# Summary: Habitat Loss and System Capacity

# Stressor:Habitat loss (%)

# Response:System Capacity (%)

# Species:Plains Sucker (*Pantosteus jordani*)

# Life Stage:adult

# System:Saskatchewan

# Function Derivation:expert judgement

Transferability of Function:Thisstressor-response function is suitable for use on Plains Sucker populations in the Saskatchewan-Nelson and Missouri River drainages in Southern Alberta and Saskatchewan. It may be reasonable to assume the SR function can be applied to Cordilleran Sucker, given the similarity of their physical characteristics (prior to 2023 both species were classified under a single species, Mountain Sucker); however, there is no data to confirm this assumption. Therefore, more data is required and caution should be taken when using this function on other species.

# Detailed SR Function Description

Derivation of the function:

## Habitat loss is defined as a proportion of the total habitat that has been lost (relative to pristine or historical conditions). Habitat loss could also be the amount of habitat that has been converted to non-suitable habitat.

Source of stressor data to apply the function:

Practical application of the SR function necessitates that users obtain estimates of stressor magnitude (level) in the target system. We don’t currently have data on habitat loss or biomass density data to compare pre- and post- habitat destruction.

# Stressor-Response Function

**Figure 1:** Stressor-response (SR) function for habitat loss (%) and Plains Sucker system capacity (%).

# Stressor-Response Table

**Table 1:** Inflection points and limits used to create SR function for Plains Sucker.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Habitat Loss (%)** | **Mean System** **Capacity (%)** | **SD** | **Lower Limit** | **Upper Limit** |
| 0 | 100 | 0 | 0 | 100 |
| 20 | 80 | 0 | 0 | 100 |
| 40 | 60 | 0 | 0 | 100 |
| 60 | 40 | 0 | 0 | 100 |
| 100 | 0 | 0 | 0 | 100 |

# SR Curve Confidence and Sources of Uncertainty

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low Confidence** | **Moderate Confidence** | **High Confidence** |
| **Data Source for SR Function** | **X** |  |  |
| Rationale --> | This SR function was developed using expert opinion, based on field observation and knowledge of literature on Mountain Sucker, the species under which Plains Sucker was previously called. |
| **Shape of SR Function** | **X** |  |  |
|  Rationale --> | The general shape of the function is likely correct but minimum and maximum values are estimated. |
| **Data Variance/****Consistency** | **X**  |  |  |
|  Rationale --> | Since the SR function was developed from expert opinion there is no data to compare to the curve, nor to show consistency within or among populations. |
| **Applicability to System** |  | **X** |  |
|  Rationale --> | This SR function was developed from expert opinion based on field observation of Plains Sucker, and thus are specific to the Missouri River drainage and Saskatchewan-Nelson drainage during summer months. There is no age-specific data available. |
| **Potential Stressor Interactions**  | **X** |  |  |
|  Rationale --> | There is a high probability that other variables will influence the shape of the stressor-response function. The interaction between temperature (or any other environmental stressor) and DO have not been studied using statistical analysis or in a controlled laboratory setting. |

# Recommended Citation

Jarvis, L. 2022. Habitat loss stressor-response function for Plains Sucker. Department of Fisheries and Oceans CEMPRA model for Plains Sucker.

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# References