

Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed
☐	☒ The exact sample size (<i>n</i>) for each experimental group/condition, given as a discrete number and unit of measurement
☒	☐ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒ The statistical test(s) used AND whether they are one- or two-sided <i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i>
☐	☒ A description of all covariates tested
☐	☒ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒ For null hypothesis testing, the test statistic (e.g. <i>F</i> , <i>t</i> , <i>r</i>) with confidence intervals, effect sizes, degrees of freedom and <i>P</i> value noted <i>Give <i>P</i> values as exact values whenever suitable.</i>
☒	☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐ Estimates of effect sizes (e.g. Cohen's <i>d</i> , Pearson's <i>r</i>), indicating how they were calculated

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection	Measure J2X software was used in recording tree ring measurements.
Data analysis	R version 4.1.0 was used for all data analyses.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

All relevant data is available on figshare: <https://doi.org/10.6084/m9.figshare.24179658.v3>

Research involving human participants, their data, or biological material

Policy information about studies with [human participants or human data](#). See also policy information about [sex, gender \(identity/presentation\), and sexual orientation](#) and [race, ethnicity and racism](#).

Reporting on sex and gender	Sex and gender are not reported or relevant to this study.
Reporting on race, ethnicity, or other socially relevant groupings	Human participants were First Nations (Teslin Tlingit) as reported in the manuscript.
Population characteristics	n/a
Recruitment	Participants were identified and recruited by the Teslin Tlingit Council Department of Heritage, Lands, and Natural Resources.
Ethics oversight	The study protocol was approved by the University of Calgary Research Ethics Board, Yukon Government, and Teslin Tlingit Council.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☐ Behavioural & social sciences ☒ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Ecological, evolutionary & environmental sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	In this study, we tested relationships of white spruce (<i>P. glauca</i>) growth ($n = 220$) and Chinook salmon (<i>O. tshawytscha</i>) abundance data ($n = 5, 41$) for 5 riparian sites in southern Yukon territory, Canada. Three site types were included (positive control [$n = 1$], treatment [$n = 3$], negative control [$n = 1$]). We also tested relationships of nitrogen isotopes and site type for 3 sites: a positive control ($n = 1$), treatment ($n = 1$), and negative control ($n = 1$), to investigate a potential mechanism of salmon-tree growth relationships. We interviewed Teslin Tlingit knowledge holders ($n = 3$) to study other ecosystem roles of salmon and salmon decline. This mixed methods approach allowed us to construct a larger picture of the ecosystem roles of salmon in a previously unstudied system.
Research sample	<i>P. glauca</i> were chosen as they represent the long-term stable riparian community for the area. 40-50 samples were taken per site based on a doubling of the sample sizes for some other similar studies ($N \sim 25$), as we expected our effect sizes might be harder to detect due to the relatively extreme environment where sampling occurred. Sample sizes for nitrogen analyses were determined post-hoc based on the number of samples that were suitably intact for analysis from tree cores. Interview sample size was limited by the COVID-19 pandemic but was suitable based on the expert knowledge of interviewees.
Sampling strategy	Sample size was approximately doubled from comparable studies to ensure an effect was found if present.
Data collection	Data collection was conducted collaboratively by the corresponding author and third author (Sarah Knude) and included consistency checks (e.g. the collectors measuring the same tree core to ensure matching values).
Timing and spatial scale	Data collection occurred in June and July of 2021.
Data exclusions	No data were excluded.
Reproducibility	Multiples of site types were included where possible to reproduce results. We followed similar methods to comparable studies.
Randomization	All trees at every site were sampled. Sites were selected based on ecological similarity to each other for reproducibility.
Blinding	Blinding was not needed as measurements could not be influenced by the researchers.

Did the study involve field work? ☒ Yes ☐ No

Field work, collection and transport

Field conditions	Study conditions were standard for spring/summer in the area. Water levels were high. We were focused on longterm patterns in tree growth and nitrogen composition, so seasonal variability in the year of collection should not influence our results.
Location	Teslin Tlingit Council Traditional Territory (areas surrounding Teslin, Yukon).
Access & import/export	Habitats were accessed by foot or boat.
Disturbance	n/a

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern
☐	☒ Plants

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Dual use research of concern

Policy information about [dual use research of concern](#)

Hazards

Could the accidental, deliberate or reckless misuse of agents or technologies generated in the work, or the application of information presented in the manuscript, pose a threat to:

No	Yes
☒	☐ Public health
☒	☐ National security
☒	☐ Crops and/or livestock
☒	☐ Ecosystems
☒	☐ Any other significant area

Experiments of concern

Does the work involve any of these experiments of concern:

No	Yes
☒	☐ Demonstrate how to render a vaccine ineffective
☒	☐ Confer resistance to therapeutically useful antibiotics or antiviral agents
☒	☐ Enhance the virulence of a pathogen or render a nonpathogen virulent
☒	☐ Increase transmissibility of a pathogen
☒	☐ Alter the host range of a pathogen
☒	☐ Enable evasion of diagnostic/detection modalities
☒	☐ Enable the weaponization of a biological agent or toxin
☒	☐ Any other potentially harmful combination of experiments and agents

Plants

Seed stocks

n/a

Novel plant genotypes

n/a

Authentication

n/a