

# A collaborative approach towards Arctic grayling recovery within the Swan River watershed

KATE MAROUELLI<sup>1,2</sup>, ALLYSON K. MENZIES<sup>2</sup>, TODD BAILEY<sup>3</sup>, KAINE GIROUX<sup>3</sup>, BENJAMIN C. KISSINGER<sup>1,2</sup>

<sup>1</sup>FRI Research Hinton, AB, <sup>2</sup>Department of Biological Sciences, University of Calgary, Calgary, AB, <sup>3</sup>Swan River First Nation, Kinuso, AB

## Significance

Data regarding distributions and abundance of Arctic grayling within Alberta is limited. This knowledge gap needs to be filled to improve conservation efforts for this culturally significant fish species.



Members of Swan River First Nation have lost a treaty right to harvest an important traditional food source and the ability pass down Traditional Knowledge that is tied to the species.

## Arctic grayling

Populations have declined by 70% since the 1960s, leading to a province wide zero harvest limit [2].

They rely on cold, clean, and connected waters to support their **complex migration patterns**, which can range up to 50 km [5].



## Swan River Watershed

- Human footprint is 34%, 5% higher than provincial average [1].
- As of 2023, access roads have increased by 1.5x in 25 years [1].
- As of 2015, 92% of stream crossings, structures commonly built to maintain stream flow and fish passage, were barriers to fish movement [3].

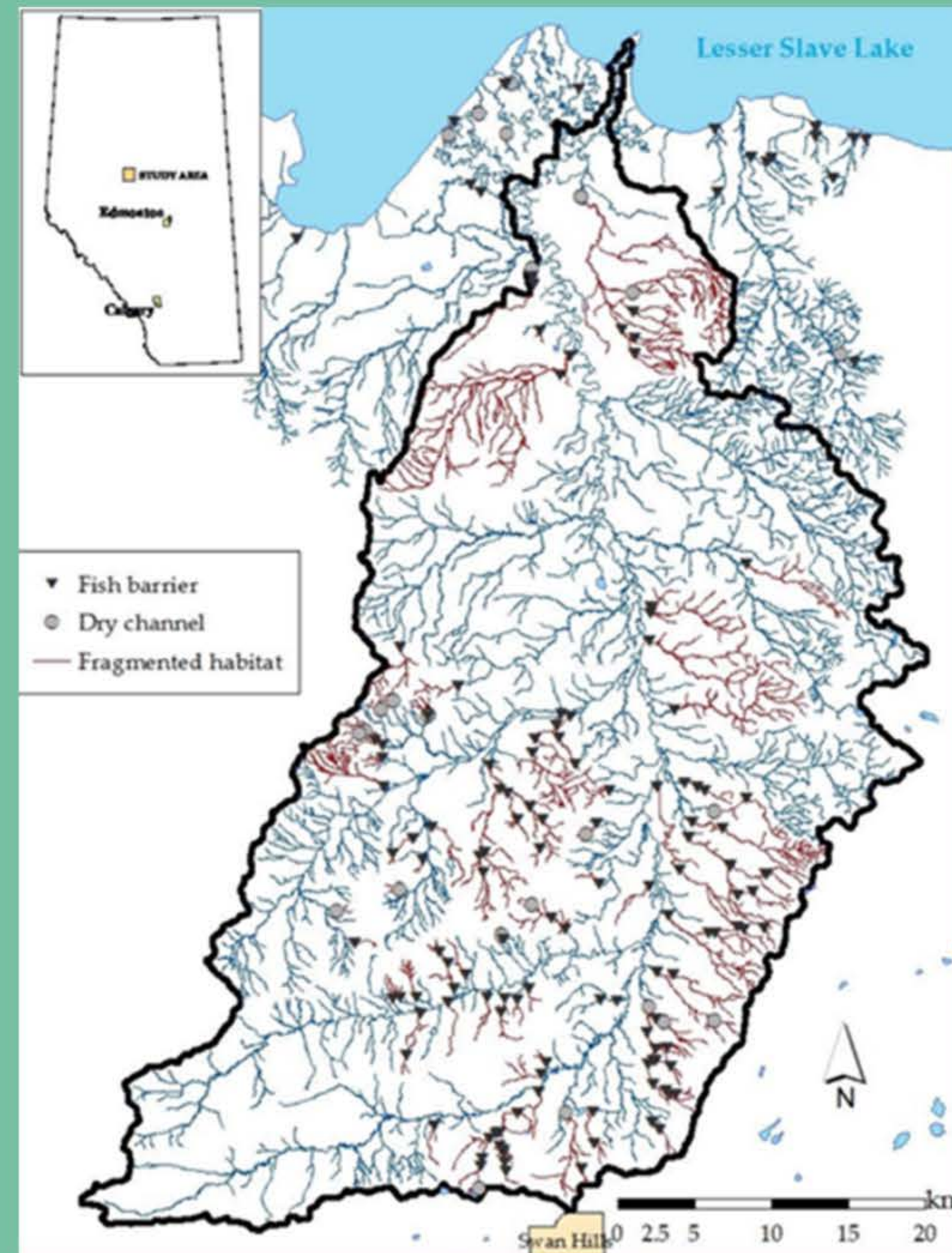


Figure 1. Habitat fragmentation in the Swan River watershed due to stream crossings. Habitat inaccessible to fish populations found in red. [3]

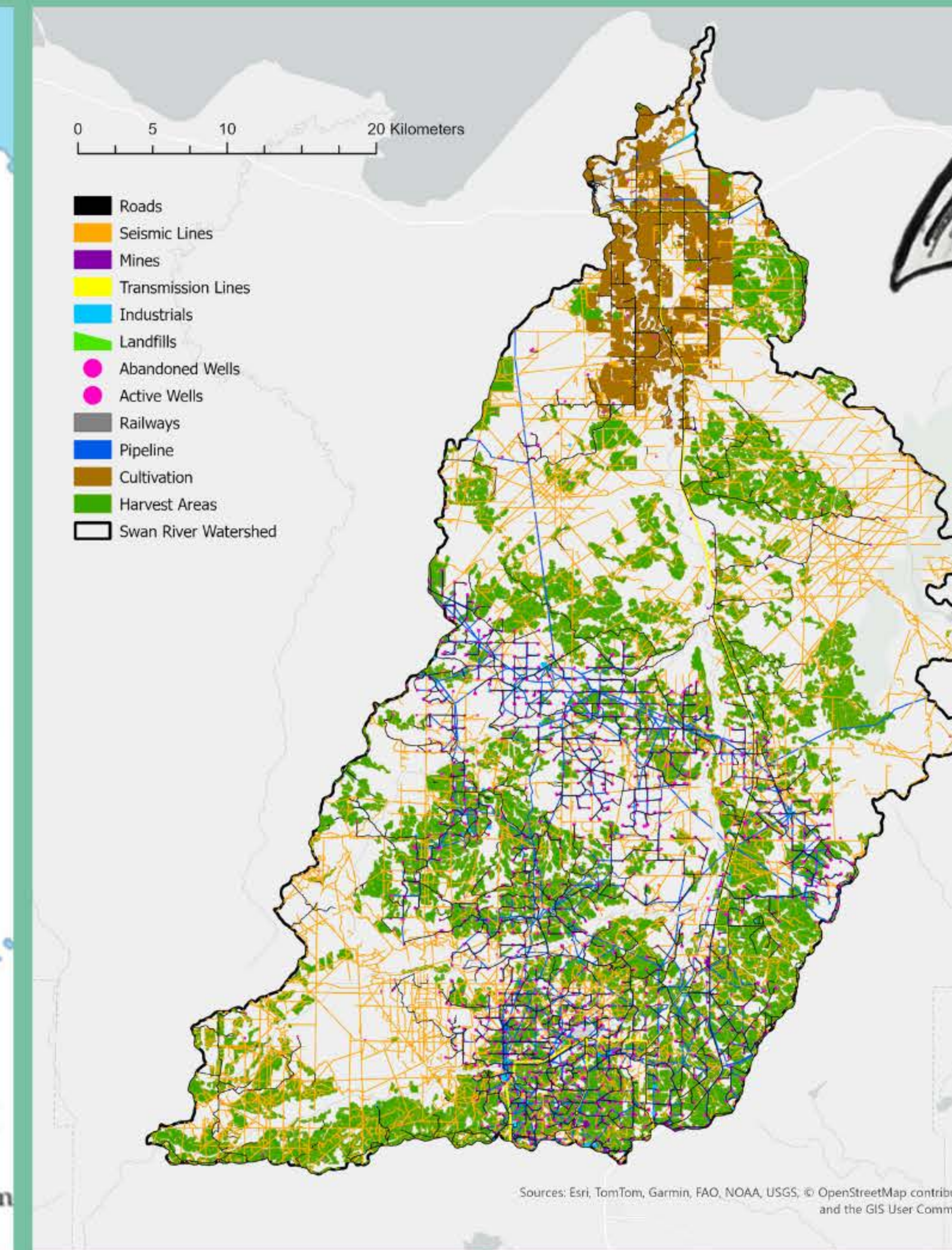


Figure 2. Human footprint illustrating total land use in the Swan River watershed [1].

## Data Summary Report

This report was prepared for Swan River First Nation in March 2025 to better identify next steps for Arctic grayling recovery within the Swan River watershed.

Outlining work that has been done to date such as, crossing prioritizations, habitat surveys, eDNA, Fisheries and Wildlife Management Information System Data (FWMIS), and spill incident data [4].



## Objectives

- 1 Reassess Arctic grayling abundance within the Swan River watershed.
- 2 Reassess stream crossings and habitat connectivity within the Swan River watershed.
- 3 Document historical Arctic grayling abundance and distribution through interviews with Swan River First Nation community members.

## Next Steps

- Reassess current abundance through angling methods,
  - Replication of 2015 assessment [3].
- Reassessment of stream crossings by collecting data on the outlet gap, scour pools and structural maintenance
  - Data will be placed into an open database (Alberta's Watercourse Crossing Inspection App) used to facilitate monitoring of stream crossings in Alberta.



- Conduct Traditional Ecological Knowledge interviews with community members.

By weaving western science and Traditional Knowledge, this collaborative approach will:

1. update the status of Arctic grayling within the watershed,
2. pinpoint areas where crossing remediation would yield the greatest benefit, and
3. contribute to revitalization of an important treaty right to members of Swan River First Nation.

[1] Alberta Biodiversity Monitoring Institute. 2023. ABMI Website: Alberta Biodiversity Monitoring Institute. 2023. ABMI Website: <https://abmi.ca>.

[2] Alberta Environment and Parks (AEP) and Alberta Conservation Association (ACA). (2015). Status of the Arctic Grayling (*Thymallus arcticus*) in Alberta: Update 2015. Alberta Environment and Parks. Alberta Wildlife Status Report No. 57 (Update 2015). Edmonton, AB. 96 pp.

[3] Hurkett, B., and L. Redman. (2016). Swan River Arctic grayling and watercourse crossing assessment. Data Report, D-2016-104, produced by Alberta Conservation Association, Lethbridge, Alberta, Canada, 21 pp.

[4] Marouelli, K., Bailey, T., Giroux, K., Kissinger, B. 2025. Information into action: Synthesizing available data and Traditional Knowledge into recommendations for Arctic grayling recovery. FRI Research data summary report. 47 pp.

[5] McPherson, M. D., Lewis, J. B., Cott, P. A., Baker, L. F., Mochnac, N. J., Swanson, H. K., & Poesch, M. S. (2023). Habitat use by fluvial Arctic grayling (*Thymallus arcticus*) across life stages in northern mountain streams. *Environmental Biology of Fishes*. 106:5, 1001–1020. <https://doi.org/10.1007/s10641-023-01388-z>