ISC scoring

Index of Stream Condition (ISC3)

The Index of Stream Condition (ISC) brings together data from a wide variety of sources to give a detailed overview picture of river condition across Victoria.

The ISC is an integrated measure of river condition and has five components or **sub-indices:**

1. Hydrology
2. Physical Form
3. Streamside Zone
4. Water Quality
5. Aquatic Life

A number of **indicators** are combined to characterise each ISC sub-index. A total of 23 indicators are used and each of these is considered important in characterising river condition from a state wide perspective. The ISC is evaluated for sections of river known as a 'reach'. ISC reaches are typically between 10 and 30 km in length and have a similar flow regime, vegetation and landscape characteristics. For the 2010 ISC assessment 1,181 reaches were assessed.

ISC scoring

Each ISC sub-index is given a score out of 10 based on the assessment of a number of indicators. For information about the indicators for each sub-index please refer to the relevant ISC sub-index Fact Sheet. The overall ISC score combines the scores for the five sub-indices to create a total score between zero and fifty for each reach; the higher scores indicating better river condition.

While the five sub-index scores are combined to produce a score out of fifty, they are not simply added together. A transformation known as an inverse ranking is applied. The inverse ranking transformation (see Table 1) recognises that a particularly low score for one sub-index will have a limiting effect on river condition, even if the other sub-indices score highly. In these cases, the inverse ranking transformation results in a lowered ISC score.

- To calculate the inverse ranking score, all five sub-indices must have a score. For a number of reaches this is not possible as they do not have a water quality and /or aquatic life score (only 30% of reaches have a water quality score and 70 % of reaches have an aquatic life score).
- Where one or more sub-indices do not have a score, these need to be estimated and are based on the average of the existing sub-index scores.
- If a reach has less than three sub-indices with a score, then it is not possible to calculate the overall ISC score.

Table 1. Applying the inverse ranking transformation

Sub-index score	Multiply by	New score
6	5	30
7	4	28
8	3	24
8	2	16
10	1	10
	Total *(score out of 150)*	108
	Divide by 3 *(score out of 50)*	36

Department of Environment and Primary Industries
State Government Victoria

ISC scoring

To calculate the ISC score using the inverse ranking transformation:

Place the five sub-index scores in ascending order. Multiply the lowest score by 5, the next lowest score by 4 … and the highest score by 1. Then add the totals together to produce a score out of 150. The final step is to divide this score by 3 to produce a final ISC score out of 50. If necessary, this score should be rounded off to the nearest whole number.

Condition classes

Once the inverse ranking transformation has been applied and a score out of 50 calculated, the condition class can be assigned (see Table 2). The condition class is the overall condition of the reach. It should be noted that the condition class is useful for an overview of reach condition, but the sub-index scores and individual indicator scores hold the major information.

Table 2. ISC condition classes

Overall ISC score	ISC Condition class
41 - 50	Excellent
35 - 40	Good
24 - 34	Moderate
20 - 23	Poor
0 - 19	Very Poor

Reference condition

The majority of river condition assessment techniques adopt what is termed a 'referential approach'. The ISC is no different. All indicators are scored relative to a reference condition. This involves comparing the current river condition against its reference condition. The reference condition is generally accepted to be what the river would have looked like in its undisturbed or unmodified form (i.e. before European settlement). The reference condition is used as a convenient point of comparison for the current river condition.

The change over time represents the environmental condition of the river, for example, if a river is close to its reference condition it is assumed to be in good environmental condition (as it has changed little), while a river that is very different to its reference condition is assumed to be in poor environmental condition. Essentially the use of a reference condition is a standardisation method to allow sensible comparisons across Victoria, allowing the condition of a river reach to be compared with any other reach.

The reference condition of a river or river reach can be determined through a variety of sources, including collecting data from minimally disturbed sites, using historical data, computer modelling or using expert opinion. The aim of using a reference condition is to allow comparison of the environmental condition of river reaches, even if they have very different characteristics.

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