Habitat loss and Athabasca Rainbow Trout

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Species Information

Common Name: Athabasca Rainbow Trout
Genus: Oncorhynchus mykiss

Stressor Details

Stressor Name: Habitat loss
Units: % of stream habitat lost
Metric: Stream habitat loss
Scale: linear
Function Type: continuous
Vital Rate/Process: System capacity

Life Stage & Context

Life Stages: Adults
Geography: Alberta foothills watersheds, excluding National Parks
Activity: All activities
Season: All seasons

Descriptions

Overview

> Habitat loss and degradation is often cited as a major impact and limiting factor for fish populations (e.g., native trout recovery plans). This stressor-response curve is exclusively meant to capture direct habitat loss. Direct habitat loss is defined as the removal of portions of a natural stream, or replacement of portions of a natural stream with a different landscape feature. For example, strip-mining for coal in parts of the native trout range has deleted some stream sections, or has resulted in the replacement of streams sections with open-pit lakes or with channeled stream analogs (i.e., a ditch) that do not provide trout habitat. The stressor-response curve for habitat loss is depicted by a linear relationship between the percentage of stream habitat lost and system capacity (Figure 1).

Function Derivation

> Expert opinion; Unpublished

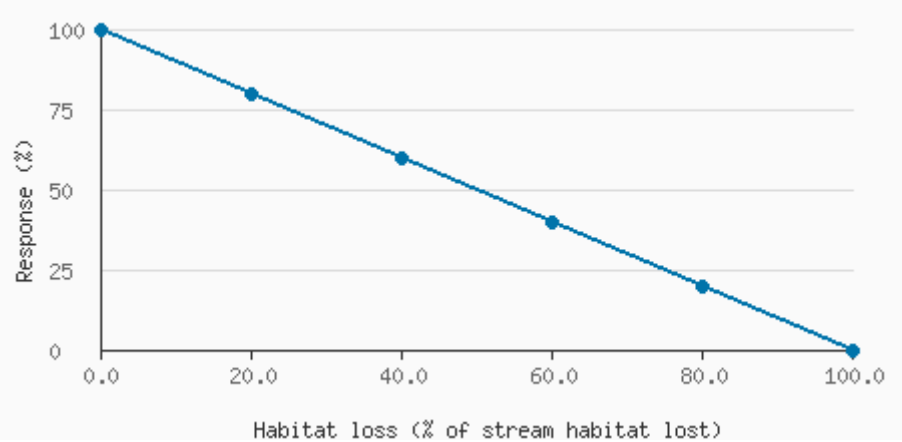
Transferability of Function

> This function was developed and applied to Bull Trout, Athabasca Rainbow Trout, and Westslope Cutthroat Trout in Alberta foothills watersheds. The generality of this curve indicates that it could be safely applied to any species or system where proportion of direct habitat loss could be calculated.

Source of Stressor Data

> GIS-derived estimates of stream habitat lost or converted to different landscape features in the spatial unit of interest.

Stressor Response Data



Habitat Loss (%)	Mean System Capacity (%)	SD	low.limit	up.limit
0	100	0	0	100
20	80	0	0	100
40	60	0	0	100
60	40	0	0	100
80	20	0	0	100
100	0	0	0	100

Citations

Government of Alberta. 2024. Direct habitat loss stressor-response function for Athabasca Rainbow Trout, Westslope Cutthroat Trout, and Bull Trout. Environment and Protected Area Native Trout Cumulative Effects Model.