



**Limitations and Caveats of Alberta's Fish
Sustainability Index (FSI)**

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Why the FSI was Developed

Province-wide fisheries management strategies must rely on the basic building block of assessments of the status of individual stocks of fish. These strategies and assessments are components of the most fundamental management task of determining the effect of human disturbance on a fish population, and quantifying the effectiveness of recovery and maintenance actions. However, for fisheries management strategies and plans to be consistent across Alberta, fish stock assessments must be comparable between stocks, areas and time. To achieve this objective, a standardized process of assessment, called the Fish Sustainability Index (FSI) has been developed.

The FSI assessments characterize the status and level of risk of individual fish species⁴ across the province by combining scientific and local knowledge into 17 different metrics. Metrics are grouped into three broad categories: population integrity, population productivity, and the threats resulting from harvest and habitat loss and their mitigation.

Why the FSI is Useful

When completed, provincial FSI assessments paint a picture of the current status of a fish species and the related health of the watersheds they reside in. The results from a FSI assessment can be used to direct and prioritize numerous future fisheries management and conservation actions. For instance, findings can be used to:

- Provide a landscape-level, provincial overview of fish sustainability
- Allow for broad temporal comparisons in changes in sustainability
- Support broad-level comparisons between fish sustainability and management actions (e.g., regulations, species management plans, land use planning)
- Provide information to assist in planning priorities for land use and resource management at provincial scales
- Inform public policy and educate decision-makers on the impacts anthropogenic activities on fish populations
- Develop watershed restoration strategies
- Inform and guide conservation work of partnership agencies, and educate the general public.

FSI Limitations and Caveats

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While the FSI is an innovative tool developed to support Alberta fisheries management, users must also understand the limitations to the data presented in assessments. Specifically,

- For each of the 17 metrics in the FSI, the reliability of the data used to rank that metric was also evaluated. Data quality, quantity and timeliness are assessed to convey how likely the assessment is erroneous due to incorrect, inaccurate, or lacking data. When interpreting FSI results, data reliability scores and their comments should be consulted.
- Fish capture and life history data used in a FSI is extracted from the Fish and Wildlife Management Information System (FWMIS) database. Data present in FWMIS represents fisheries data returns from sources such as government, conservation agencies and environmental consultants. Limitations of the FWMIS data could include:
 1. The accuracy of a FSI assessment is dependent on the integrity of the data being submitted into FWMIS. Inaccurate or erroneous data could lead to misleading FSI results.
 2. Although useful, most of the data found in FWMIS was collected as part of small-scale projects using a variety of methods, at different times of the year and using varying degrees of effort. This can make data standardization difficult.
 3. Species that are more heavily studied e.g. actively managed sport fish species or those that are naturally more abundant will generally have more information available in FWMIS. Increased information can simplify the FSI assessment. Alternatively, those species that are patchy, difficult to catch or are in low abundance are often underrepresented in FWMIS. For instance, lentic walleye have been consistently monitored for over a decade using the standardized FWIN (fall walleye index netting) protocol. As a result, we have excellent population estimates for studied lakes. Conversely, goldeye and mooneye are often patchy in mainstem rivers and captured during non-standardized fisheries sampling. For these species, population status is far more difficult to assess.
- FSI ranks are relatively straightforward to assign and biologists conducting FSI assessments strive to be as quantitative as possible. However, when there is a lack of information, metrics were often ranked qualitatively and should therefore be considered largely subjective.
- A FSI is a large-scale summary of fish species' status and risk and as such is meant to support broad-scale provincial comparisons it is not representative of fine-scale processes and management.
- Caution should be exercised when applying the results for FSI metrics where there is sparse data and uncertainty is high. For instance, historic adult density in a watershed may be ranked from a handful of historic angler surveys, and journals

Limitations and Caveats of Alberta's Fish Sustainability Index (FSI)

found in warden cabins. Although this may be the best information available, data reliability scores and comments should be consulted to provide appropriate context.

- Perspective can often be provided for a single FSI metric by consulting other metrics. For example, the current adult density in a watershed may be low (2) for a focal species but when consulting historic adult density and natural limitations, it's found that the habitat was marginal and historic populations were also low (1). Therefore, there has been a relatively small shift from the historic condition.

Summary

When FSI information is used in the appropriate context, and its limitations understood, it can be a powerful broad-scale summary and management tool for Alberta's fisheries. For more information about the Fish Sustainability Index and guidance about how FSI information can be interpreted and used, please contact Laura MacPherson, Provincial Stock Assessment Biologist at laura.macpherson@gov.ab.ca or Dave Park, Fish Allocation and Use Specialist at dave.park@gov.ab.ca.