A person is seen from behind, skiing down a snowy mountain slope. They are wearing a red jacket and dark pants, and are using ski poles. The background features a large, snow-covered mountain peak and a dense forest of evergreen trees. The sky is blue with some clouds.

The Ecology and Distribution of Steelhead in the Eel River

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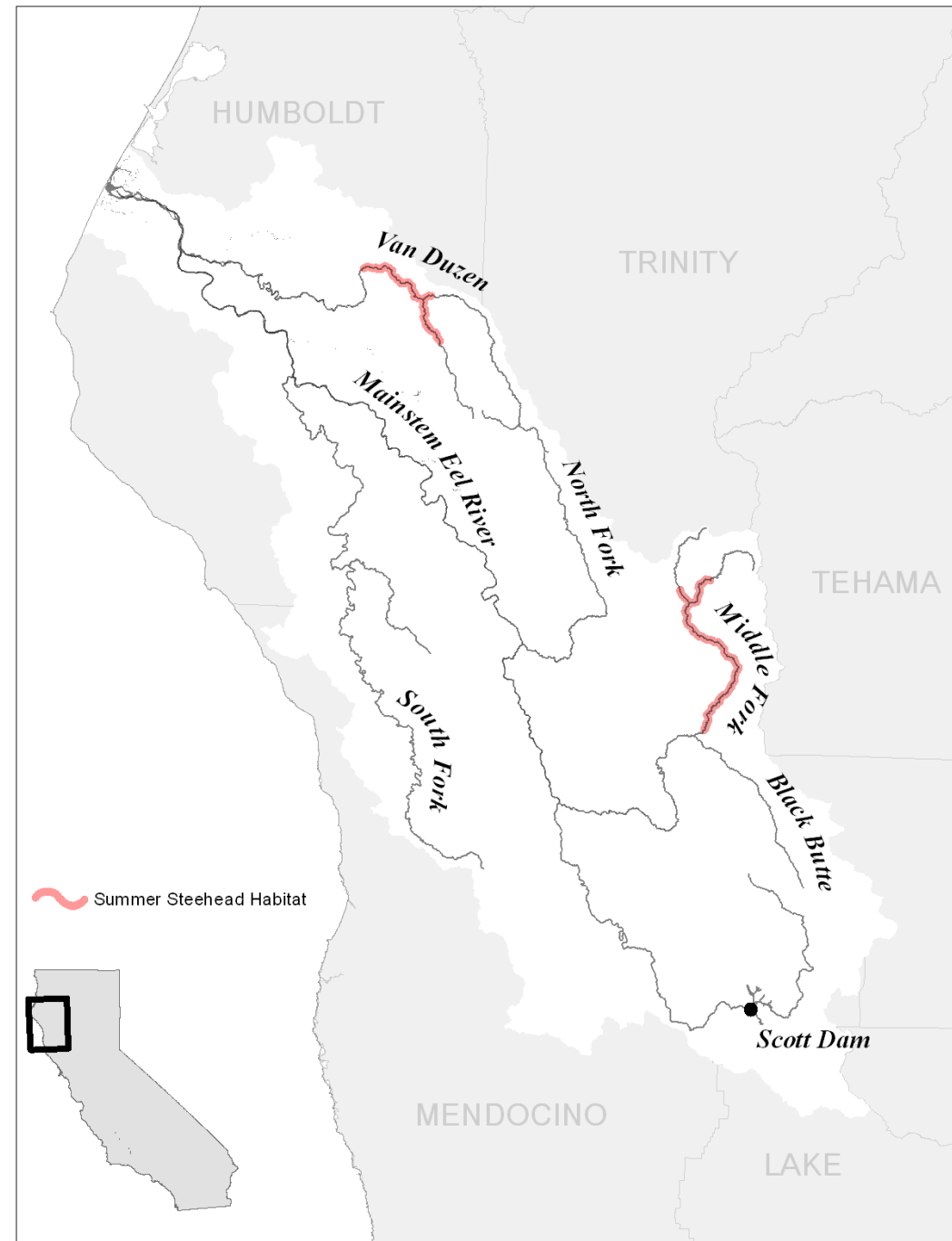
The Van Duzen River has a small remnant run of summer steelhead.

In California there are
two distinct runs of
steelhead, winter and
summer.



Summer steelhead in the Middle Fork Eel

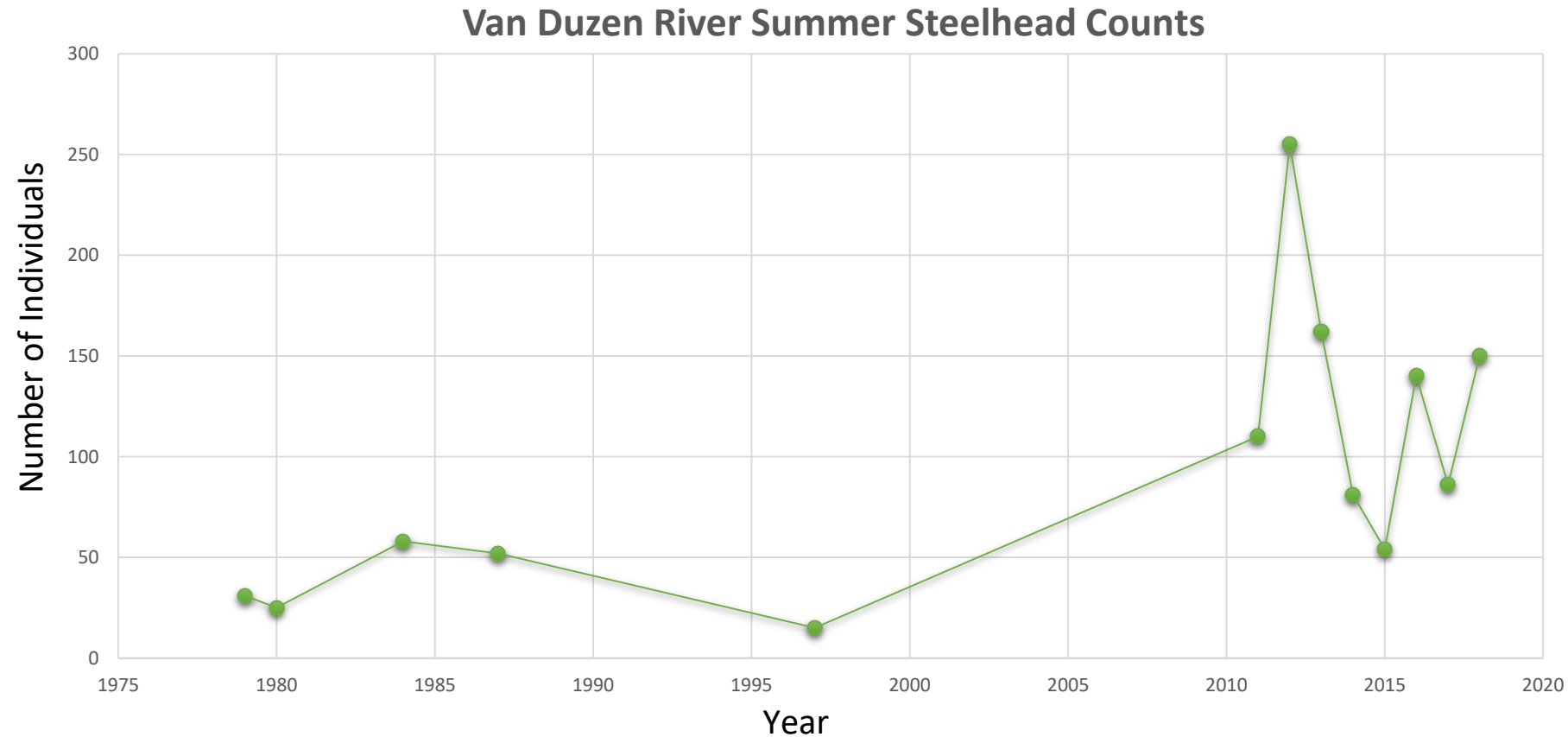
The Eel River is currently the southernmost extent of summer steelhead in California.



The Eel River is extremely erosive and characterized by many large, complex stretches of “roughs”.



Historic Counts of summer steelhead in the Van Duzen averaged an order of magnitude lower than what we have observed.





Many questions have remained unanswered regarding current and historic distribution of steelhead in the Eel River.

- Are Van Duzen summer steelhead an independent population?
- Is Eaton Falls a complete barrier to anadromy?
- Do summer and winter-run fish spawn and rear in different locations?
- Would the resident trout population above Scott Dam be a good restoration source if the dam were to be removed?

Dip-netting proved to be the most effective method to obtain sufficient samples.

Basin	Number of Sites	Total number of samples
Van Duzen	29	480
Middle Fork	13	183
Upper Eel	8	173

Total = 836

- High spatial distribution
- Young of the year sampling
- 2 years of sampling



Genetic analyses provide useful tools for addressing ecological questions.

- Laboratory preparation
- Rapture
- Overall differentiation, OMY5 and GREB1L

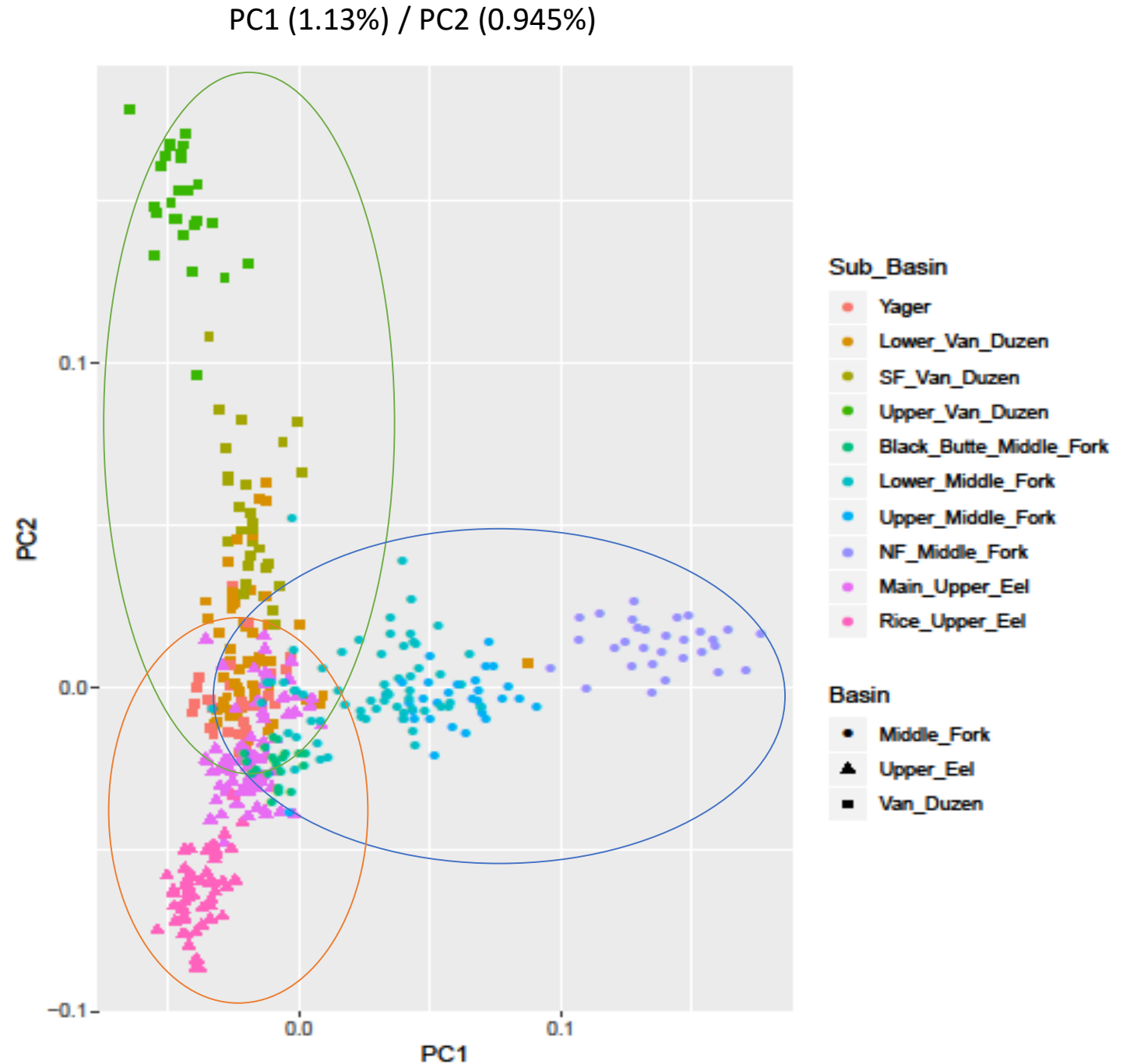


Summer steelhead in the Van Duzen

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Van Duzen summer steelhead are an independent population, not strays from the Middle Fork Eel.



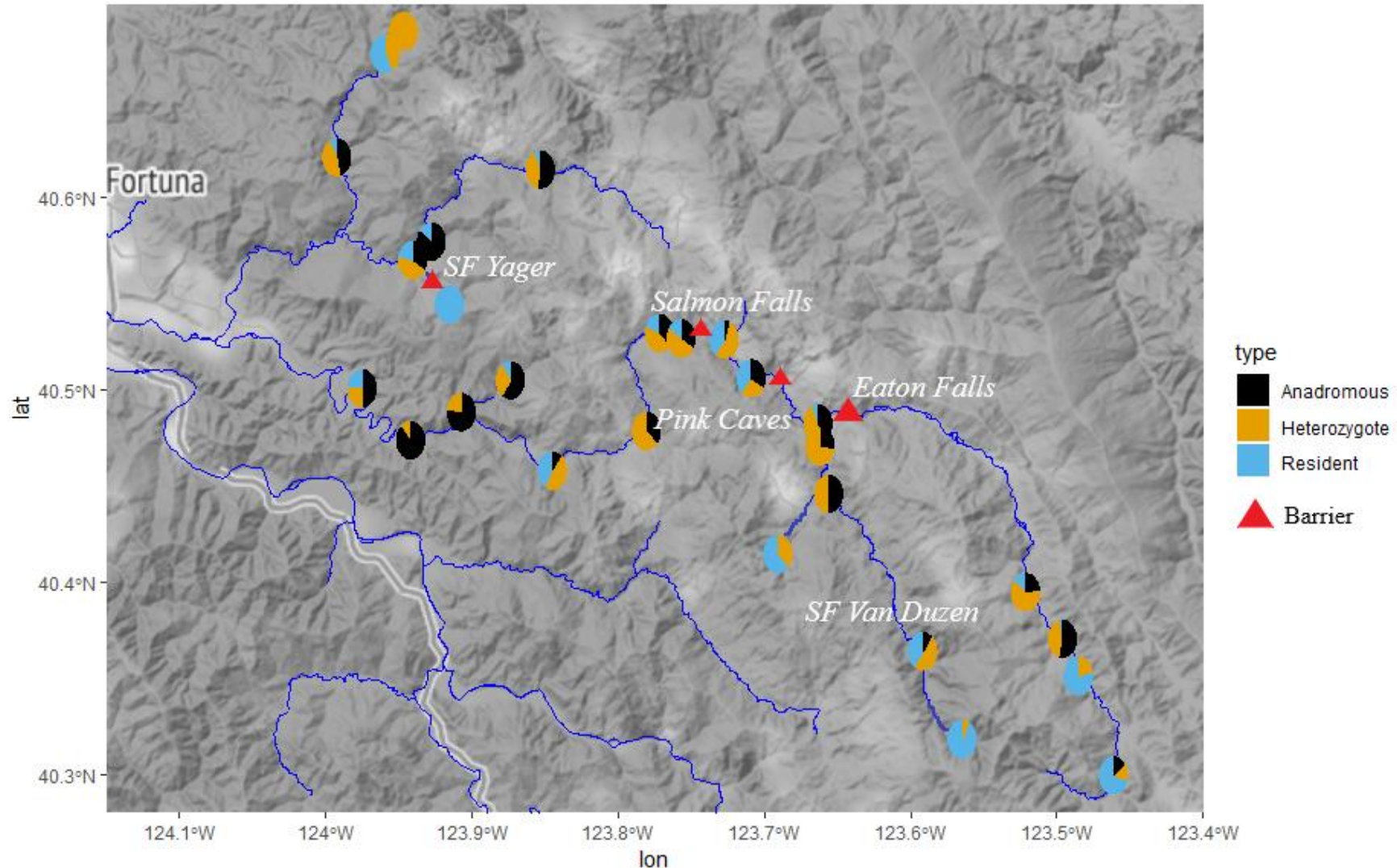


Eaton Falls

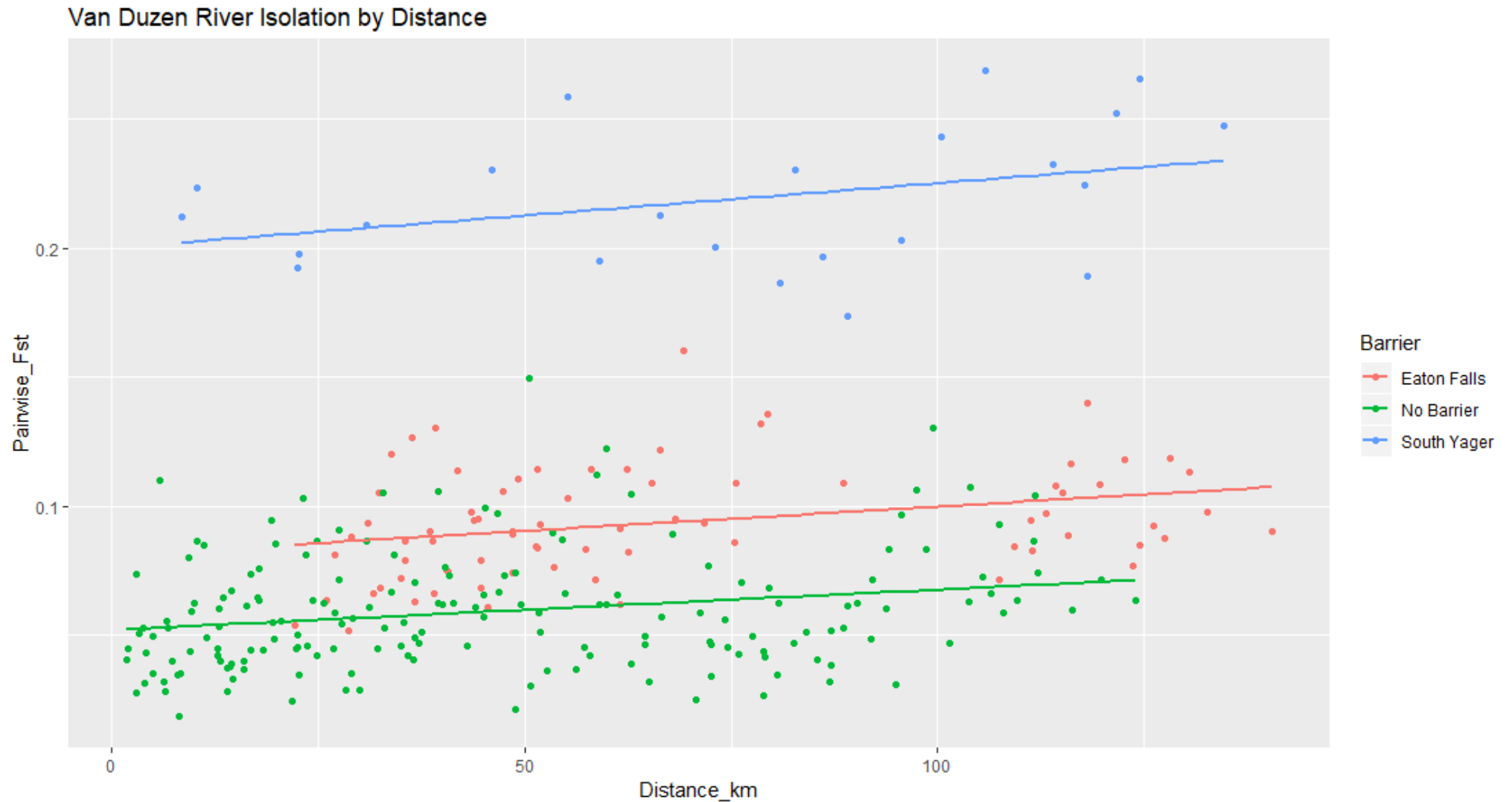
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There is a high frequency of the anadromous genotype above Eaton Falls.



Eaton Falls is not a complete barrier to anadromy.



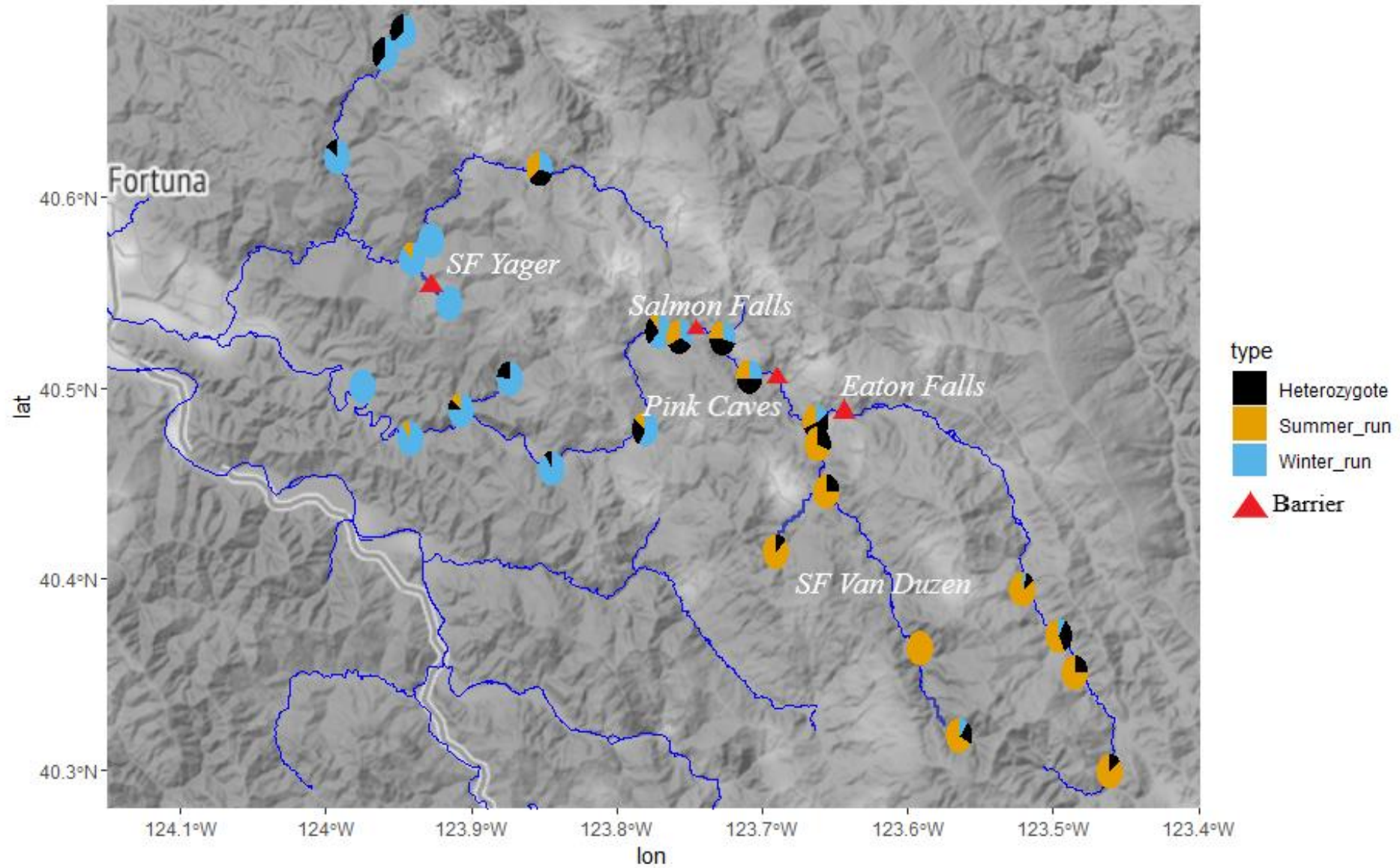


Pink Caves

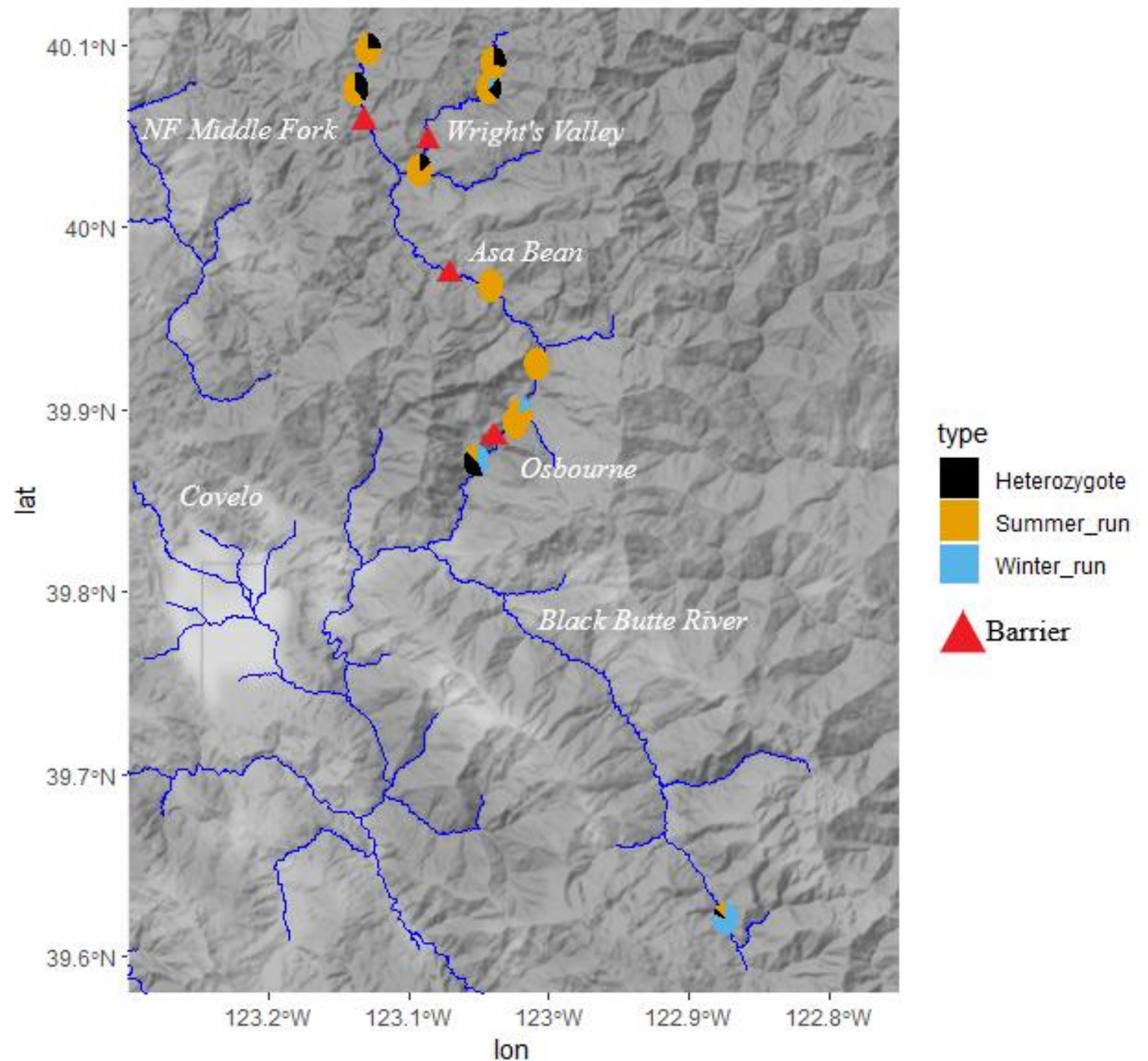
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We observe distinct spatial segregation around the three major Lost Duzen barriers at the GREB1L locus.



We observe similar spatial segregation of summer and winter-run steelhead around barriers in the Middle Fork.



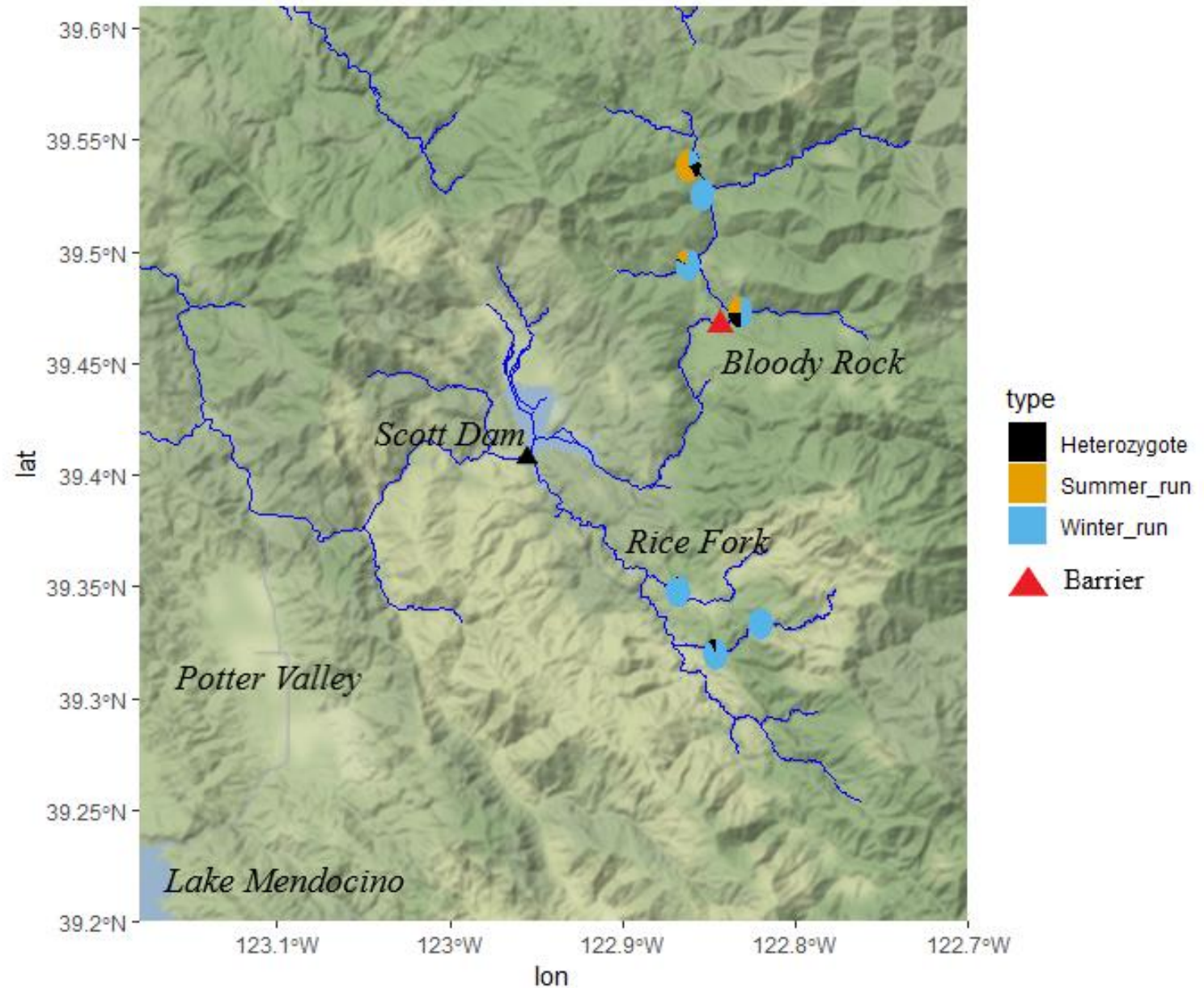


Upper Eel above Scott Dam

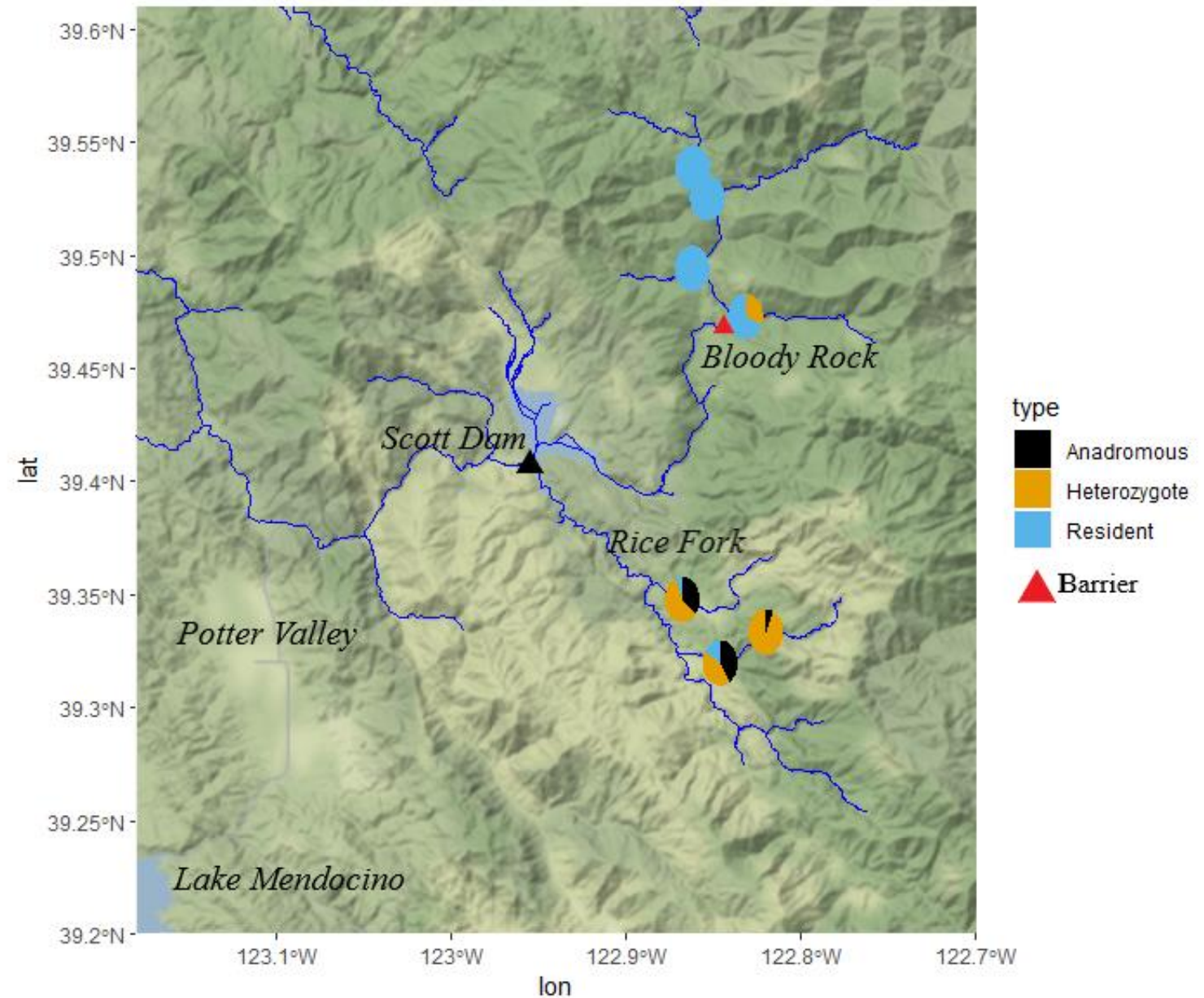
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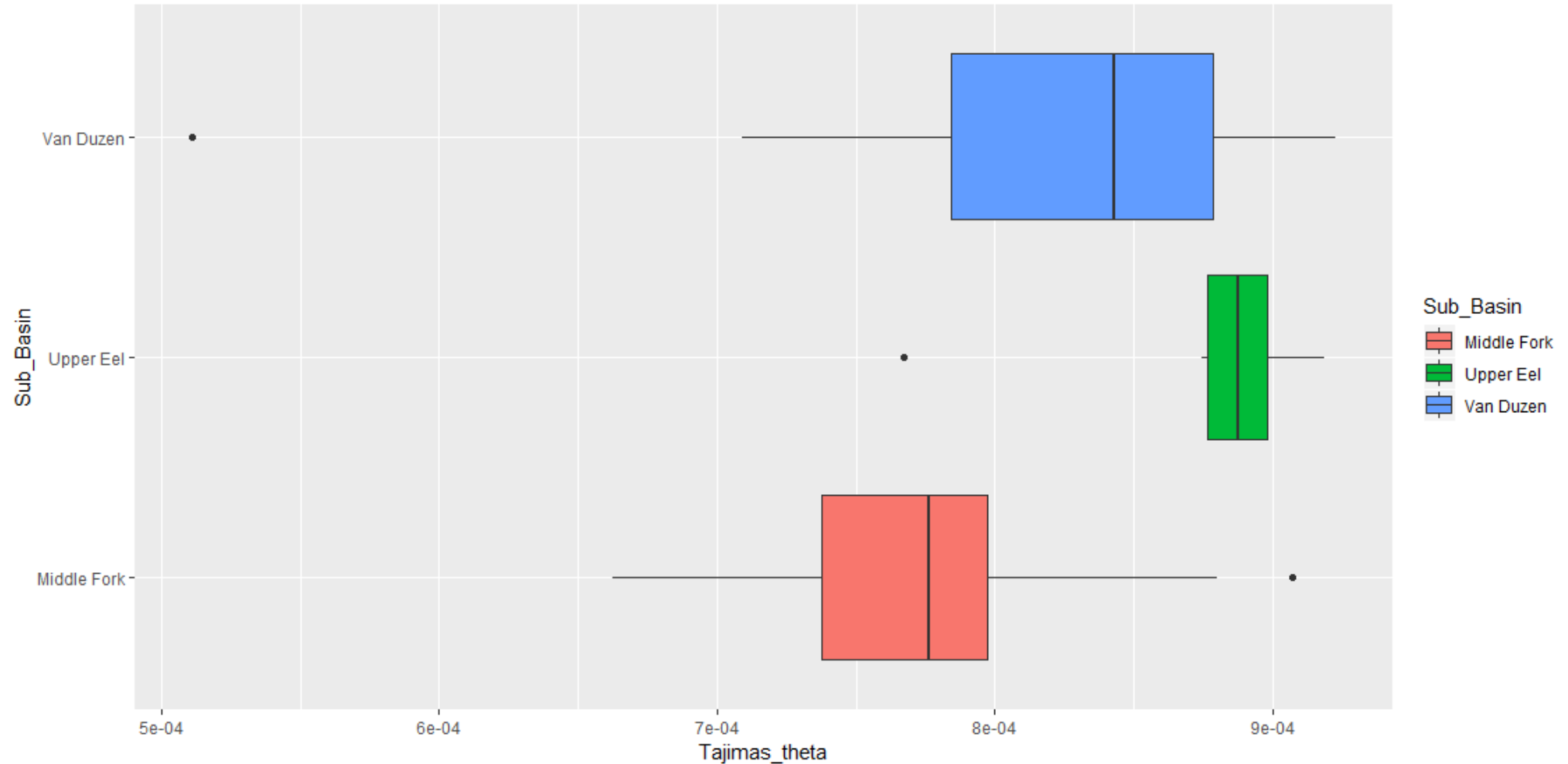
The summer-run allele is present in the resident trout population above Scott Dam.



Life history
diversity is being
maintained in
the resident
population above
the dam.



Overall genetic diversity is being maintained in the resident population above the dam.



Conclusions

- Van Duzen River summer steelhead are an independent population
- Anadromous fish are passing Eaton Falls with some regularity
- Summer and winter-run steelhead are reproductively isolated by distinct geographic barriers
- Summer-run steelhead inhabited the Upper Eel above Scott Dam prior to dam construction
- Genetic diversity is being maintained in the resident population above the dam



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