified that the exceptions relate to six specific hydro schemes. These rivers are still under the obligation to maintain or improve.
- It was brought up that this policy applies to 60% of the river volume in New Zealand.
- The policy applies to where the dam is causing the river to exhibit values below the bottom line.
- Questions raised about how far upstream/downstream the effects of the hydro scheme start and end.

Action	For
Send hydro exception RIS back to the group	MfE

Wetlands

Discussion points:

- One member questioned the exclusion of geothermal wetlands from the regulations.
- MfE will follow this up with the wetlands policy lead.

Action	For
Provide further information about geothermal wetlands	MfE

LakeSPI

Key questions:

1. We think that the topics raised in submissions have been discussed by STAG already and we have no specific questions. Is there anything else STAG wants to add?

Discussion points:

- LakeSPI includes a measure of % cover based on transects. Though it doesn't include a vegetation cover map for the entire lake.
- No issues with adding an attribute that measures vegetation composition.

- NIWA recommends an assessment every 3 years for at-risk lakes, and a 5-10 year assessment for lower risk lakes. STAG is happy with NIWA's recommendations around monitoring frequency.
- Discussion about what technologies can be applied used to aid assessment. There is an Envirolink proposal to examine the potential for remote sensing (ie, underwater camera systems).
- Queries about how risk is determined.
- A STAG member replied that a risk management framework for LakeSPI is currently being developed for regional councils.
- It was raised that some councils may want to leave exotic macrophytes in place, as they may have ecological benefits. Lake Horowhenua was put forward as an example of this principle.
- Discussion about what actions can be done to improve LakeSPI.
- Management plans could be put in place that involve the removal/spraying of exotic macrophytes.
- Eradicating exotic macrophytes entirely is unnecessary to reach the bottom lines. Active management is suitable
- Raising the score usually involves increasing the percentage of natives. There was discussion about how that would work across native and exotic species attributes. Would this work with the two separate tables?
- One member raised that taking the LakeSPI from 100 to 90 might not be that beneficial for the ecosystem. Improvement could be difficult.
- There is a need to provide more research and guidance on restoring native plants.
- The chairman cautioned that the attributes may have consequences for some lakes where it may be preferable to leave exotics in.

Action	For
Check the mechanics of LakeSPI scores and follow up at the next meeting	MfE

Macroinvertebrates

Key questions:

1. Is the bottom line of 90 achievable in urban streams? How much more rehabilitation would be required to get 90 as opposed to 80?

Discussion points:

- Some regional councils have their own versions of the MCI. This needs to be standardised, a NEMS for macroinvertebrates is required urgently.
- The standard can be met within urban streams, as such they should be applied equally in urban areas.
- An MCI score of 80 – the boundary for severely degraded – is not regarded as good enough as a bottom line.
- Issues rose around standardising calculations. Should you use MCI, QMCI and ASPM together, or should you use only the worst?
- STAG recommends using the updated MCI scores; this is a point MfE should address in the final version of the NPS.
- MCI and QMCI should be assessed together, and the lower of the two results should apply.
- ASPM is a separate metric and should be assessed separately.

- One member summarised that MCI measures organic enrichment while the other metrics are about overall change.
- To move from 80 to 90, habitat rehabilitation needs would vary between sites.
- STAG is not in a position to fully answer the question as it will depend on local site factors. Some streams would require habitat restoration, and some would not.
- STAG should cross reference previous work done. For instance, there is an Auckland Council report on the MCI bottom line authored by Martin Neale.
- NIWA raised issues around soft bottomed streams. Soft bottom scores should only be used in streams with naturally soft sediments.

Attribute statistics and ecosystem health report card

- There was a discussion on how to progress work on the attribute statistics and ecosystem health report card.
- It was noted that the attribute statistics need to have an FMU focus. This work is related to the Maintain or Improve sub-group work and can be done after January.
- The group were also keen to have input into the ecosystem health report template work and suggested sub-group members.

Action	For
Work on FMU ecosystem health framework, draft a national report card, and make a template for how councils can achieve the policy.	Joanne Clapcott, Bryce Cooper, Chris Daughney, Graham Sevicke-Jones
Work on attribute statistics with an FMU focus	Jon Roygard, Maintain or Improve sub-group

Next meeting

- The next meeting will be in January.