The Integration of Seafood Certification and Jurisdictional Assurance Models

ASC/SFP/SFW Standards and Data Mapping Study

Aquaculture Stewardship Council (ASC)
The Sustainable Fisheries Partnership (SFP)
Monterey Bay Aquarium Seafood Watch® program (SFW)

Prepared by Peter Bridson

Final Report: March 11\textsuperscript{th} 2020

This project was made possible thanks to a grant from the ISEAL Innovations Fund, which is supported by:

\begin{itemize}
  \item \textbf{Swiss Confederation}\noindent\textit{Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra}
  \item \textbf{Federal Departement of Economic Affairs, Education and Research EAER State Secretariat for Economic Affairs SECO}
\end{itemize}

\textit{Disclaimer: The views expressed in this publication are those of the author(s) and do not necessarily represent those of the ISEAL Secretariat, ISEAL members, or donor entities to the ISEAL Innovations Fund.}
Summary

418 discreet environment-related datapoints were identified from the standards and assessment documents of the Aquaculture Stewardship Council (ASC), the Sustainable Fisheries Partnership (SFP), and the Monterey Bay Aquarium Seafood Watch® program (SFW). The basic alignment of these datapoints across the three schemes was assessed (i.e. how many of the schemes used each datapoint), but in order to fully understand the nuances of the overlap or alignment of data across the schemes, several important characteristics of every datapoint were analyzed (the applicable scale, timeframe of data desired, importance, sources, and collection methods).

It is important to note that in contrast to previous benchmarking, alignment or mapping exercises of these schemes (which have focused on the requirements of the standards, their performance, and their relation to the outcome of assessments), this analysis was led entirely by the data or information needs associated with the standards of each scheme. The importance of robust data to the schemes was highlighted by the recent case of data fabrication by Nova Austral in Chile and the subsequent withdrawal of ASC and SFW recognition.

The data mapping exercise showed some similarities and alignment in the basic datapoints used by the three schemes; of the 418 basic datapoints across 12 different content/impact sections, 36% of datapoints were exclusive to only one scheme, 58% were common (i.e. aligned) to two schemes, but only 6% were aligned across all three schemes. When the detailed characteristics of each data point were analyzed, they provided a comprehensive mapping of each scheme’s content and illustrate nuanced differences between the applicable scales of the data used (from pond level to global), between the timeframes of data desired and of the data subsequently used in an assessment (from the last 12 months to several years), between the importance and associated flexibility in data (e.g. some data points are essential such that an assessment can’t be completed without them, others are optional), between the sources of data (from the farm to a diverse array of sources), and finally between the data collection methods (from direct contacts and data requests to a variety of other active and passive methods). For a scheme-specific summary:

- **ASC:** The datapoints used in an ASC assessment (i.e. audit) are specific and precise. They cover a primarily fixed 12-month timeframe and have a minimal number of sources of which the farm is dominant. Almost all datapoints are essential (i.e. the assessment can’t be completed without them), they relate almost exclusively to the site level, and are intended to be straightforward to gather by the farm. The data gathered are typically not publicly available but are increasingly available in audit reports. With the second-highest number of datapoints all applied at the site-level, collectively they represent a detailed picture of farm-level practices and impacts. The basic ASC datapoints have some alignment with SFW (26% of all datapoints), but not with SFP (2%).

- **SFP:** The datapoints used in a SFP profile are less precisely defined than ASC but more flexible, and are distinguished by their focus on governance. While some governance aspects are overarching, SFP intentionally covers less of the specific impacts and has the lowest number of specific datapoints of the three schemes. Many of the SFP datapoints relating to governance are simply defined, yet complex to gather and assess. All the data referred to by SFP must be publicly available. Collectively, they build a picture of governance content and effectiveness at the provincial scale. Like SFW, many different data sources are used, and an assessment can be made in the absence of data. SFP has some alignment with SFW (30% of all datapoints) but not ASC (2%).
• **SFW**: The datapoints used in a SFW assessment are also less precisely defined than ASC but more flexible. In contrast to ASC, an assessment can be made in the absence of data, and like SFP, an absence of data is a defined scoring characteristic in the standard. The timeframe of the data used is variable and while longer timeframes are used to indicate trends, the most-recent 12-months data timeframe used by ASC is often not available. SFW has the highest number of environmental datapoints, and many are complex to gather and assess. The data used are typically publicly available, or permitted to be published in a SFW report. SFW uses a wide variety of data sources, and the datapoints collectively represent a bigger picture of “typical farm” practices at the industry/country level. The basic SFW datapoints have some alignment with both ASC (26% of all datapoints) and SFP (30%).

When the additional data characteristics such as scale and timeframe were considered in addition to the basic datapoint name (e.g. “annual mortality % at the farm-level” verses “annual mortality at the country-level”), almost all alignment disappears and there was minimal specific data alignment between the three schemes (i.e. the percentage alignment figures stated above drop to zero). The lack of alignment of data characteristics was largely considered to be due to the fundamental differences in each scheme’s modus operandi (i.e. the ASC focuses on responsible farm-level practices, SFW focus on impacts at the industry/country scale, and SFP focuses on governance at the provincial scale).

These fundamental differences provide a huge potential for greater data alignment. For example, where the data collected are the same, there is potential to streamline collection, to fill gaps, and to benefit from scheme-specific relationships with data providers or sources. Where the data collected are different, there is the potential to build a more robust understanding of production practices and impacts. Where the data collected apply at different scales, there is the potential to build a more robust understanding of farm-level and industry contributions to cumulative impacts. Where the data collected have different sources, there is the potential to crosscheck, consider different perspectives and reduce scheme risks from using corrupt data. And where the data collected have different timeframes there is the potential to better understand trends, annual or cyclic variability, and the representativeness or robustness of the most recent datasets. Practical suggestions have been made in two areas of potential benefit: efficiency and scalability.

Improved efficiency can lead to reduced assessment times and costs, acquisition of better (more complete, robust, up to date etc.) data, a reduction in direct requests to data providers, improved scoring decisions, and more accurate outputs. Options include:

• Improved availability and sharing of feed data, potentially with a formalized feed data platform building on existing feed databases, and potentially with additional organizations or stakeholders.
• Greater availability or sharing options for ASC farm-level audit data.
• Greater utilization of ASC farmer knowledge on local production practices and characteristics, local monitoring and (perhaps otherwise obscure) data resources.
• A shared list or database of data sources and resources at a provincial or national scale.
• A document repository or reference list for key papers, reports or other relevant materials
• A governance database, with a focus on the practical application and functionality of (typically opaque) regulatory or other governance measures at the provincial or national level.

The options have a variety of benefits and/or additional workloads for the three schemes and may link to other workstreams being pursued by the schemes. They could be tested with pilots for key aquaculture regions or for select species.
Improving scalability has the potential for more profound changes to each scheme’s modus operandi by deliberately utilizing the dominant differences between the three schemes; that is exploring and finding ways to utilize the farm-level focus of the ASC, the country/industry level focus of SFW, and the provincial governance umbrella of SFP. Options include:

- The use of SFP and SFW provincial or country-level scores (particularly low or “red” scores) as ASC risk identifiers (e.g. within the ASC Biodiversity Inclusive Environmental Impact Assessment)
- The use of larger scale data from the provincial governance profiles and SFW country/industry assessments by ASC to review cumulative industry impacts in a waterbody or region in which individual farms are ASC-certified.
- The use of data from multiple ASC-certified farms to inform the “typical farm” or company governance in SFP/SFW area-based assessments.
- The use of SFP and SFW “typical farm” or provincial assessments to identify where and how ASC-certified farms excel.
- Greater utilization of SFP’s Governance Profile by ASC and SFW to put farm-level practices or cumulative impacts in a governance context.
- Utilizing the larger multi-farm and long-term datasets assessed by SFP and SFW to better understand farm-level trends and spatial or temporal performance variability.
- Identification of reputational risk to schemes resulting from additional impacts that occur outside the scope of the scheme’s standards.
- Awareness of and potential engagement in the additional workstreams underway in the three schemes.

These potential efficiency or scalability projects could be pursued discreetly using rudimentary scheme-scheme processes, or alternatively, a variety of platforms could be conceived and potentially shared with additional organizations (e.g. potentially utilizing existing examples such as the International Aquaculture Feed Formulation Database or the Sustainability Impacts Learning Platform). Nevertheless, it is important to note that the modus operandi of the schemes are discreet somewhat by design, the realities of many of these projects are conceptually complex, and there must be a “burning desire” for a substantial mutually beneficial outcome if progress is to be made.
1. Introduction

This assessment has been undertaken as part of the ISEAL Innovations Fund project: *Streamlining the path towards sustainability in the aquaculture industry, Integration of seafood certification and jurisdictional assurance models*. The collaborators in this case are the Aquaculture Stewardship Council (ASC), the Sustainable Fisheries Partnership (SFP), and the Monterey Bay Aquarium Seafood Watch® program (SFW).

The focus of the work presented here with regard to the three schemes is: “to improve the consistency of the data they collect and the ways in which they apply this data”, in the context that: “To do the work of monitoring and evaluating seafood production, all three schemes must collect extensive information, a process that can prove costly and time-consuming, particularly for farmers who manage multiple and often overlapping data requests from the various systems. By streamlining the information that’s collected and deployed, producers will find it easier and less costly to comply with the requirements, while also improving the systems’ abilities to assess the long-term impacts that their standards are having on the aquaculture industry” (Quotes from the ISEAL Alliance).

This report presents an analysis of the data alignment and complimentary data aspects of the three schemes. It is important to note that in contrast to previous benchmarking, alignment or mapping exercises between these schemes (which have focused on the requirements of the standards, their performance, and their relation to the outcome of assessments), this analysis is led entirely by the data or information needs associated with the standards of each scheme. As such, the corresponding metric values or scoring requirements of the standards were ignored\(^1\), and the focus was on identifying the types of data used and how they are collected and applied, thereby seeking to identify areas of complementary alignment.

The data and different types of information used by the schemes vary across a complex suite of variables; for example, they vary across their scale of relevance (from a single pond to a country), their scope (the various different impacts addressed), their units, preferred timeframe, utilized timeframe, and sources, and also in the essential, desirable or optional status in each scheme’s assessments. In addition, with regard to the burden of multiple or overlapping data requirements, the active versus passive pursuit of data is important; i.e., which data are obtained by direct contact and requests versus those obtained by active indirect collection from (e.g. from an online database or academic paper). When combined with the different sources of data, an analysis by method of collection can give an indication of who or which organizations may be getting repeated direct requests for information.

The standards dictate (in varying degrees of specificity) the data and information to be used by the auditors/analysts, but other people directly involved with the schemes such as reviewers, peer reviewers and consultants may also obtain similar types of data in some cases. In addition, a potentially quite different set of data and information are used by the standards writing teams of each scheme and/or their technical committees etc. Beyond that, additional workstreams or external projects undertaken by the collaborators may also have overlapping data and information needs (for example the overlap between SFW’s Aquaculture Governance Indicators project and the governance aspects of SFP’s scoring methodology, or overlaps in region-specific projects in SE Asia). To maintain focus, the

---

\(^1\) For example, various aspects of the datapoint “mortality rate” were assessed across the schemes, but the different metric values of “mortality rate” relating to different scores in the SFP methodology, or the specific values required to be certified to the ASC standards, were ignored.
scope of this analysis (at least initially) is on the direct audits/assessments made by the primary auditor/analyst according to each scheme’s standards. It is also useful to note here that the audit and assessment reports generated by each scheme represent data sources in their own right that are used (or could be used) by other schemes. This aspect is an important part of this analysis.

Finally, it is important to recognize the importance and sensitivity of the data used by each scheme and their reliance on it for their organizational reputations. The case of data fabrication by Nova Austral in Chile and the subsequent withdrawal of ASC and SFW recognition highlights the “data quality” aspect across the schemes. These aspects and others are analyzed and discussed in the following sections.

2. Analysis Methods
With regard to the primary project deliverable (An analysis of the three schemes that identifies where there is overlap or alignment in 1) the standards content, and 2) the information/data required), a comprehensive mapping exercise of all potentially relevant data characteristics was completed. A detailed explanation of the methodology is provided here for reference.

2.1 Terminology used in this report
Data – used here as a general term representing any type of information or data used by the schemes
Datapoint – used here as a flexible interpretation of the singular “datum” (defined as a piece of information) relating to any discreet or specific piece of data or information in the analysis represented by a numerical value, text field, yes/no answer or any other specific measure.
Assessment – used here as a general term encompassing an ASC audit and a SFP/SFW assessment, i.e. the process of gathering data.
Standard – used here as a general term to refer to the primary scheme assessment documents analyzed here; that is, including ASC and SFW’s standards and SFP’s scoring methodology.

2.2 Focus on Data (not Standards)
As noted in the introduction, it is emphasized again here that in contrast to previous benchmarking, alignment or mapping exercises between these schemes that were driven by comparisons of the standards content, their performance requirements and their outcomes, this mapping exercise was driven primarily by the data only. While the relevant indicator numbers (e.g. 6.1.1) for each datapoint were recorded as part of the alignment analysis, the main focus was on the data points themselves and their respective characteristics across the schemes.

2.3 Datapoint Characteristics
In order to more fully and constructively understand the nuances of the overlap or alignment across the schemes, several important characteristics of every datapoint were recorded and categorized across the three schemes:
Table 1: Datapoint Characteristics

<table>
<thead>
<tr>
<th>Datapoint characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Datapoint name (e.g. mortality rate)</td>
<td></td>
</tr>
<tr>
<td>Standard element(s) of relevance to the datapoint (e.g. ASC 6.1.1)</td>
<td></td>
</tr>
<tr>
<td>Metrics/units (e.g. percent)</td>
<td></td>
</tr>
<tr>
<td>Scale of relevance (e.g. farm, province)</td>
<td></td>
</tr>
<tr>
<td>Timeframe of data desired (e.g. previous 12 months, 5 years)</td>
<td></td>
</tr>
<tr>
<td>Timeframe of data used (e.g. 2 years, variable)</td>
<td></td>
</tr>
<tr>
<td>Data sources (often multiple; e.g. farm, government, academic literature etc.)</td>
<td></td>
</tr>
<tr>
<td>The importance of the datapoint to an assessment (e.g. essential, optional)</td>
<td></td>
</tr>
<tr>
<td>Data collection method, allocated to each source (e.g. direct, active, passive)</td>
<td></td>
</tr>
</tbody>
</table>

The applicable data-scale and data-source characteristics were sub-categorized according to the following lists (which are based on the presence or relevance of each sub-category in at least one scheme). Note “Group” is not included in the list of “applicable scales” as the datapoints (with minor exceptions) are primarily the same as those for a single farm (also see the “Scope of assessment” section below).

Table 2: Scales and Sources of Data

<table>
<thead>
<tr>
<th>Applicable scales</th>
<th>Sources of data or information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond</td>
<td>Farm or farming company</td>
</tr>
<tr>
<td>Farm</td>
<td>Industry body or representative</td>
</tr>
<tr>
<td>Waterbody</td>
<td>Government</td>
</tr>
<tr>
<td>Typical Farm</td>
<td>Academic literature</td>
</tr>
<tr>
<td>Industry</td>
<td>Research reports</td>
</tr>
<tr>
<td>Province/State</td>
<td>Certifier (e.g. ASC audit report)</td>
</tr>
<tr>
<td>Country</td>
<td>Hatchery</td>
</tr>
<tr>
<td>Global</td>
<td>Feed mills</td>
</tr>
<tr>
<td>Species</td>
<td>Ingredient supplier</td>
</tr>
<tr>
<td></td>
<td>Personal communication</td>
</tr>
<tr>
<td></td>
<td>Grey literature</td>
</tr>
<tr>
<td></td>
<td>Auditor (e.g. samples taken during audit)</td>
</tr>
</tbody>
</table>

The importance of every datapoint to each scheme’s assessment process was sub-categorized as follows:
Table 3: Descriptions of the “Importance” of Datapoints

<table>
<thead>
<tr>
<th>Importance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential</td>
<td>The datapoint is an essential part of an assessment. Regardless of the datapoint &quot;value&quot;, an assessment can't be completed without it.</td>
</tr>
<tr>
<td>Important</td>
<td>The assessment outcome (e.g. the score) is affected by this data point, but the assessment can be completed without it.</td>
</tr>
<tr>
<td>Minor</td>
<td>This data point may be used in an assessment and may affect the score but is not typically actively sought.</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>If a datapoint used by one scheme is not used by another, by definition it is not applicable to the latter (and left blank in the analysis)</td>
</tr>
</tbody>
</table>

The data collection methods were categorized as follows:

Table 4: Description of Data Collection Methods

<table>
<thead>
<tr>
<th>Collection Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>Direct engagement and data requests to individuals or organizations, with follow up if not delivered.</td>
</tr>
<tr>
<td>Active</td>
<td>Active data collection from passive sources (e.g. from reports, websites, academic literature etc.)</td>
</tr>
<tr>
<td>Passive</td>
<td>No specific effort is made to find this data, but it may be used if found indirectly while obtaining other data.</td>
</tr>
</tbody>
</table>

2.4 Datapoint Identification

With a requested focus on shrimp, datapoints were obtained from a literal and experienced interpretation of the following documents:


In addition, some checks were made for consistency with randomly selected shrimp audit reports (ASC), provincial shrimp profiles (SFP) and shrimp assessment reports (SFW).

Identifying specific data points in often nuanced, for example “Vulnerable to flooding” is a datapoint with a yes/no metric, whereas “Vulnerability to flooding” would be a more complex descriptive text field. Also see the “Sources of error” section below for further information.

Some datapoints are optional in different assessments (for example there are three alternative ways to comply with the ASC feed standards, 7.2.1.a,b,c, and SFW has alternative risk-based or evidence-based options to assess some criteria), and therefore the total number of datapoints is greater than the specific suite used in any single assessment. For the mapping goals of this analysis, the full suite of datapoints potentially used by each scheme are included in the analysis, even if they might not be used in all assessments.
2.5 Scope of the Assessment
It is well established that while some key environmental impacts are addressed by all three schemes, some aspects are only covered by one or two schemes. The following table reviews the impacts directly covered (at least in some way) by each scheme. Non-environmental aspects such as community, labor, food safety, traceability and so on were not included in this analysis.

<table>
<thead>
<tr>
<th>Sections</th>
<th>ASC</th>
<th>SFP</th>
<th>SFW</th>
<th>Assessed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regulatory framework and compliance</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>2 Code of practice/producer organization</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>3 Habitat and EIA</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>4 Shrimp health - disease</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>5 Predators and wildlife</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>6 Treatments - chemical use</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>7 Species and escapes</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>8 Source and movements of stock</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>9 Feed</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>10 Effluent</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Yes</td>
</tr>
<tr>
<td>11 Energy</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>Yes</td>
</tr>
<tr>
<td>12 Wastes</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>Yes</td>
</tr>
</tbody>
</table>

As noted in the introduction, each scheme may have data needs beyond their assessments (e.g. for standards reviews, technical committees or additional workstreams etc.), but to maintain focus, the scope of this analysis (at least initially) is on the direct audits/assessments made by the primary auditor/analyst according to each scheme’s standards.

Specific requirements in scheme’s appendices, e.g. detailed B-EIA requirements in ASC Appendix 1, have not been analyzed for additional datapoints here (for example, the scope of the ASC B-EIA relates directly to ten of the existing ASC indicators, therefore there are not necessarily any additional datapoints that would be missed). Also, although multi-site groups are covered by ASC, the same standards (and datapoints) apply and therefore the specific additional certification requirements for multi sites (e.g. including datapoints such as “number of staff in central office” in Annexes E and F of the ASC Certification and Accreditation Requirements) are considered out of scope for this analysis.

An additional rapid assessment was made of ASC’s Monitoring and Evaluation framework for potential data alignment with other schemes. This was based on alignment of the 94 metrics listed in the framework with the existing datapoints identified from the schemes in the main analysis.

2.6 Language Simplification
Complex standards language and guidance were simplified where possible to its foundational principle for greater clarity. This did not affect the number of data points, with the exception of simplified duplicitous datapoints such as mortality rate versus survival rate which are effectively the same datapoint.
2.7 Sources of Error
Every effort was made to accurately identify and map the characteristics of every datapoint for each scheme; however, there are inevitably some minor sources of error; for example:

- The datapoints in the ASC standard (and audit manual) are typically quite specific, but the data used in SFP and particularly in SFW assessments are somewhat variable or flexible, and not necessarily fully specified in the standard. It is possible that some relevant datapoints are not included in this analysis, or that some specific datapoint characteristics are not fully identified.
- It is likely that a few datapoints are attributed to schemes that may not actually be used in practice, and there is some minor duplication of datapoints in multiple impact sections (e.g. water exchange characteristics apply to several SFW criteria and are included in each for clarity).
- All possible datapoints relating to a scheme’s standard are assessed together here, even though not all of them may be used together in any single assessment (again this applies more to SFW that has different evidence-based, or risk-based assessment options). For the goals of this project to map the scheme’s data characteristics, considering all the datapoints together is correct, but the higher number of datapoints (compared to the number used in any one assessment) may give the impression of greater complexity or topic coverage.
- Any one datapoint may be collected by different methods in different assessments, therefore there is some overlap and/or error in the simplistic categorization and analysis of data collection methods made here.
- Datapoints should not be considered “equal” and are in fact highly variable in their complexity; for example, a datapoint on the availability of a record of water quality is different from the corresponding datapoint(s) relating to the water quality itself.

Overall, these errors are considered to be minor in the overall analysis, and not considered to affect the overall outcomes of the assessment or the conclusions.

2.8 Analysis
The analysis was primarily based on the datapoint categorizations listed above (Section 2.3) across the impact sections listed in Section 2.5, with the aim of mapping and understanding the scope and scale of data alignment across the schemes. This was completed in an excel worksheet which is provided separately with this report. The analysis was straightforward but done in some depth for the several hundred datapoints identified. It builds the foundation for understanding the complex data characteristics across the schemes as described in the results section below. While some detailed analysis has been done across each impact section, the initial analysis is primarily at the scheme level. Substantial further analysis is available by characteristic and impact section if further information is requested.

3. Results
The detailed mapping of all the datapoints and their characteristics is provided in a separate Excel workbook, but given the number of datapoints and the characteristics identified, this inevitably has limited readability. An analysis of various aspects is therefore presented below and provides a lot of information to understand the basic alignment and complementarity of the data across the three schemes. While some of the results are simplistic (e.g. the number of datapoints per scheme) they are included here as the foundation for a robust understanding of the more nuanced aspects. All results presented are rounded to the nearest percentage point.
3.1 Data Diversity

Figure 1 shows the number of datapoints used by each scheme (note these are not all necessarily used in any one assessment). The analysis identified 418 data points related to the environmental aspects covered by the three schemes. Seafood Watch has a higher number of datapoints (336 compared to 211 for ASC and 163 for SFP) due to the most varied assessment options (e.g. risk-based and evidence-based) and the most flexibility in the types of data used in their assessments. SFP has the lowest number of data points due to a lower number of impacts covered, a more specific methodology, and also partly due to the repeated use of a single datapoint in OR/AND combinations and in different scoring categories.

![Number of environmental datapoints used by each scheme](image)

*Figure 1: Number of specific datapoints used by each scheme*

3.2 Basic Alignment

The simplest alignment analysis considers the number of schemes that are aligned on average across the data points based on their datapoint “name” only; that is, what proportion of the data points by name are specific to one scheme, how many are common to two of the three schemes, and how many are common (i.e. aligned) across all three schemes.

Figure 2 shows 36% of datapoints (by name) are exclusive to only one scheme, 58% are common to two schemes, and only 6% are common (i.e. aligned) across all three schemes. The sharing of datapoints by two schemes is dominated by the scheme-combinations of SFP-SFW and ASC-SFW but ASC-SFP has very little alignment.
An alignment graph for each of the 12 sections covered in the analysis is provided in Appendix 1. Key aspects for each section are described briefly below (in the basic order of the ASC principles). Again, it is important to emphasize that this “alignment” is by the name of the datapoint only, and other characteristics of each datapoint are analyzed in later sections.

**Regulatory Framework and Compliance**
Total 59 datapoints. 7% of datapoints are scheme-specific for ASC and SFP, but most datapoints (85%) are aligned between SFP-SFW (largely governance, area management and enforcement). 8% of datapoints (e.g. site licenses and legal compliance) are aligned across all three schemes.

**Code of Practice/Producer Organization**
Total 31 datapoints. No specific ASC content. All data points in this section are aligned between SFP and SFW.

**Habitat and EIA**
Total 32 datapoints. A third (34%) of datapoints are specific to one scheme, mostly (25%) from ASC (e.g. details of protected areas and salinization). Half the datapoints are aligned across ASC-SFW, but only 6% are aligned across all three schemes. As noted previously, specific requirements in scheme’s appendices, which include detailed ASC B-EIA requirements, have not been analyzed separately due to the likely lack of new datapoints.

**Shrimp Health – Disease**
Total 46 datapoints. 43% of datapoints are specific to one scheme (34% specific to SFW, e.g. relating to potential impacts to wild species, and 6.5% to ASC). Half the datapoints are shared by two schemes, with 41% aligned across SFP-SFW (e.g. biosecurity management, and outbreak data). Only 7% of datapoints are aligned across all three schemes (e.g. mortality rates, SPF/SPR).
Predators and Wildlife
Total 17 datapoints. No specific SFP content. Half (53%) of datapoints are specific to one scheme (24% ASC and 29% to SFW), with the other half (47%) aligned ASC-SFW.

Treatments - Chemical Use
Total 32 datapoints. No specific SFP content. Most datapoints (84%) are specific to one scheme (53% from SFW on details of antibiotic and pesticide use, and impacts, with 31% ASC specifics on probiotics). 15% of datapoints are aligned ASC-SFW on types and frequency of chemical use.

Species and Escapes
Total 58 datapoints. No specific SFP content. 34% of the datapoints are specific to either ASC or SFW (13% and 21% respectively), while the remaining 66% are aligned between ASC-SFW.

Source and Movements of Stock
Total 22 data points. No specific SFP content. 68% of datapoints are specific to one scheme, with 64% specific to SFW (mostly relating to movements and biosecurity). 32% of data points are aligned between ASC-SFW (e.g. sources of broodstock and postlarvae).

Feed
Total 51 datapoints. A third of data points are specific to one scheme (12% ASC, 4% SFP, 17% SFW), 43% of datapoints are aligned across two schemes, with a similar split between ASC-SFP, ASC-SFW, SFP-SFW. 24% of feed datapoints are aligned across all three schemes (e.g. sources of ingredients and their sustainability). The feed section therefore has the most alignment at the basic level of the datapoints.

Effluent
Total 56 datapoints. A quarter of effluent datapoints are specific to one scheme, with 20% specific to ASC (volume of water exchange, phosphorous and oxygen measurement), and 5% to SFW (e.g. protein contents). 70% of datapoints are aligned between two schemes, with 40% ASC-SFW (nutrient inputs and outputs and treatment) and 30% SFP-SFW (impacts to the waterbody and data availability). Only 5% of datapoints are aligned across all three schemes.

Energy and Wastes
Total 14 datapoints. SFW has one datapoint on energy data availability, but it has not been active in any SFW assessments, therefore all energy and farm waste datapoints are specific to ASC and there is no alignment across the schemes.

3.3 Scale Applicability of Data
Although the scale of each datapoint was categorized and recorded in the analysis, it has already been well-established that ASC standards focus at the farm site level, SFP at the province, and SFW primarily at the country level (specifically the “typical farm” at a country level). The analysis here confirms that these scheme-level characteristics drive the scale of the datapoints used with only minor variations, e.g. a few ASC datapoints apply at the pond level or to group certification, and SFW has done a few company-level and global-level assessments.

Figures 2 above showed there is some significant fundamental alignment of the datapoints by name across the schemes (at least across two schemes), but when the scale aspect is added and the
Datapoint-scale combinations are analyzed, most of that initial alignment is lost and there is virtually no alignment remaining across the schemes (Figures 3). That is, almost every datapoint-scale combination (e.g. antibiotic use at the site-level, or antibiotic use at the country level) is specific to only one scheme (93%). The minor exceptions are SFP-SFW datapoints relating to Codes of Good Practice at the industry scale, and ASC-SFW datapoints for a few escapes aspects at the waterbody scale.

3.4 Datapoint Importance

It is emphasized that the categorization of datapoints between “essential,” “important” and “minor” was not precise for SFP and SFW, but even as an approximate guide, it is useful to understand the flexibility and variability of the data used by each scheme, and particularly the ability of each scheme to conduct assessments in the absence of relevant data.

Figure 4 shows that the large majority of ASC datapoints are considered “essential” to every assessment; that is, an assessment can’t be completed without them (with the minimal exceptions for minor-non-compliances). Only a small number of ASC datapoints (primarily aligned with SFW) are considered minor for ASC and these relate to information on species characteristics and escape impact risks where (in the case of a non-indigenous farmed species) the ASC audit manual requires the auditor to “Review, as a minimum, evidence of no negative impact and assess its accuracy and appropriateness by means such as an internet review, including, as a minimum, a Google search.”

Very few datapoints are considered to be “essential” for a SFP or SFW assessment; indeed these scheme’s standards specifically recognize a lack of data, are able to complete assessments in the absence of specific data, and score such limitations accordingly. SFP and SFW have the most “minor” datapoints and while this must be interpreted cautiously, it is another indicator of these scheme’s
flexibility in using a variety of datapoints that may not be specified in their aquaculture standard or scoring methodology.

![Diagram: Importance of active data points](image)

**Figure 4:** Percentage of each scheme’s datapoints categorized by their importance (essential, important, minor).

### 3.5 Timeframes

The analysis of the data timeframes used by each scheme shows a clear contrast between them. Although there are some cases where ASC uses a shorter timeframe of data from 6 months or just one production cycle (e.g. for first audits), the scheme has a default requirement for data covering the prior 12 months up to the assessment (audit) date. ASC therefore both desires and uses data from this most-recent 12-month period.

In contrast, while SFW and SFP would also like to take a “snapshot” of current production by using the most-recent data, they often do not have access to the previous 12 month’s data due to the common lag in data reporting and publishing (e.g. by industries, governments or academic publications). As a result, SFP and SFW often use variable timeframes of 1-5 years or more (i.e. whatever is the most recent available) and may occasionally use academic references that are up to 10 or more years old for specific reference values. The “snapshot” aspect therefore relates more directly to available data rather than truly to the current production characteristics.

It is important to note that SFP and SFW also deliberately choose to use data over longer timeframes and to refer to older academic references in order to understand trends or shifts in the industry, annual variability in data, and to compare the current situation to those in the past (e.g. data coming from pre-aquaculture periods that helps understand aquaculture’s current impacts). Figure 5 is an approximate graphical interpretation of this situation, showing the contrast between the data timeframe desired and that commonly used by each scheme.
It is also relevant to note that with regard to data timeframes, an ASC audit is set well in advance, and the farm gathers the data from the 12 months leading up to the audit date. The audit is then completed in a matter of days. In contrast, SFP and SFW assessments occur on a loosely specified timeframe and take extended periods to complete (up to a year or more in some cases). In these circumstances, datasets may be updated several times as new data, papers or reports etc. are published. Therefore, with regard to potentially sharing data across the schemes, the most important data aspect for SFP and SFW is identifying the relevant source of data (from which data can be gathered to meet the relevant assessment timeline).

Given the update frequency of assessments from each scheme (ASC 1-year surveillance audits, SFP 2-years and SFW 3+ years), there is a further extension of data timeframes for each scheme with ASC surveillance audits maintaining ASC data at a 12-month timeframe, whereas a live SFW report written using (for example) 1-2-year old data and prior to update at 3-years old has key data aged to four-five or more years.

Also considering the ongoing updates of assessments in each scheme, the accumulation of reports over time represents a potentially important track of changes on individual farms, trends in industries, and in the data available from them. Currently, this information is not compiled in any readily available format (and in the case of the annual certification reports of many ASC farms, would be particularly unwieldy for manual data extraction), but could be a useful resource if made available in a database. The ASC M&E framework recognizes this potential, stating: “The criteria and indicators in the standards serve as both compliance and M&E data points, tracking on-farm results.”

### 3.6 Data Sources

While emphasizing again that the determination of all potential sources for each datapoint was not precise, Figure 6 shows a robust (and largely expected) pattern of sources across the schemes. That is, the datapoints used in ASC audits come primarily from the farm under assessment (or the company or unit of certification etc.), and secondarily from topic-specific sources such as the feed mill. In contrast,
SFP and SFW use a wide variety of data sources from the broader industry, government, academic literature, research reports, feed mills, personal communication and grey literature. Interestingly, both SFP and SFW also use other certification schemes (primarily the audit reports of ASC and the number of ASC/GAA-certified farms in a province) as data sources.

![Data Sources](image)

*Figure 6: Data sources used by each scheme. Fa = Farm, In = Industry, G = Government, AL = Academic Literature, RR = Research Reports, Ce = Certifier, FM = Feed Mill, PC = Personal Communication, GL = Grey Literature.*

### 3.7 Direct-Active-Passive Data Collection Methods

With the aim of identifying data sources that receive direct and potentially multiple requests for data as a result of ASC, SFP or SFW assessments, the approximate proportions of data points obtained by “direct”, “active” or “passive” methods (as defined in Table 4) were analyzed. It is important to note that different methods may be used for the same datapoint in different assessments; for example, a datapoint may be publicly in one assessment, but require a direct contact in another, therefore these results should be used as an approximate guide only.

Figure 7 shows that ASC is dominated by “direct” requests for data (primarily to the farming company or unit of certification). In contrast, SFP uses almost entirely “active” data collection from publicly available sources. SFW typically makes a “direct” request to producers, industry bodies, feed mills or governments for many different datapoints, but receives highly variable amounts of useable data in response. Therefore, they also make “active” data searches for most or all of the same information. A minor number of datapoints are categorized in Figure 7 as “passive”, with most being allocated to SFW; these are typically minor datapoints that might be used given the flexibility of the SFW standard to utilize different types of data. SFW also commonly requests expert opinions (i.e. personal communications), and these are included here as “direct” methods, even though the responses are again highly variable.
In general, while ASC is dominated by “direct” data gathering from the farming company, SFP and SFW obtain most, and often nearly all, of their datapoints from “active” research rather than “direct” requests. By comparing the sources of the “direct” datapoints in ASC (farm, feed mill, hatchery) and SFW (producer organizations, governments, industry experts), the only source of data routinely receiving potentially overlapping direct data requests are feed mills. Therefore, two options for greater alignment identified here are at the feed mill, and potential time savings when SFP and SFW search the same sources for similar data.

It is also relevant to note here that in addition to the data collection described above, schemes may be subject to data “delivery” from active stakeholders. For example, SFW receives data from members of the Conservation Alliance who work on aspects of the industries being assessed by SFW. These data may be helpful in providing data that may not otherwise be readily available but may be subject to bias in terms of the impact coverage or interpretation.

3.8 Public Availability of Data
SFP and SFW both use each other’s and ASC’s assessment reports as data sources and also to identify data sources that they are unfamiliar with (and could subsequently use in their own reports). As such, there is double aspect of public data availability in both the data sources used as inputs into an assessment, and of the data outputs that are published in the subsequent assessment report/profile (which may then become sources!).

An attempt at an estimate has not been made, but the site-specific data used in ASC assessments are (with some exceptions) not typically publicly available. While often heavily aggregated, a lot of data obtained at the site-level in ASC audits are now presented in ASC audit reports. Many specific values are directly useful as reference points to SFW and to a lesser extent SFP. ASC is not considered to use any data from SFP or SFW reports (see the Discussion on the potential for this to change).
SFP in contrast, only uses or refers to publicly available data (defined as: “information or data that is directly available for consultation in the public domain or through requests”). That is, information sources and data on governance measures and outcomes can only contribute to Fishsource scores if the data can be obtained by any other organization or individual. SFP Fishsource profiles publish some of the data obtained from these sources, but in general, their alignment with the data needs of the other two schemes is limited to SFW who use them to identify (potentially obscure) sources of data rather than the data themselves.

Similarly, SFW assessments primarily only use data that are publicly available, but go one step beyond SFP by using data that a SFW analyst has gained privately (e.g. by direct data requests) that the source will allow to be published (potentially in an aggregated form) in a SFW report. As such, the latter is not applicable as a source for SFP (because the data source could not be obtained by any member of the public). SFW reports still have some alignment value with SFP in identifying (publicly available and again, potentially obscure) data sources.

3.9 Data Complexity
While not specifically analyzed, it is of interest to note that ASC datapoints are designed (during the dialogues and maintained in subsequent standards revisions) to be sufficiently straightforward and economical to gather that they do not deter a farm from applying for or achieving certification. Similarly, they must be auditable in a cost-efficient manner. In contrast, many datapoints for both SFW and SFW (even if they may appear straightforward “on paper”) are complex and challenging to gather and analyze (e.g. understanding enforcement aspects of governance or impacts of escaped shrimp in the wild), and these assessments (particularly SFW) can take extended periods to research and complete.

3.10 Monitoring and Evaluation
ASC’s Monitoring and Evaluation framework has a total of 94 metrics associated with 31 indicators in 13 categories of intended change over varying timeframes. Of these, 19 are directly relevant metrics for SFW assessments, and 10 for SFP. They are primarily clustered in: “Reach/Basic Stats”, “Minimised negative effect of aquaculture on Environment”, and “Increased efficiency through reduced production costs.” The latter two sections are under the “Longer-term outcomes” phase. Specific metrics/datapoints are provided in the accompanying Excel workbook.

This simple analysis identifies clear overlaps in some datapoints, particularly many key environmental datapoints, which could be tracked in an aligned way between the schemes. Further analysis will be possible with the M&E framework from SFW when it is available (an equivalent from SFP is not currently anticipated).
4. Discussion

4.1 Data Mapping
The data mapping and analysis was comprehensive, and (despite the minor limitations and sources of error in the definitive accuracy of every datapoint and its characteristics) it delivered a strong understanding of each scheme’s data profile and the nature of the alignment across all three.

Despite covering a similar range of impacts, there is perhaps surprisingly little alignment of the 418 datapoints identified. Only 6% of datapoints are shared/aligned across all three schemes (Figures 2), and while 58% are shared/aligned between two schemes, when additional datapoint characteristics are also considered (such as applicable scales, timeframes or sources) the alignment across even two schemes largely disappears and >90% of datapoints become specific to only one scheme (Figures 3).

When each content section of the standards is analyzed separately, the patterns are similar in nature, but variable in scale. Even the sections with most alignment (Feed and Effluent) have only 24% and 5% of alignment respectively across all three schemes, but 43% and 70% alignment across two schemes. Again, when characteristics such as scale, timeframe or source are added, the alignment across even two schemes quickly disappears.

In reality, despite some superficial similarity in impacts covered, the lack of data alignment is driven by the scheme fundamentals, i.e., the ASC focus at the farm-level, SFW at the industry/country level and SFP on provincial governance. In summary, the analysis of datapoints and their characteristics show:

- **ASC**: The datapoints used in an ASC assessment (i.e. audit) are specific and precise. They cover a primarily fixed 12-month timeframe and have a minimal number of sources of which the farm is dominant. Almost all datapoints are essential (i.e. the assessment can't be completed without them), relate almost exclusively to the site level, and are intended to be straightforward to gather by the farm. The data gathered is typically not publicly available, but increasingly available in audit reports. With the second-highest number of datapoints all applied at the site-level, collectively they represent a detailed picture of farm-level practices and impacts (or a group of similarly managed farms). The basic ASC datapoints have some alignment with SFW (26% of all datapoints), but not with SFP (2%).

- **SFP**: The datapoints used in a SFP profile are less precisely defined than ASC but more flexible, and are distinguished by the focus on governance. While some governance aspects are overarching, SFP (intentionally) covers less of the specific impacts addressed here and has the lowest number of specific datapoints of the three schemes. Many of the SFP datapoints relating to governance are simply defined, yet complex to gather and assess. All the data referred to by SFP must be publicly available. Collectively, they build a picture of governance content and effectiveness at the provincial scale. Like SFW, many different data sources are used, and an assessment can be made in the absence of data. SFP has some alignment with SFW (30% of all datapoints) but not ASC (2%).

- **SFW**: The datapoints used in a SFW assessment are also less precisely defined than ASC but more flexible. In contrast to ASC, an assessment can be made in the absence of data, and an absence is a defined scoring characteristic in the standard. The timeframe of the data used is variable and while longer timeframes are used to indicate trends, the most-recent 12 months data timeframe used by ASC is often not available. SFW has the highest number of environmental datapoints, and many are complex to gather and assess. The data used is typically publicly available, or permitted to be published in a SFW report. SFW uses a wide
variety of data sources, and the datapoints collectively represent a bigger picture at the industry/country level. The basic SFW datapoints have some alignment with both ASC (26% of all datapoints) and SFP (30%).

4.2 Data Quality
SFW and SFP assesses various characteristics of the data available for an assessment (e.g. third-party verification, timeframe, geographic scope, source and data collection methods) to give an indication of data “quality”. In this regard, data obtained during an ASC audit would be considered good quality (i.e. it is collected by a third-party auditor, is specific, and has a short timeframe). Yet both SFW and ASC were affected by the data fraud of Nova Austral in Chile such that the quality of the data used by all three schemes must be considered to be inherently vulnerable. No further analysis is conducted here, but this aspect is emphasized for further consideration.

4.3 Potential for Alignment
The limited basic alignment of datapoints is considered to be due to the fundamental differences in each scheme’s modus operandi. It is well established that ASC focuses on responsible farm-level practices, SFW focuses on impacts at the industry/country scale, and SFP focuses on governance at the provincial scale. But it is also well established that the three schemes are fundamentally aligned in terms of their goals of improving the environmental performance of aquaculture, and in the simple fact that they all “assess, monitor and evaluate aquaculture production and use various sources of public and private data” (quote from the RfP). Therefore, with a “glass half full” perspective, the limited alignment across the schemes apparently represents a great opportunity to improve data alignment, coordination and sharing.

For example:
- Where the data collected are the same, there is potential to streamline collection, to fill gaps, and to benefit from scheme-specific relationships with data providers or sources.
- Where the data collected are different, there is the potential to build a more robust understanding of production practices and impacts.
- Where the data collected apply at different scales, there is the potential to build a more robust understanding of farm-level and industry contributions to cumulative impacts.
- Where the data collected have different sources, there is the potential to crosscheck, consider different perspectives and reduce scheme risks from using corrupt data.
- Where the data collected have different timeframes there is the potential to better understand trends, annual or cyclic variability, and the representativeness or robustness of the most recent datasets.

Similarly, the previously stated scheme foci (on farm-level practices, industry/country-level impacts, and governance at the provincial scale) inherently lend themselves to alignment in building a more robust “big picture” of aquaculture sustainability. Indeed, the SFP Aquaculture methodology, created some years after ASC and SFW were established, was designed to add the governance umbrella to the site- and industry-level coverage of the existing certification and ratings schemes.

4.4 Potential Scheme-to-Scheme Coordination
The following are a list of rough ideas grouped into those relating to improving efficiency and those relating to scalability. Although not discussed specifically, many of these aspects can be pursued
discreetly between the three schemes or could be pursued in a more open forum with input from other organizations. As such, rudimentary scheme-scheme data sharing processes may be viable, or a data or information hosting platform may be useful. Specific examples are mentioned below, but more general examples such as the Sustainability Impacts Learning Platform (ISEAL, Sustainable Food Lab, WWF) may be a viable tool (https://sustainabilityimpactslearningplatform.org/).

4.4.1 Improving Efficiency
Improved efficiency can lead to reduced assessment times, acquisition of better (more complete, robust, up to date etc.) data, a reduction in direct requests to data providers, easier scoring decisions, and more accurate outputs.

Feed Data Alignment
The greatest alignment of datapoints across the three schemes occurs in the feed section. Here, 24% of datapoints are aligned across three schemes, 43% are aligned across two schemes (split evenly between the ASC-SFP, ASC-SFW, SFP-SFW scheme combinations) and 33% are specific to only one scheme. This is also an area where direct contacts are made by both ASC farms and SFW analysts to what is often a small number of relevant feed companies. While SFP typically does not make direct contacts, they are seeking somewhat similar datapoints and overall, there is a large potential for data sharing. It is also relevant to note the SFP Ocean Disclosure Project (ODP) which provides some data of relevance to ASC, SFP and SFW aquaculture assessments (currently four global feed companies are members and disclose sources of marine feed ingredients and their sustainability).

As the topics of feed composition, sustainable sourcing, and efficiency of use are such complex yet important aspects of sustainable aquaculture, the potential appears great for the development of tools to increase data accessibility. While this could be achieved discreetly between the three schemes assessed here, there is the potential to include additional organizations such as the Global Aquaculture Alliance (GAA), the International Fishmeal and Fish Oil Organisation (IFFO), or other relevant stakeholders. Similarly, while data sharing and transparency could be achieved discreetly through the three schemes with a simplistic or bespoke system, the potential exists for a much greater scale of transparency with a resource equivalent to (or in addition to) the ODP, or (for example) by adding a module to an existing database such as the International Aquaculture Feed Formulation Database (IAFFD) which is an open access database for the aquaculture industry.

- Requires input from: All schemes and external stakeholders (i.e. feed companies)
- Benefits: All schemes and potentially other stakeholders.
- Risks: need to focus (at least initially) on aggregated data that is readily acceptable to share publicly by feed companies to facilitate their involvement.

ASC Data Availability
SFP and SFW currently use data from ASC audit reports to varying degrees, but with increasing numbers of certified farms, analysis is time consuming. A basic ASC “database” of the public information presented in ASC audit reports would be a useful resource. Given standardized audit templates and an ASC organization-wide database (expected to be active mid 2020), the development cost would be minimal moving forwards, but the effort to upload all old ASC audit reports (initiated by ASC for key species) is challenging. While the term “database” is used, at the simplest level this could be an Excel file available on request from ASC specific to an agreement with SFW/SFP or made publicly available. Ideally it would be part of ASC’s website reporting.

- Requires input from: ASC to establish. Minimal maintenance if automated.
• Benefits: SFP, SFW, other stakeholders.
• Risks: none – reformatting data already published in audit reports.

Utilizing ASC Farmer Knowledge
Unlike ASC, SFP and SFW typically have little direct engagement with farmers, yet farmers are excellent sources of local, waterbody or regional data sources and monitoring reports, and information on production practices, novel techniques or industry trends. These resources may well be missed by SFP or SFW assessors, particularly when in non-English languages. ASC could add simple questions to the audit to elaborate on typical production practices at the local/waterbody/regional scale, particularly on non-certified verses certified farms (on the assumption that certified farms may be considered the exception in a region and SFP and SFW are reluctant to extrapolate their practices to the broader area).

• Requires input from: ASC to establish, SFP and SFW to elaborate.
• Benefits: ASC, SFP, SFW all gain a better understanding of the broader production characteristics and the differences between certified and non-certified farms.
• Risks: Additional audit interview time for questions not relating directly to the ASC standard compliance.

Shared Data Sources
SFP and SFW use some specific datapoints from each other’s assessments but primarily use them to identify the data sources from which the most recent dataset could be obtained. SFW reports are lengthy and mentions of data sources may be spread throughout the text, whereas SFP may have several provincial profiles within the scope of a single country assessed by SFW. Although both SFP reports and SFW reports have data sections, these could be formatted more clearly to list relevant data sources. An independent country data profile could potentially be maintained (potentially even a “Wiki” format) but referencing just the data sources. Beyond the schemes, this could be a useful “service provider” for a wide range of stakeholders. It could also be extended to reference lists of key papers, research reports and grey literature. Various aspects of this have already been discussed by the schemes.

• Requires input from: SFP, SFW to establish and maintain
• Benefits: SFP, SFW.
• Risks: Requires input from both schemes to be “fair”.

Practical Governance Database
While useful sources of regulatory information are available (i.e. FAOLEX) the content is typically voluminous, complex, and often difficult to interpret in a practical context (i.e. how the “dry” regulations are implemented in every-day aquaculture). This information is useful to ASC for CAB and farm-level preparation for audit, and to SFP and SFW as important parts of their assessments, yet is time consuming to collate and review. A collaborative resource reviewing important aquaculture countries or provinces could be envisaged. Ongoing SFW on Aquaculture Governance Indicators could contribute to this and develop as a host.

• Requires input from: ASC, SFP, SFW to establish and maintain
• Benefits: ASC, SFP, SFW.
• Risks: Complexity and workload to maintain.

Key Documents Repository
During assessments, SFP and SFW review large amounts of academic literature, research reports and grey literature. Key papers are also of use to ASC standards teams etc. Extending from the “Data
Sources” option above and given the transient nature of online material and hyperlinks, a shared document library is feasible.

- Requires input from: ASC, SFP, SFW to establish and maintain
- Benefits: ASC, SFP, SFW.
- Risks: Quickly runs into copyright issues, and the amount of literature may be prohibitive to maintain in a useable format.

4.4.2 Improving Scalability

In addition to the potential for improving efficiency in data collection, the different types of data (i.e. applicable to different scales, timeframes or other characteristics) used by each scheme give the potential to enhance the nature of each scheme’s assessment.

**SFP and SFW Scores as ASC risk Identifiers.**

As SFP and SFP operate at a larger scale than ASC (i.e. province or country), their assessments provide the potential to identify high-level issues in the regions in which farms are certified or intend to become certified. As the ASC B-EIA now functions somewhat as a risk assessment for farms and the ASC, impacts highlighted by SFP and SFW with low and/or “Red”/“Critical” scores can be used as a risk assessment to ensure appropriate scrutiny of B-EIA process and results, and of the farm’s subsequent performance.

Similarly, the SFP focus on governance and the developing “Aquaculture Governance Indicator” project from SFW/Wageningen have the potential to flag weaknesses in the governance systems of countries in which ASC-certified farms operate or are applying to operate. Again, these provide the potential to act as risk assessments for ASC to ensure appropriate management, and potentially to raise the profile of the ASC by demonstrably bridging the holes or weaknesses in a country’s aquaculture governance.

- Requires input from: None – utilizing existing data
- Benefits: ASC
- Risks: The scale of SFP and SFW data are too large and are not directly applicable to “waterbody” scale impacts of most relevance to ASC.

**ASC Using Larger Scale Data**

While ASC standards are intended to minimize site-level impacts to the extent that they do not contribute substantially to any local cumulative impacts, ASC is still open to criticism in the situation that a small number of certified farms are operating within a larger non-certified industry. Provincial or country-level data from SFP and SFW can be used to give confidence that the industry-scale impacts are understood and therefore that the ASC-certified farms (in combination with the non-certified industry) are not having a cumulative impact, or that the ASC-certified farms play a minor role in the case that cumulative impacts are present.

The potential relates primarily to five impact categories where single ASC farms are vulnerable to criticism for their potential role in cumulative impacts, and therefore where evidence of the scale of cumulative impacts (or particularly a lack thereof) can be utilized by ASC to support their farm-level management.

- Effluent – SFP and SFW gather data on cumulative effluent impacts, the governance systems in place, and their enforcement/effectiveness. These data can be used to support the farm-level management of effluent on ASC-certified farms.
- Habitat – SFW gathers data on the functionality of ecosystem services in broader habitats utilized by aquaculture. These data can be used to assess the role ASC-certified farms play in
habitat impacts or protection and to support the farm-level management of escapes on ASC-certified farms. Conversely, ASC data on buffers, borders and corridors can be directly used by SFW in their assessment of habitat impacts.

- Escapes – SFW gathers available data on the impact of escaping non-native species or of genetically distinct native species. These often-complex data can be used to embellish the simpler/stricter ASC requirements, and to support the farm-level management of escapes on ASC-certified farms.
- Disease – SFP and SFW gather data on cumulative impacts of pathogens and parasites to other producers (SFP) and wild species (SFW). These data can be used by ASC to support the farm-level management of effluent on ASC-certified farms.
- Wildlife – SFW gathers data on the status of wildlife populations impacted by aquaculture. These data can also be used to support the farm-level management of wildlife management on ASC-certified farms.

- Requires input from: None – utilizes existing assessment data
- Benefits: ASC
- Risks: As above, the scale of SFP and SFW data are too large and are not directly applicable to “waterbody” scale impacts of most relevance to ASC.

The Use of Data from Multiple ASC-certified Farms in SFP/SFW Area-based Assessments
Evidence of ASC-certified farms (and the data in their audit reports) is directly useful for provincial or regional assessments by SFP and SFW, but other opportunities come into play as the number of certified farms in an area increases. For example, multiple ASC-certified farms in an area (i.e. waterbody, province, country) can increase SFP/SFW confidence that the area is managed collectively with a corresponding reduction of impact concern with increasing numbers of “responsibly operating” certified farms. SFP and SFW would benefit from increased understanding of the connectivity of ASC farms in terms of their coordinated management and/or influence of the surrounding industry.

- Requires input from: SFP/SFW (or potentially ASC) to compile area/region-specific data
- Benefits: SFP and SFW
- Risks: An impractically high number or proportion of ASC-certified sites may be required to give sufficient confidence to SFP/SFW that ASC farm practices represent the industry as a whole.

Farm-level Verses “Typical farm” Assessments.
SFW assessments, and to a lesser extent SFP, are assessed based on the production characteristics of a “typical farm” in the area being assessed (i.e. waterbody, province, country). This gives ASC an opportunity to compare the performance of ASC-certified farm to these approximations of the region’s “typical” production. For example, SFW assessments identify typical antibiotic use, and ASC can analyze their audit data to see if ASC farms improve upon it.

Similarly, if there are a lot of ASC farms in the scope of a SFP or SFW assessment, then this can be used to increase the apparent performance of the “typical farm” (particularly in the case that regional data are not available – for example if antibiotic data is not available, the recorded use on ASC farms can be used as at least an approximate datapoint despite the concern that it may reflect “better-than-average performance). As noted in the data analysis presented in previous sections of this report, there is already some alignment of datapoints between ASC and SFW (less between ASC and SFP), but an additional exercise could be conducted to identify optimal datapoints that could be added to either scheme’s assessments to facilitate this aspect.
• Requires input from: Potentially from all schemes to identify datapoints of relevance for “typical farms”
• Benefits: All schemes
• Risks: As above, an impractically high number or proportion of ASC-certified sites may be required to give sufficient confidence to SFP/SFW that ASC farm practices represent the “typical farm”.

Greater Utilization of SFP’s Governance Profile
The governance datapoints of SFP are directly relevant to some SFW datapoints and have the potential to be used to a greater degree by ASC, particularly given the provincial scale granularity of SFP assessments (e.g. currently nine key provinces in Indonesia). A greater understanding of the underlying regulatory system and any additional layers of industry management is beneficial to ASC in terms of identifying above-average performance in certified farms and regulatory compliance requirements, and to SFW in particular if their risk assessments are used.
• Requires input from: none, utilizes existing assessment data
• Benefits: ASC, SFW
• Risks: None

Performance Trends and Variability
SFP and SFW assessments collect a wide range of data from different sources, often using much longer timeframes of data than ASC and multi-farm datasets. Various background datapoints may be useful to ASC to help put farm-level practices into context in terms of understanding long term trends and spatial or temporal variability. E.g. a description of long-term trends and variability in pesticide use can be used to better understand pesticide use across ASC-certified sites in a region.
• Requires input from: All to identify relevant datapoints.
• Benefits: Potentially all
• Risks: None

Additional Impacts and Reputational Risk
SFW/SFP assessments could flag awareness of other impacts not covered by ASC for which the certified farms and scheme could criticized – e.g., use or movement of cleaner fish (in salmon farms), disposal of excess shrimp postlarvae in natural waterbodies, presence of escaped shrimp in the wild and changes in the genetic profiles of wild shrimp as a result and so on.
• Requires input from: All to discuss relevant aspects
• Benefits: ASC, plus potentially SFP/SFW if a three-way discussion.
• Risks: None

Additional Scheme Projects, Information and Expertise
Additional workstreams (i.e. beyond direct audits/assessments) have the potential to greatly inform and influence other schemes; for example, the Independent Verification Platform (IVP), Partnership Assurance Models (PAM), and Aquaculture Governance Indicator (AGI) projects currently at an early stages of development by SFW, the ASC technical committees on feed or other key topics, SFP projects such as the Ocean Disclosure Project. Other initiatives from other NGOs or are also likely to be of relevance.
• Requires input from: All to discuss
• Benefits: Potentially all
• Risks: Organizational intellectual property
4.5 Coordination in Practice – Can It Be Done?
The three schemes assessed here have had extensive communications about scheme-scheme alignment over a period of a decade or more in various formal and informal arenas. As noted above, the schemes have well-established differences in their modus operandi, and tend to have over-stretched staff that naturally resist new initiatives unless there is a clear consensus on a “burning desire” to pursue an achievable mutually beneficial outcome. The Certifications and Ratings Collaboration and the ISEAL innovations project are two examples that are driving ongoing communications between the three schemes, and the work presented here clearly outlines the potential for mutually beneficial outcomes if the desire is there.

5. Conclusions
The data mapping exercise conducted here has shown some basic similarities and alignment in the datapoints used by the three schemes but has also clearly shown that when additional characteristics such as scale and timeframe are considered, there is minimal specific data alignment between them. This is largely considered to be due to the fundamental differences in each scheme’s modus operandi (i.e. the ASC focuses on responsible farm-level practices, SFW focus on impacts at the industry/country scale, and SFP focuses on governance at the provincial scale). These fundamental differences illustrate a huge potential for data sharing in the context of increasing efficiency and scalability, and by building robustness in each scheme by incorporating additional aspects from each other’s scope. While some simple examples have been described here, it is important to remember that the modus operandi are discreet somewhat by design, and there must be a “burning desire” for a substantial mutually beneficial outcome if progress is to be made. Although not directly assessed here, there is additional potential for data collaboration in the additional workstreams underway in each scheme.
Appendix 1 – Section-Specific Alignment of Basic Datapoints

Sections with only one scheme content present are not included here due to an inherent lack of alignment (i.e. Energy and Wastes for which all content is for ASC).

**Figure 8: Regulations**

**Figure 9: Code of Good Practice and Producer Organization**
**Figure 10: Habitat and Environmental Impact Assessment**

**Figure 11: Shrimp health - Disease**
Figure 12: Wildlife and Predator interactions

Figure 13: Species characteristics and escape
Figure 14: Broodstock and source of stock

Figure 15: Feed
Figure 16: Effluent

Figure 17: Treatments, chemical use.