Understanding deer impacts in northern Fiordland

History and current state of alpine and forest health

September 2024

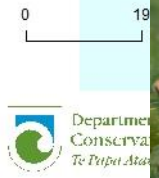
Department of Conservation
Te Papa Atawhai

New Zealand Government

Ungulate Control Programs in FNP

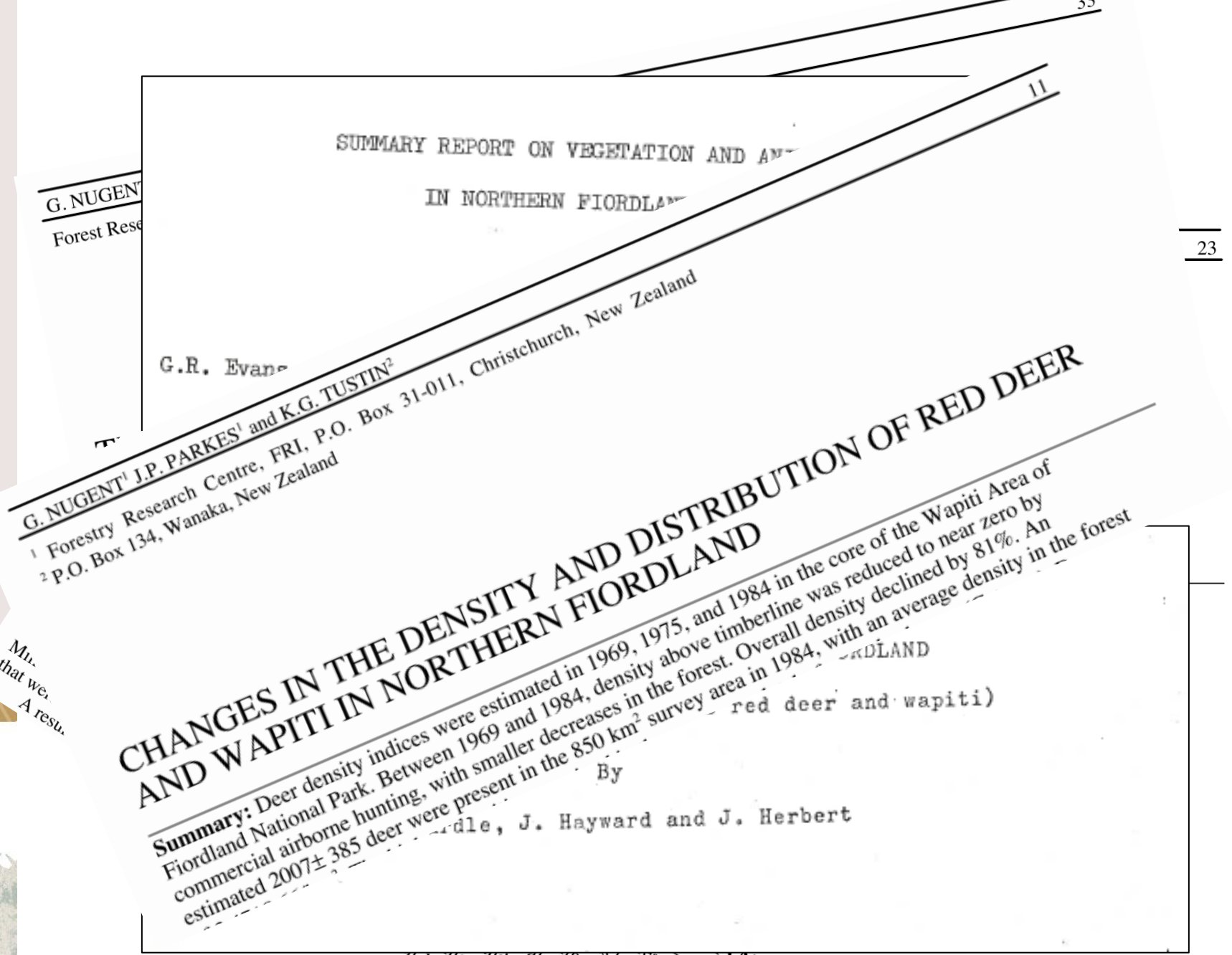
- DOC Led
  - Deer Free Areas
  - Suppression
  - Eradication
- Community Led
  - Fiordland Wapiti Foundation
- Commercial
  - Wild Animal Recovery Operators

Where we do work



Forest and alpine deer and vegetation studies are not new in northern Fiordland

~20 reports between 1960's – 1980's



SUMMARY REPORT ON VEGETATION AND AN

IN NORTHERN FIORDLA

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CHANGES IN THE DENSITY AND DISTRIBUTION OF RED DEER AND WAPITI IN NORTHERN FIORDLAND

Summary: Deer density indices were estimated in 1969, 1975, and 1984 in the core of the Wapiti Area of Fiordland National Park. Between 1969 and 1984, density above timberline was reduced to near zero by commercial airborne hunting, with smaller decreases in the forest. Overall density declined by 81%. An estimated 2007± 385 deer were present in the 850 km² survey area in 1984, with an average density in the forest

red deer and wapiti)

By

dle, J. Hayward and J. Herbert

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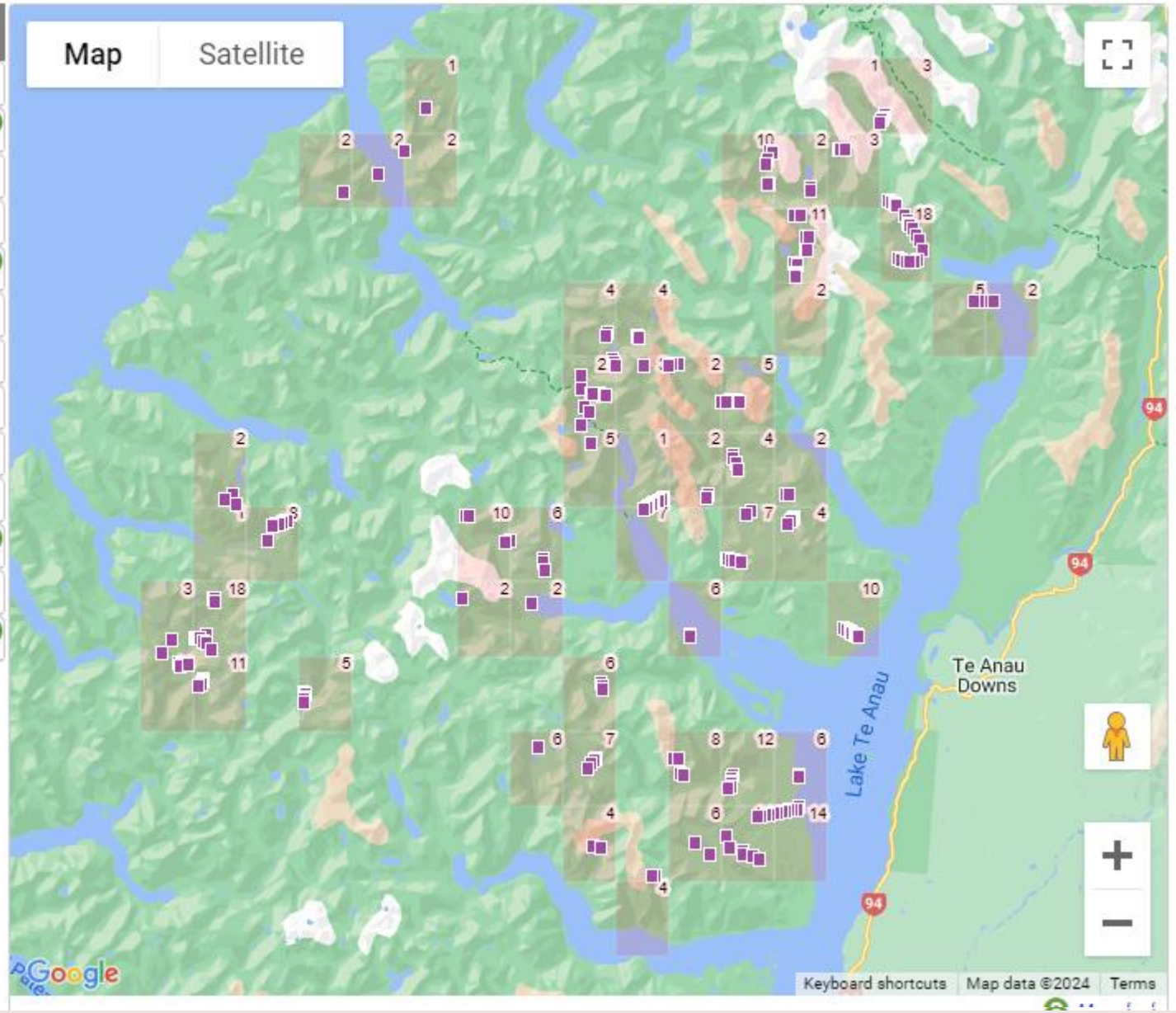
Showing results 1 to 11 from 11 datasets. Total plots in search results: 345

Filters

- Project Date
- Ecological District
- Altitude (m)
- Plot Treatment
- Placement
- Access
- Species
- Species Code
- Family
- Genus
- Palatability to Ungulates
- Biostatus
- Growth Form



What did these studies in the 70's and 80's tell us?

Alpine Areas

(Rose and Platt 1987)

- WARO pressure significantly reduced Wapiti/Red numbers in alpine areas:

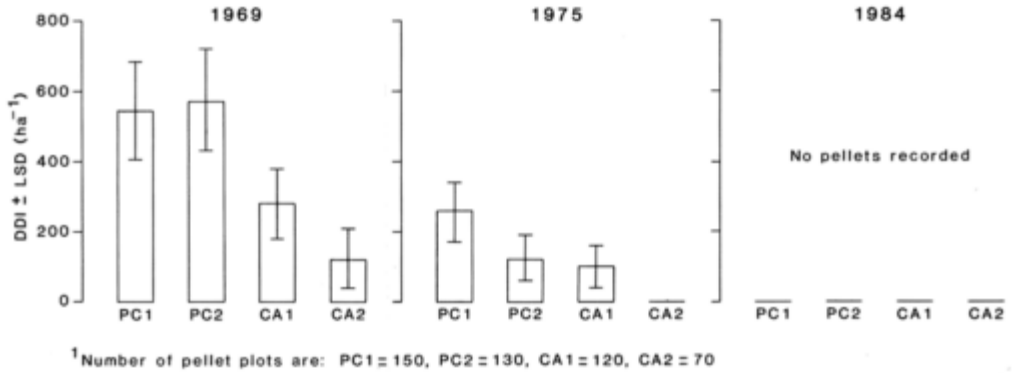


Figure 2: *Deer density index (DDI ±LSD) by grassland type, calculated from the frequency of intact faecal pellets. For DDI = 0, LSD varies from 6-13 ha.*

- The main feature in all three surveys was a large increase between 1969 and 1984 in the frequencies of the large-leaved herbs e.g. white snow marguerite* & mountain daisy**, which occurred in the most fertile, deer preferred, *Chionochloa pallens* grasslands

*Dolichoglottis scorzoneroides** *Celmisia verbacifolia***

What did these studies in the 70's and 80's tell us?

Forested areas

(Stewart et al. 1987; Nugent and Sweetapple 1989)

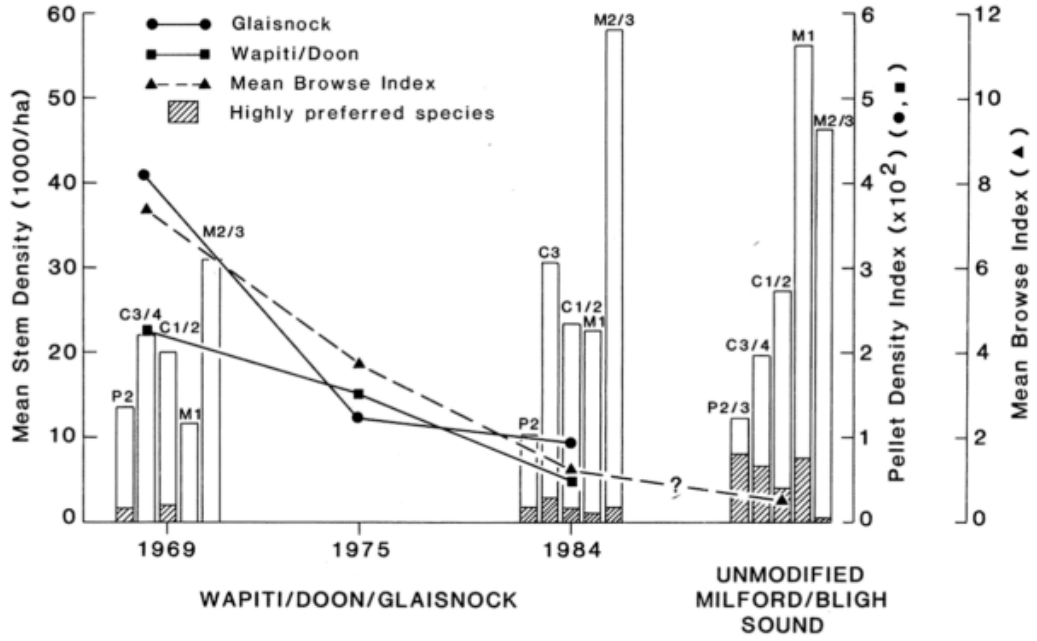


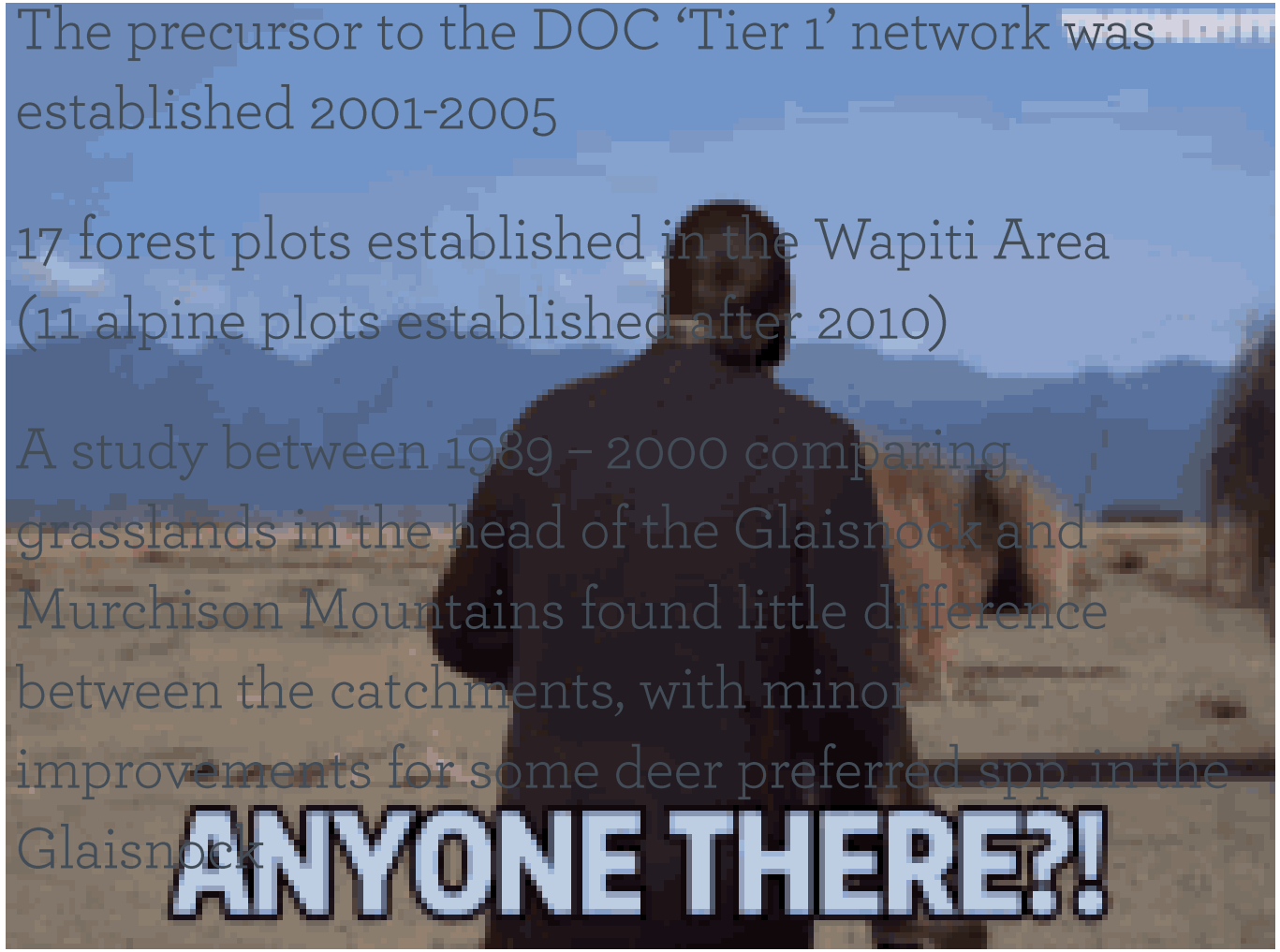
Figure 2: *Mean density of all woody stems and highly preferred stems in the understorey of forest types of the WapitiiDoon/Glaisnock and Milford/Bligh Sound catchments in* 1969 *and* 1984 *in relation to changes in deer numbers (from Nugent et al.,* 1987) *and the mean browse index (Rose and Burrows,* 1985).

- Deer numbers were slower to decline in forested catchments, especially western catchments, and preferred species were slower to recover, and never to the level encountered in deer free forests
- But, significant improvements were made, especially in catchments with a high Tops : Forest ratio

Then what happened ....

1990 – 2006

- The precursor to the DOC ‘Tier 1’ network was established 2001-2005
- 17 forest plots established in the Wapiti Area (11 alpine plots established after 2010)
- A study between 1989 – 2000 comparing grasslands in the head of the Glaisnock and Murchison Mountains found little difference between the catchments, with minor improvements for some deer preferred spp. in the Glaisnock



Meanwhile in the Murchies.....

What do the results of intensive management look like?

Deer were being maintained at ~1 deer/km^2 in forested areas by ground hunters achieving a CPUE of 0.51 deer per hunter day during the mid 2000's.

Near zero density in alpine areas through aerial control (aerial ops were averaging 4 deer/hr)

In 2008 all the forest plots in the murchies were measured: Conclusion – deer preferred species were increasing in the forest, but not in highly preferred deer habitat (e.g. seral forest types)

Alpine deer browse monitoring in 2006 revealed <1% of monitored plants had browse and zero pellets were detected on the 20 transects established

Overall assessment: Alpine areas were pristine, forest was generally ok and palatable species were increasing, but deer were still impacting the regeneration of preferred forest species in deer preferred locations

Break for Questions

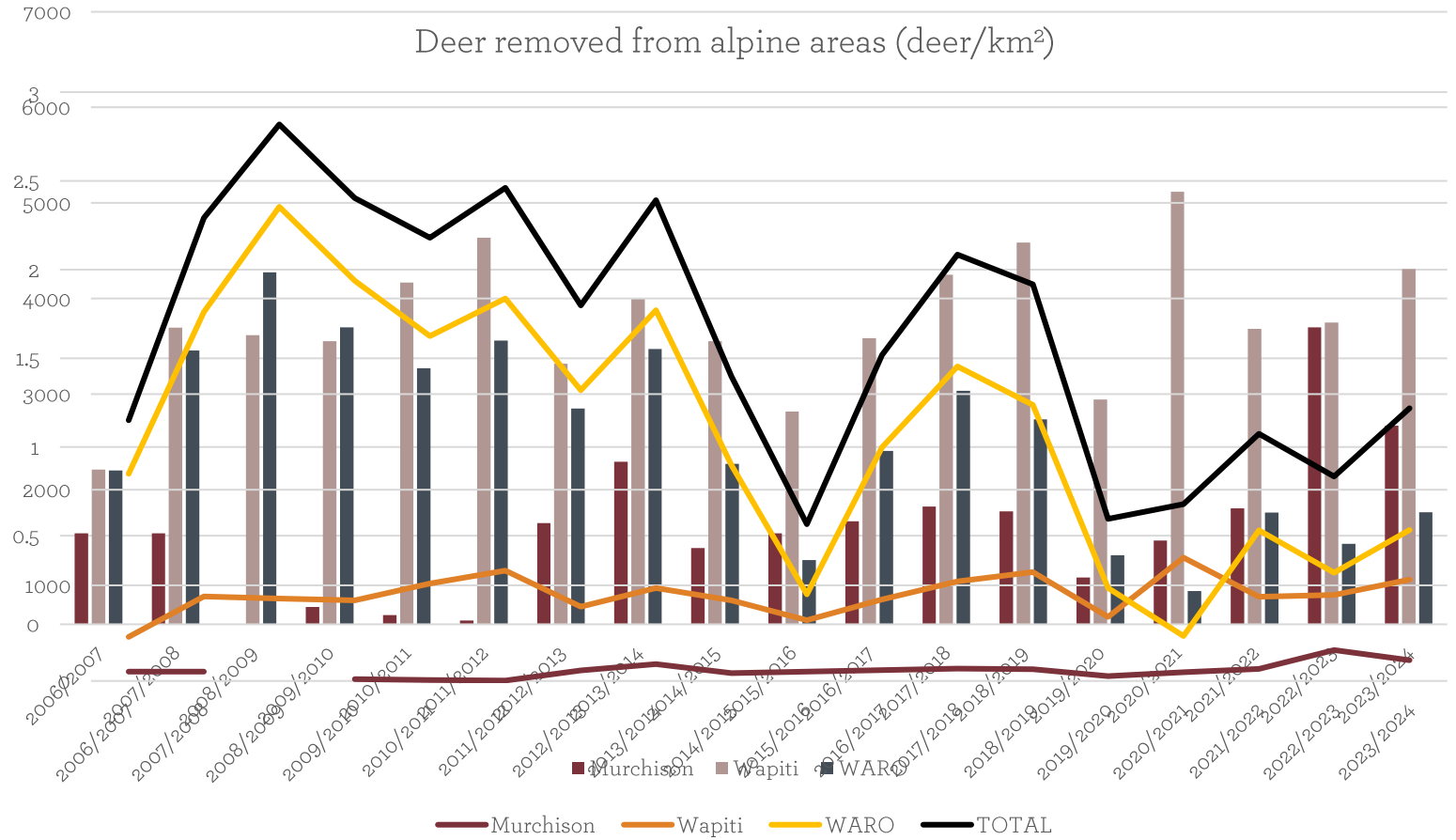
2006 - Today

The establishment of rapid impacts assessment methods to compare across three deer control programs

- The alpine deer browse sites were established across Fiordland to quantify the influence of WARO, FWF and DOC led control on deer impacts in alpine areas
- We also wanted to understand if the changes we saw in the alpine areas were happening in the forest
- Seedling Ratio Index (SRI) transects were established in selected forested catchments
- All this can be analysed against deer control effort in these three management areas

FNP Deer control 2006-2024

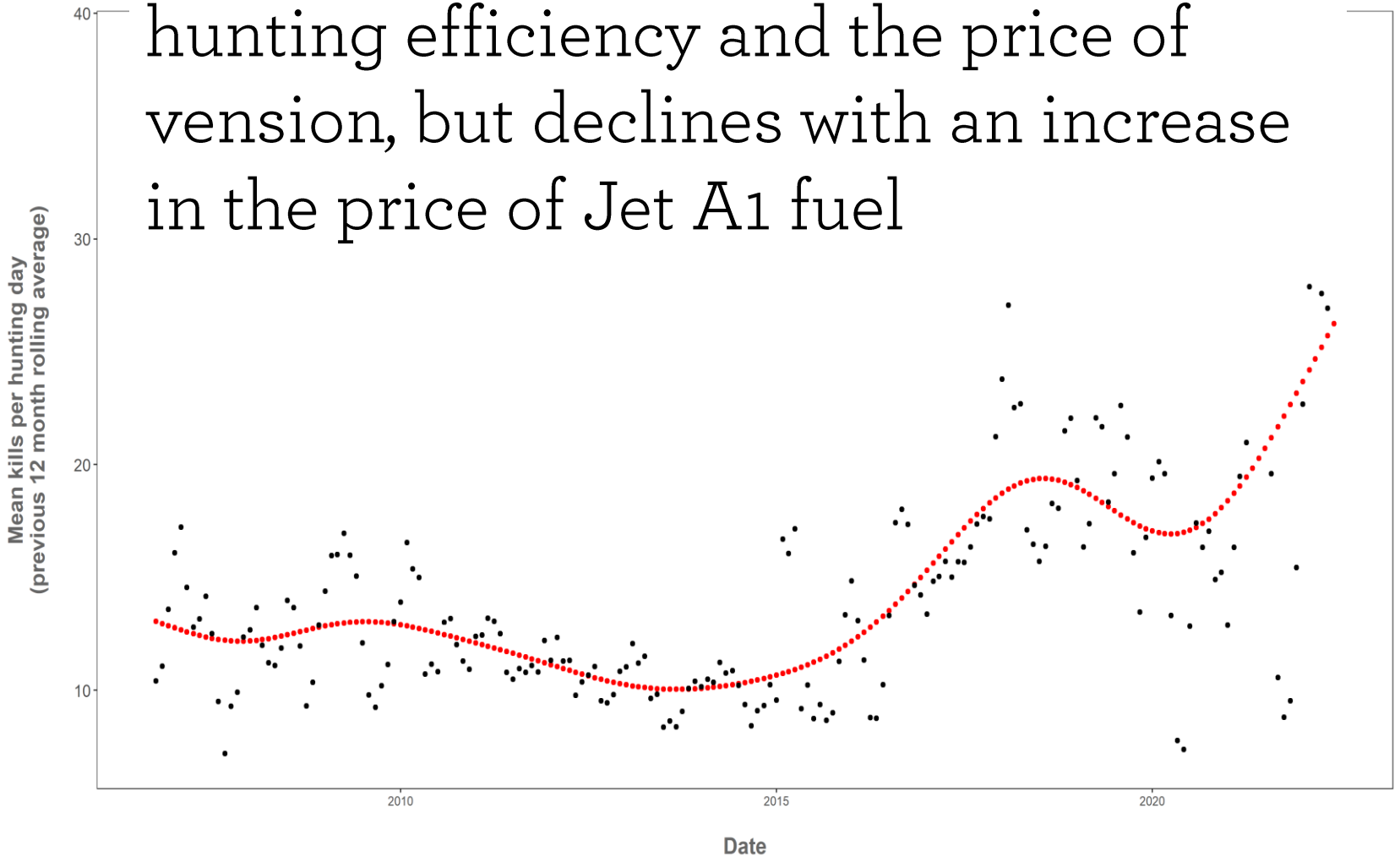
~65,000 deer removed by WARO, WAPITI and DOC



WARO is driven by $$

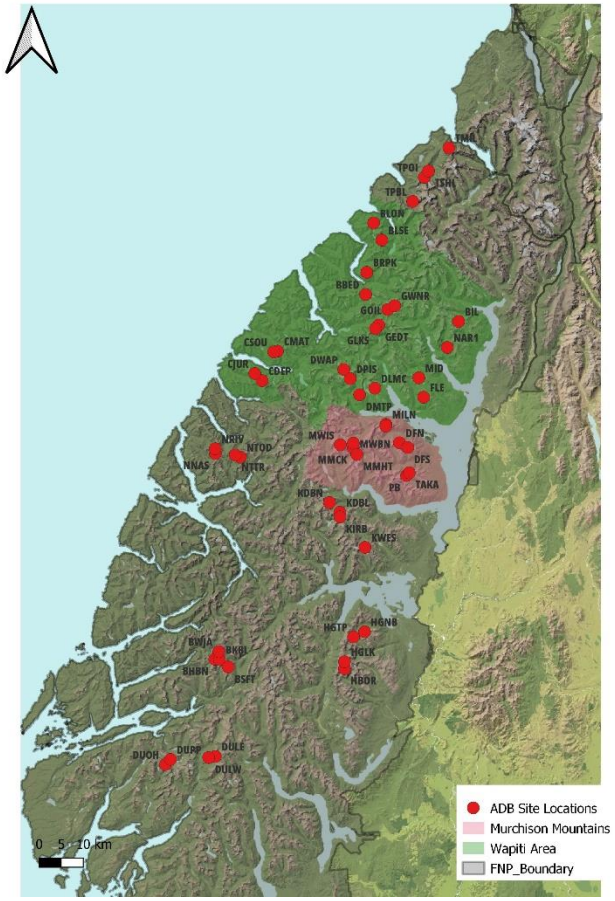
(and processor capacity)

The number of deer killed in the WARO block increases with greater hunting efficiency and the price of vension, but declines with an increase in the price of Jet A1 fuel



Alpine Deer Browse

- Established across Fiordland in 2006 to look at rates of deer browse on selected palatable species in preferred alpine deer habitat
- Measure pellet groups, browse, numbers of individuals and plant size class (1 spp. only)

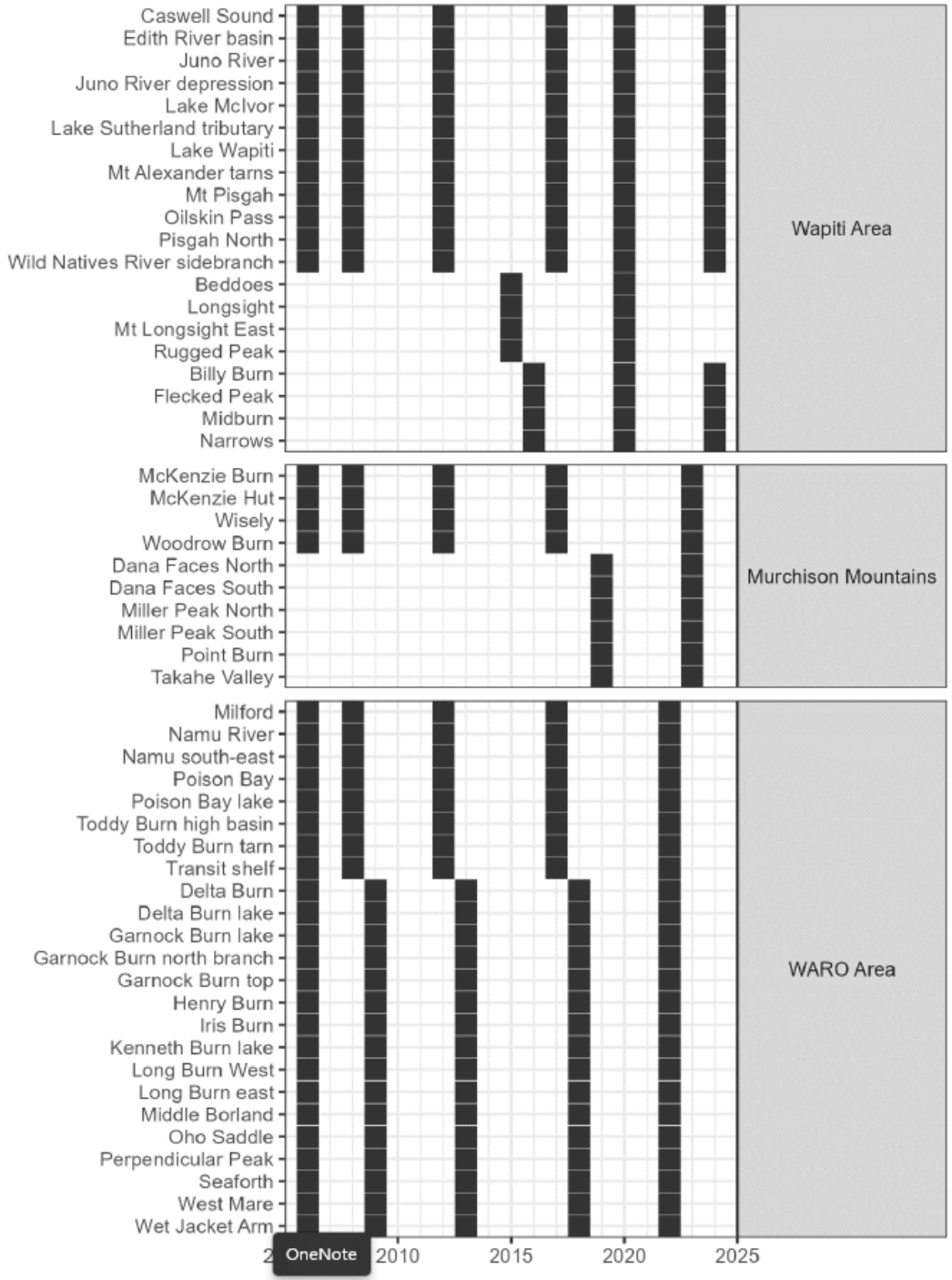


WARO: 24 sites

WAPITI: 20 sites

Murchison: 10 sites

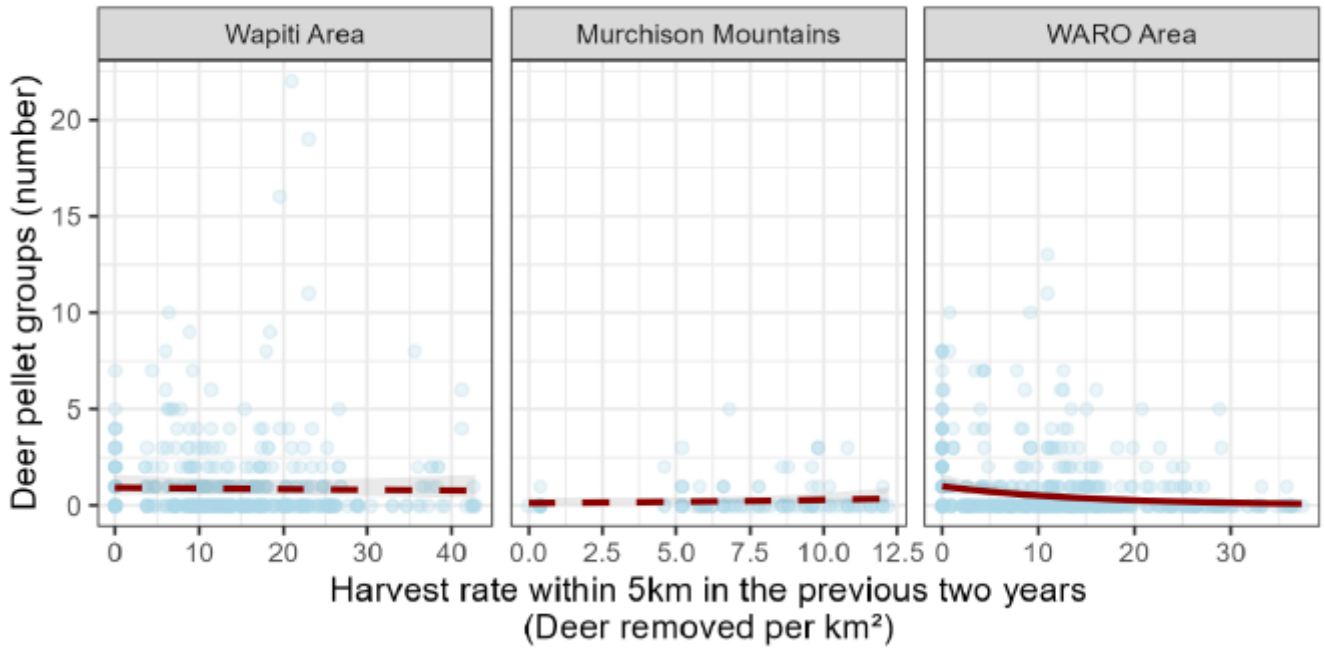
Establishment, cycle and frequency of measurement



- N = 20
- N = 10
- N = 24

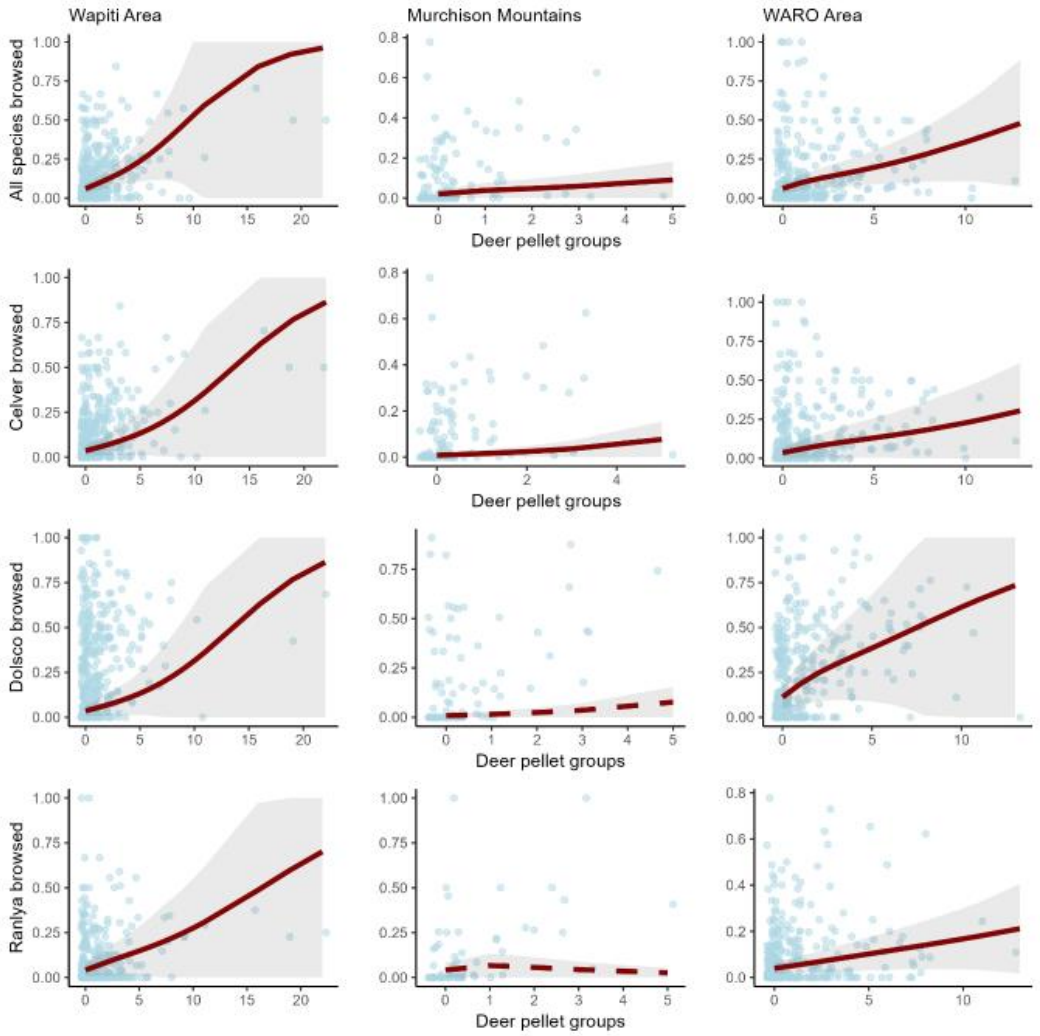
Is there a relationship between harvest rate and deer abundance?

- There is only a significant relationship between harvest rate and deer abundance for the WARO area



Is there a relationship between deer abundance and browse?

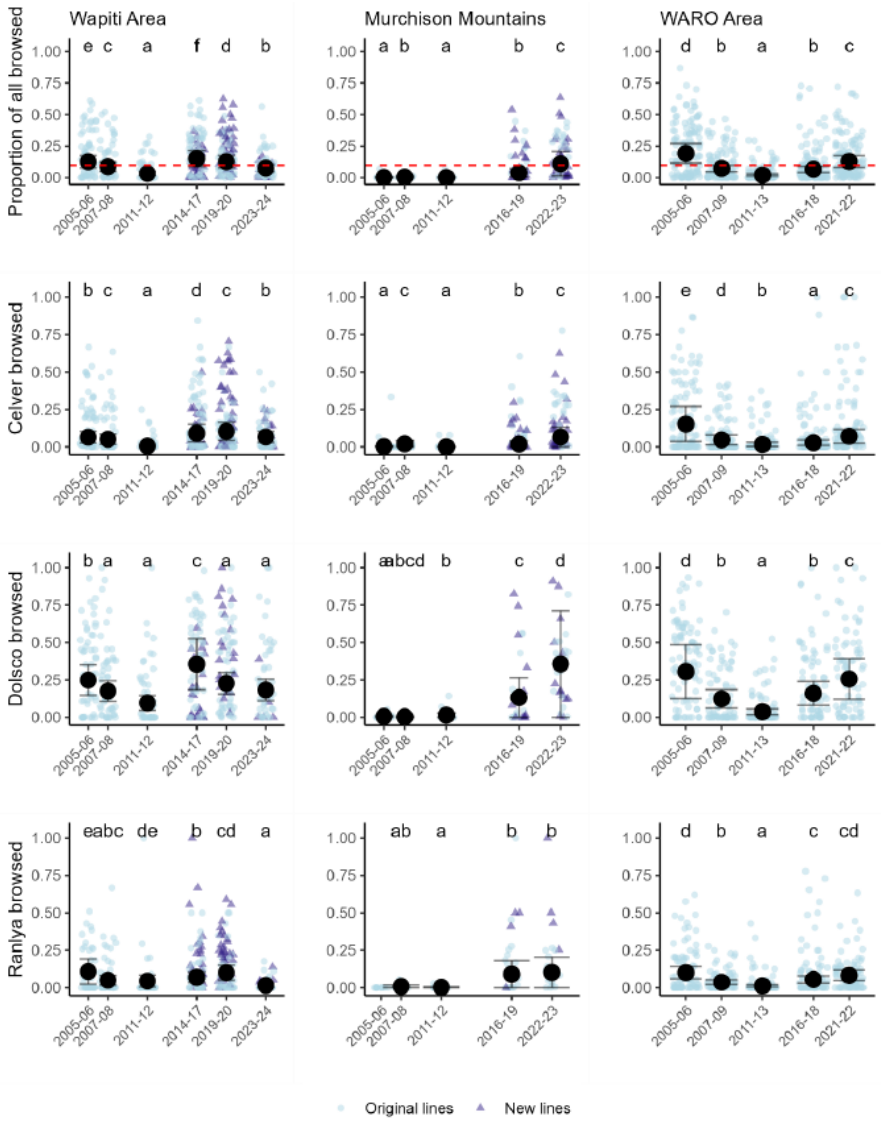
- Yes, positive relationship (i.e. browse increased with increasing pellet groups) for almost all species and areas



Results

Alpine Deer Browse

2006 - 2017



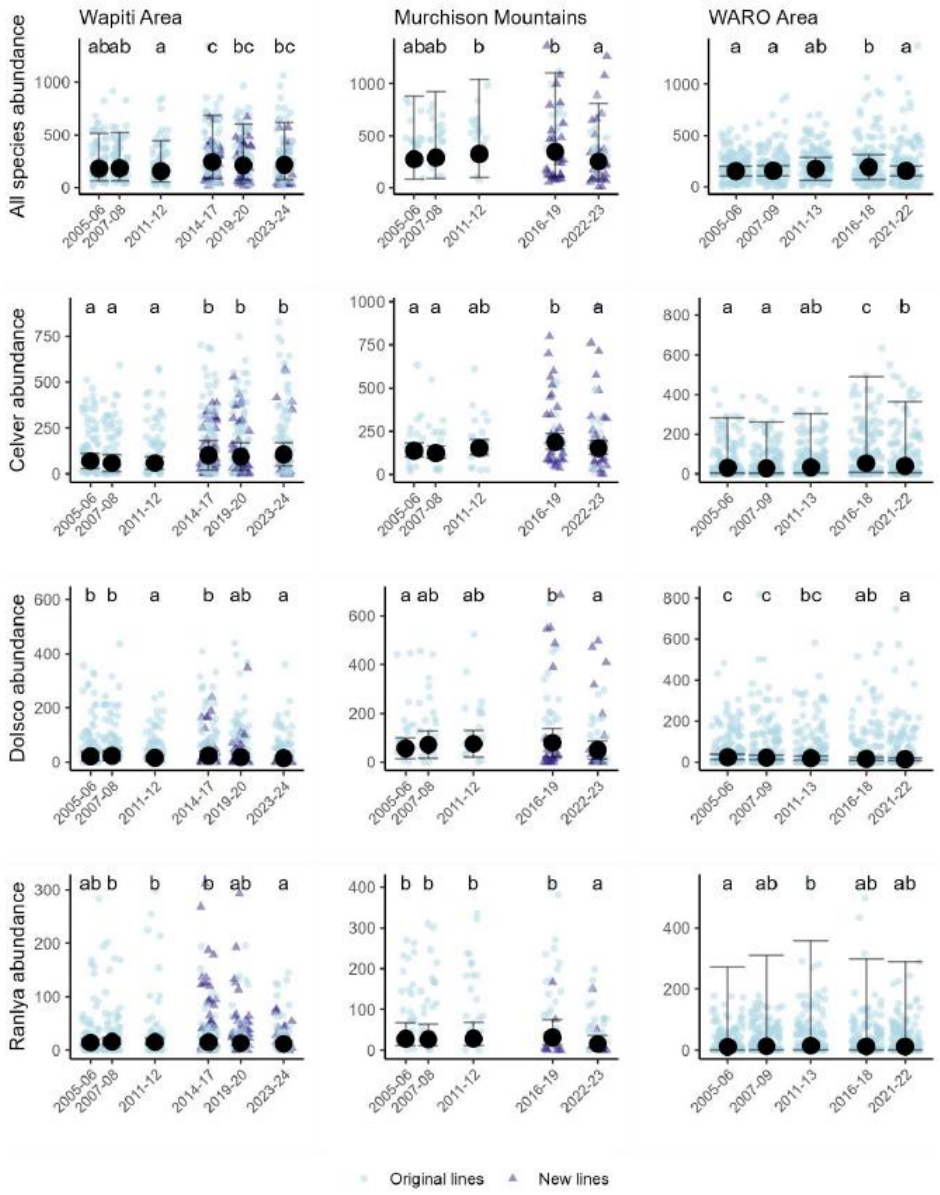
Q: How many kills are required for mean browse to be ≤ 10%?

A: 1,100 deer per annum. (WAPITI) ~ >2.0 deer/km^2

A: 3,500 deer per annum. (WARO) ~ >1.5 deer/km^2

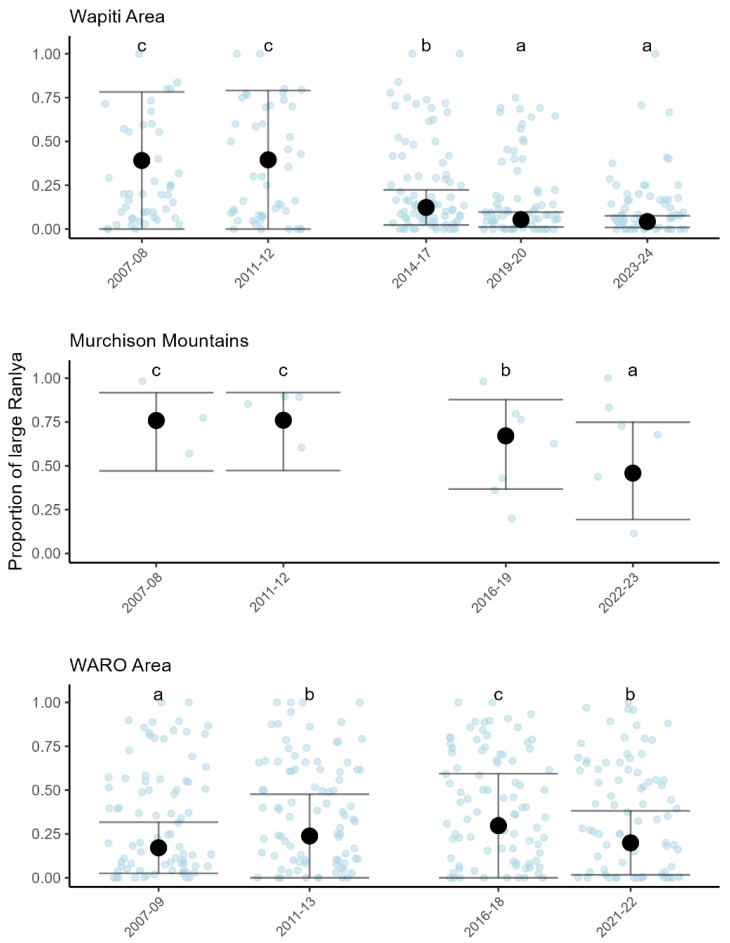
Is plant abundance changing through time?

- Some declines and increases, but no large changes were detected



Do the size classes of RAN lya change with browse

- The proportion of large *Ranunculus lyallii* (leaf width >8cm) significantly decreased with increasing deer pellet groups across all management area



Conclusions:

- Pleasing to see declines in browse in the Wapiti Area,
- Increases in browse in the Murchison mountains is of ongoing concern,
- WARO is getting more browse, as we expected.
- Plant numbers are not dropping off the cliff but there are some changes to keep a watch on.
- The decline in *Ranunculus* demographics from large plants to more smaller plants is of concern, could be related to earlier high browse, need to keep an eye on this.

Break for Questions

Seedling Ratio Index

Comparing deer impacts in the WARO area with the Wapiti and Murchison Mtns Management units

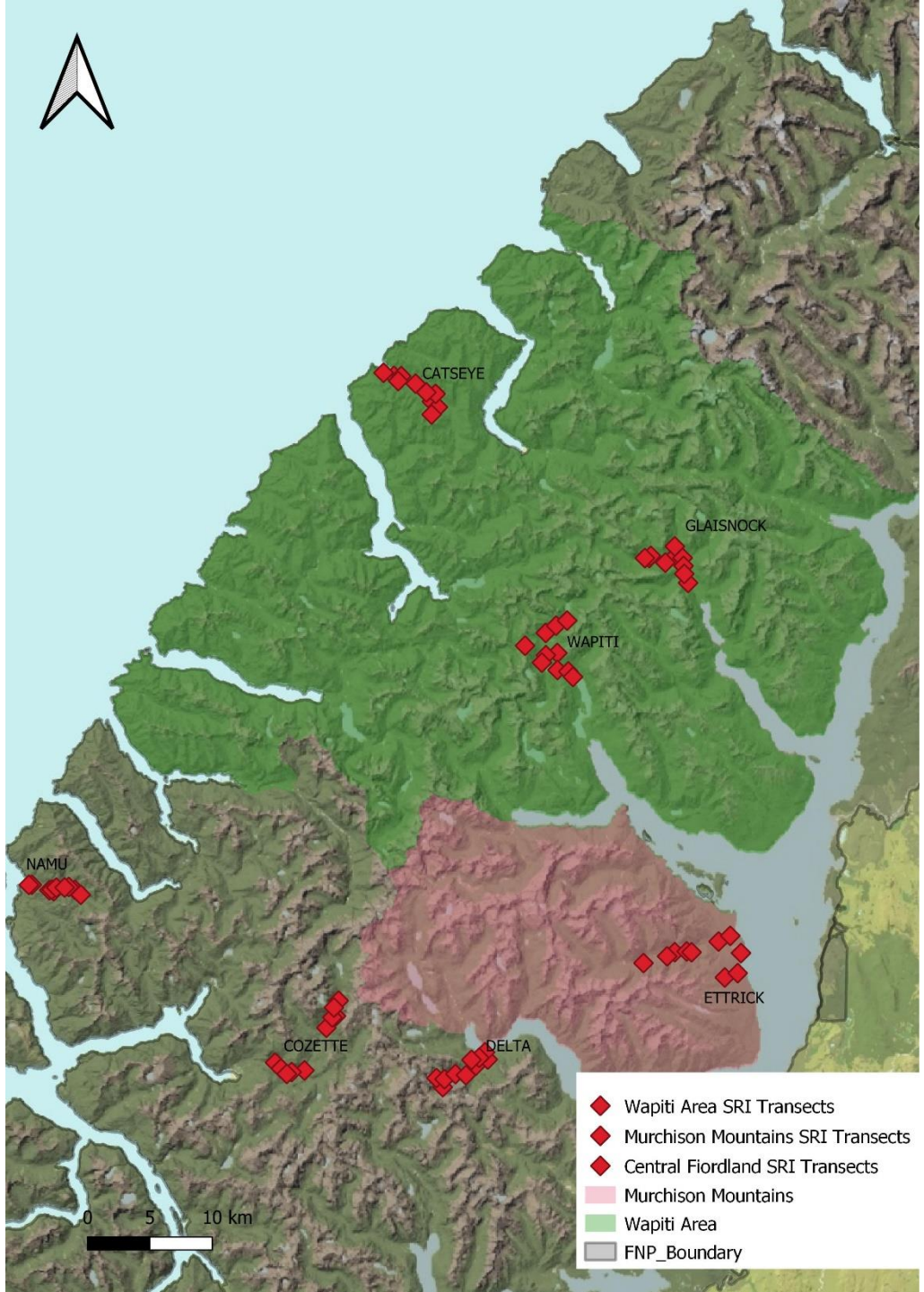
- The method evaluates deer abundance, browse and the ratio of seedlings : saplings for preferred, not selected, and avoided plant species

Positive SRI value – More species in the sapling tier than the seedling tier

Negative SRI value – More species in the seedling tier than the sapling tier

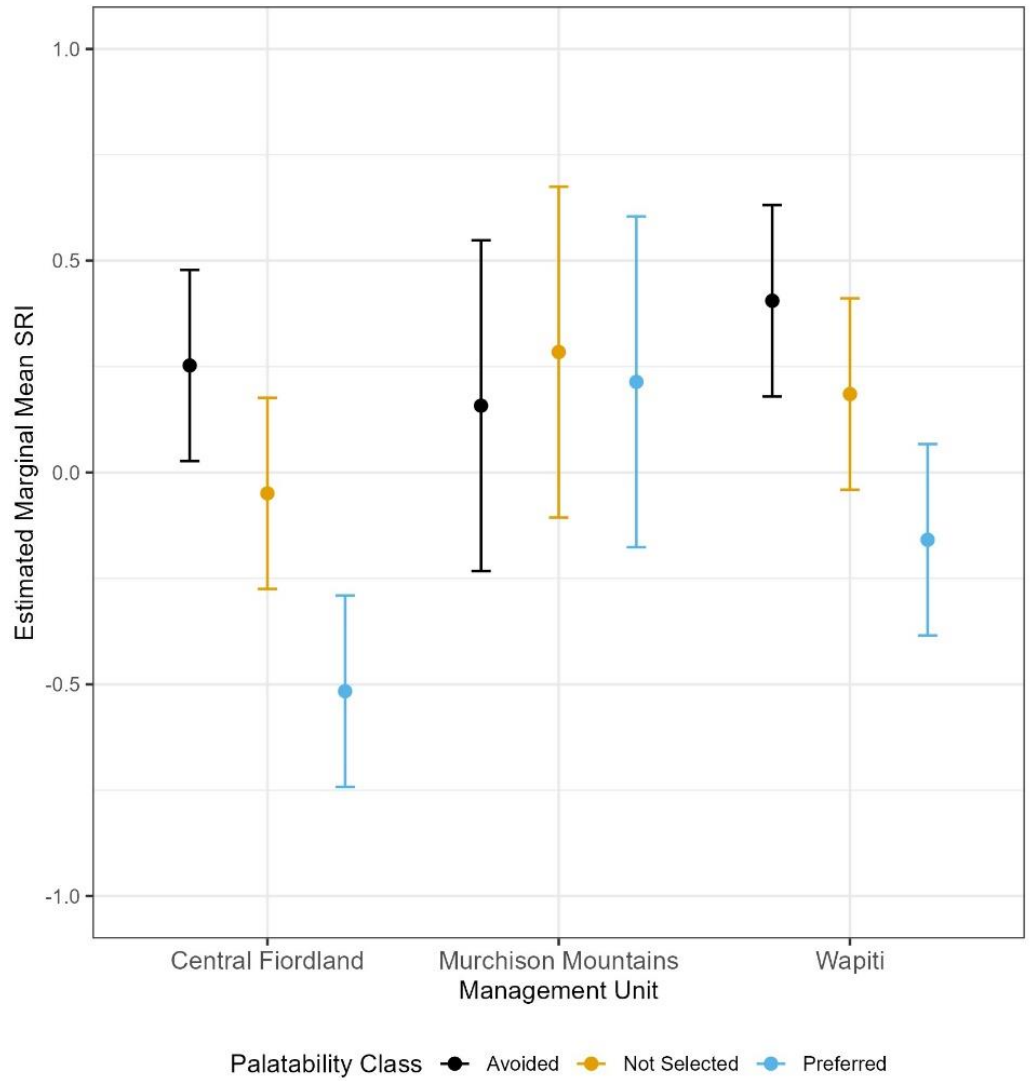
Seedling Ratio Index

Sites established in 2008



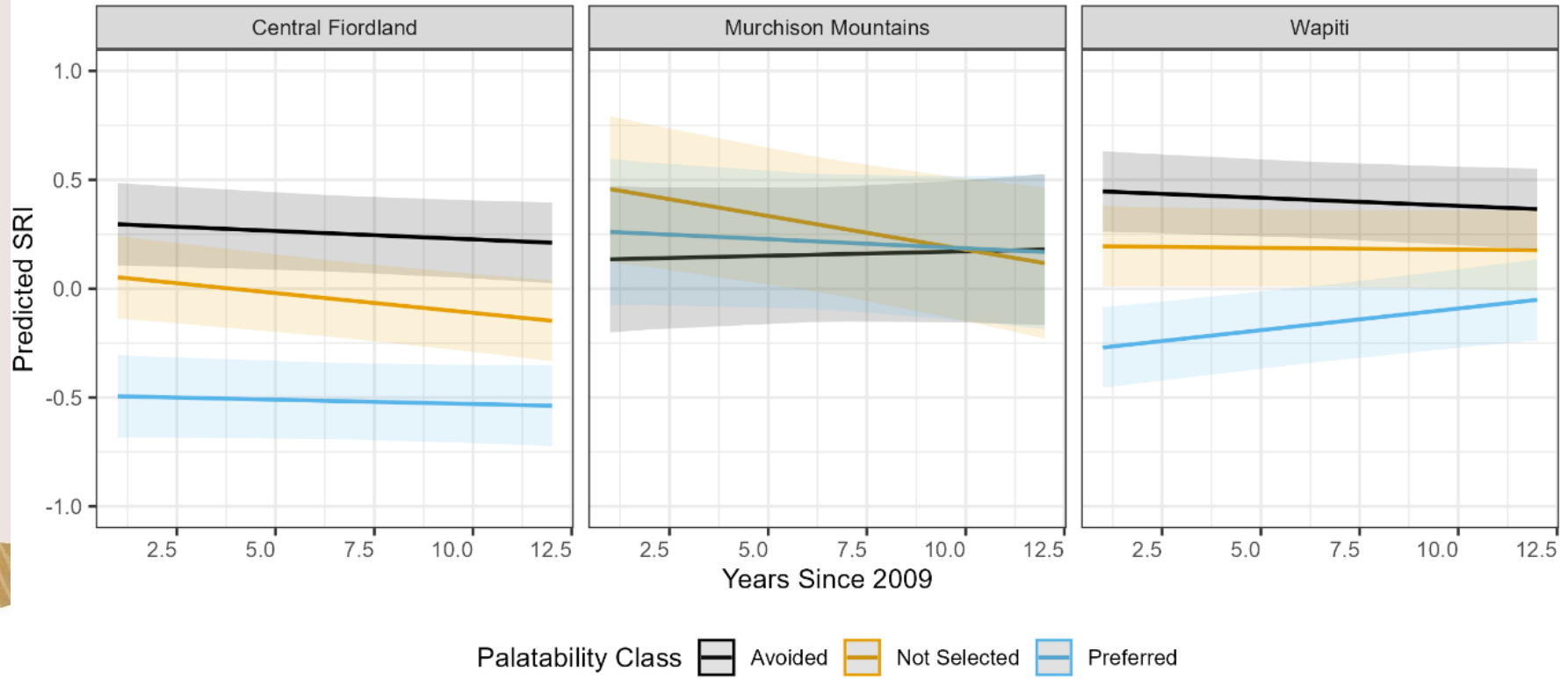
Results

Mean SRI by management unit (all remeasures combined)



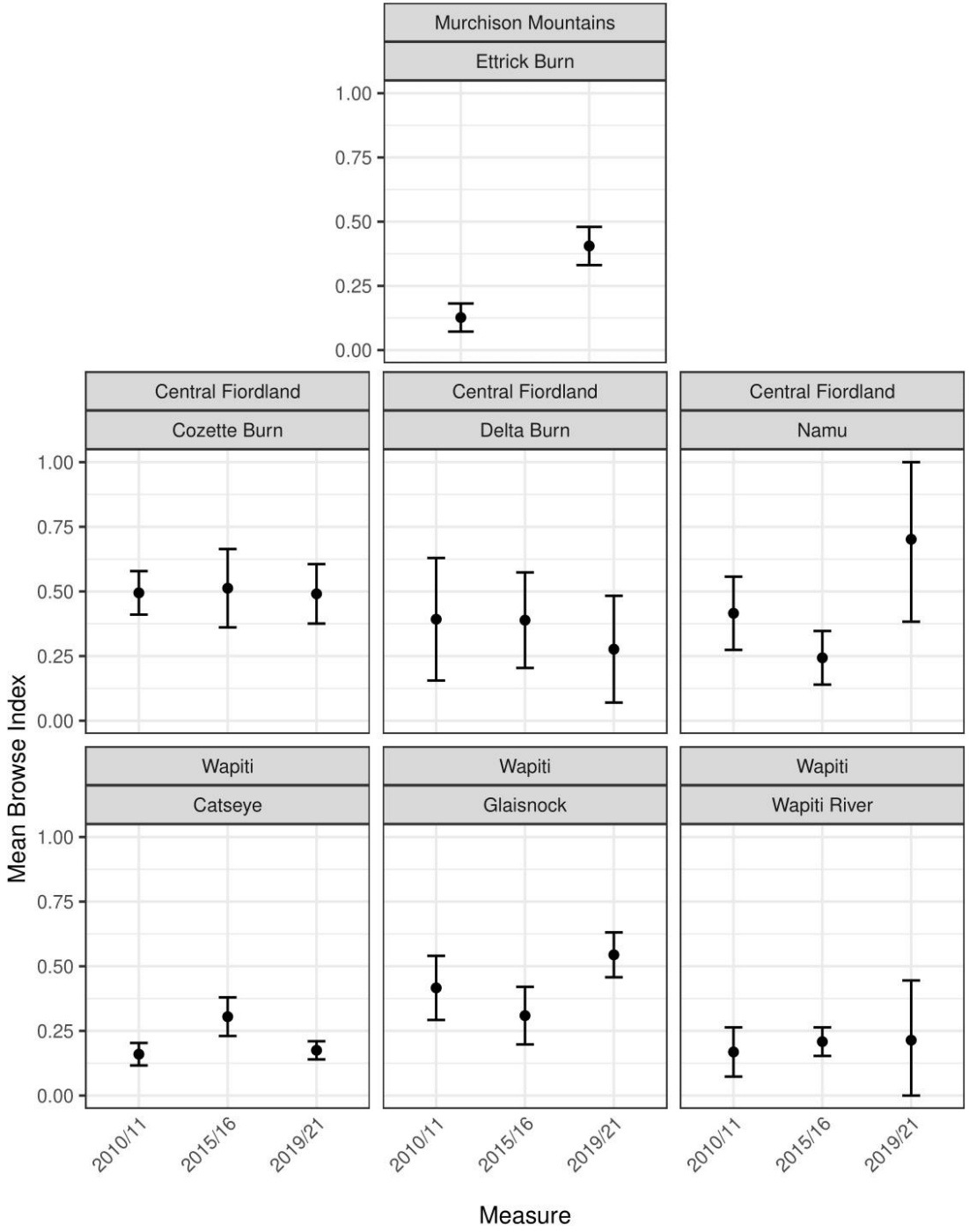
Results

SRI by management unit through time



Results

SRI and Browse by catchment, within management unit, through time



Summary for the Wapiti Area

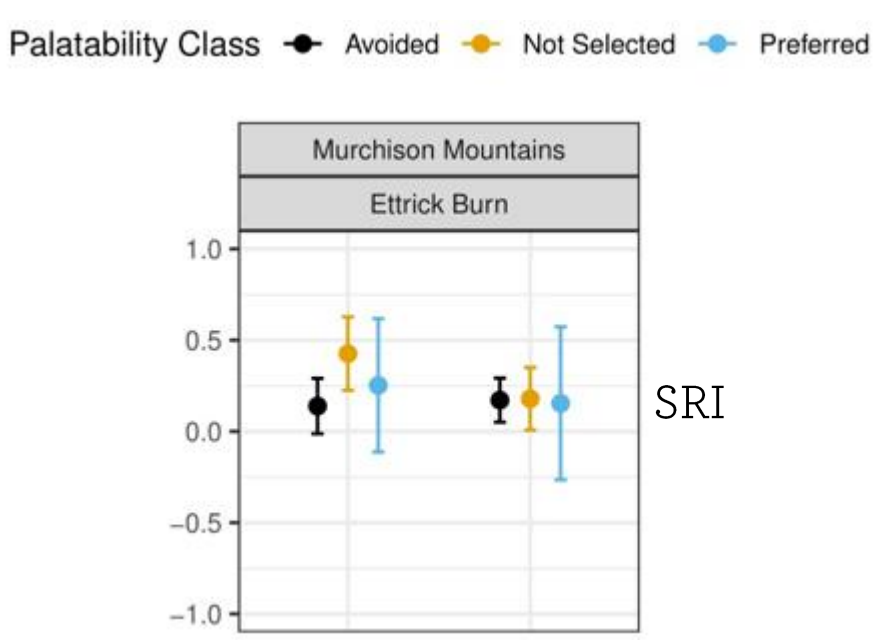
- We would like mean browse across all spp. to be maintained @ ≤ 10%
- We should aim for 1100 deer PA, mostly from the tops to try and achieve this
- Browse and SRI values vary by catchment – a target SRI for deer preferred species of 0.25 seems reasonable, this is being achieved in the Wapiti River catchment
- To achieve this, will require more deer control below the bush line in many catchments within the Wapiti Area

Murchies Forest

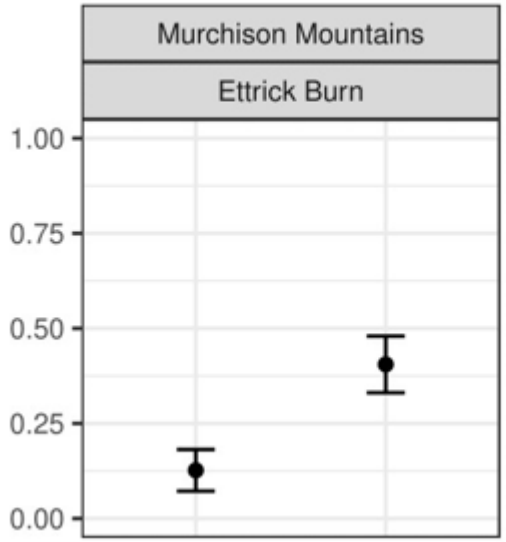
2011: 10.7% of plots had pellets

2019: 14.1 % of plots had pellets

2011 vs. 2019



SRI



Browse

Limitation of current monitoring

- The methods have served their purpose. They have given us an insight into forest and alpine impacts and their interplay with management and deer abundance.

However,

- Alpine browse gives us abundance size, class and browse data for sensitive plant species, within deer preferred locations, but cannot tell us about wider alpine structure and composition

- SRI is only in three catchments – it can only tell us a story about those areas and the sample is not representative of the whole Wapiti Area and cannot provide inference across the entire Wapiti Area. It provides limited information on forest structural and compositional changes.