

# Smith River: Macroinvertebrate Study

## 2016-2024

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### Introduction

MBS began the Smith River (SMR) Benthic Macroinvertebrate (BMI) Monitoring program in 2016 and has continued this into 2024. BMI monitoring has been performed at 8 SMR stream reaches with prior data (MDEQ 2005), but up to 10 sites have been monitored (Map 1). With support from UMOWA, Jerry Metcalf Foundation and Sandfire Resources, 2 sites (SMR u/s and d/s of Sheep) have 9 yrs of data.

### Monitoring Sites Sampled 1999, 2016-2024

**Crayfish have marched up the Smith River to Ft. Logan since 1999.**

**HOE Algae-Cladophora 2017**

**Camp Baker Algae -Cladophora 2020**

**SMR D/S Sheep Algae 2023**

**USGS site 2024**

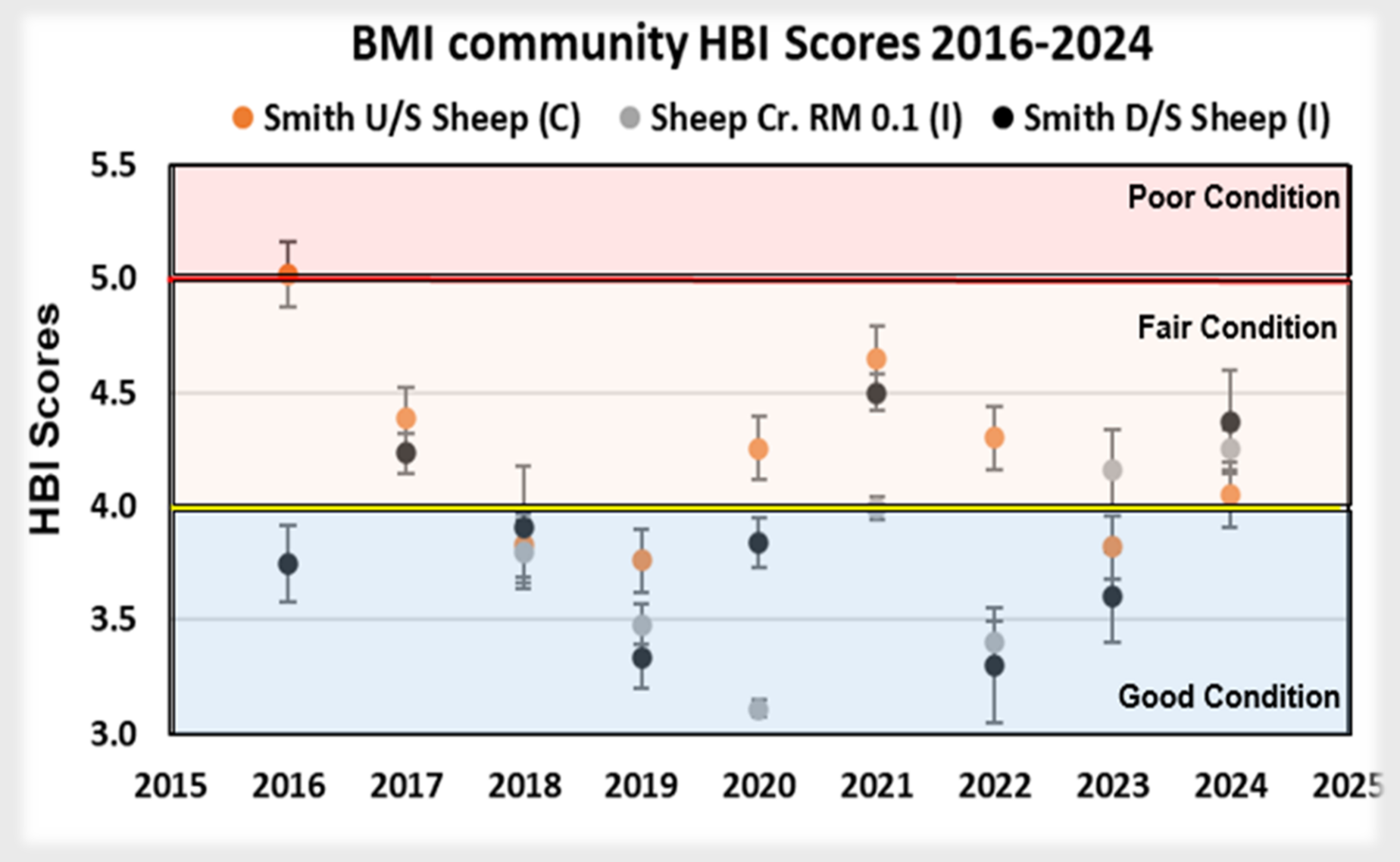
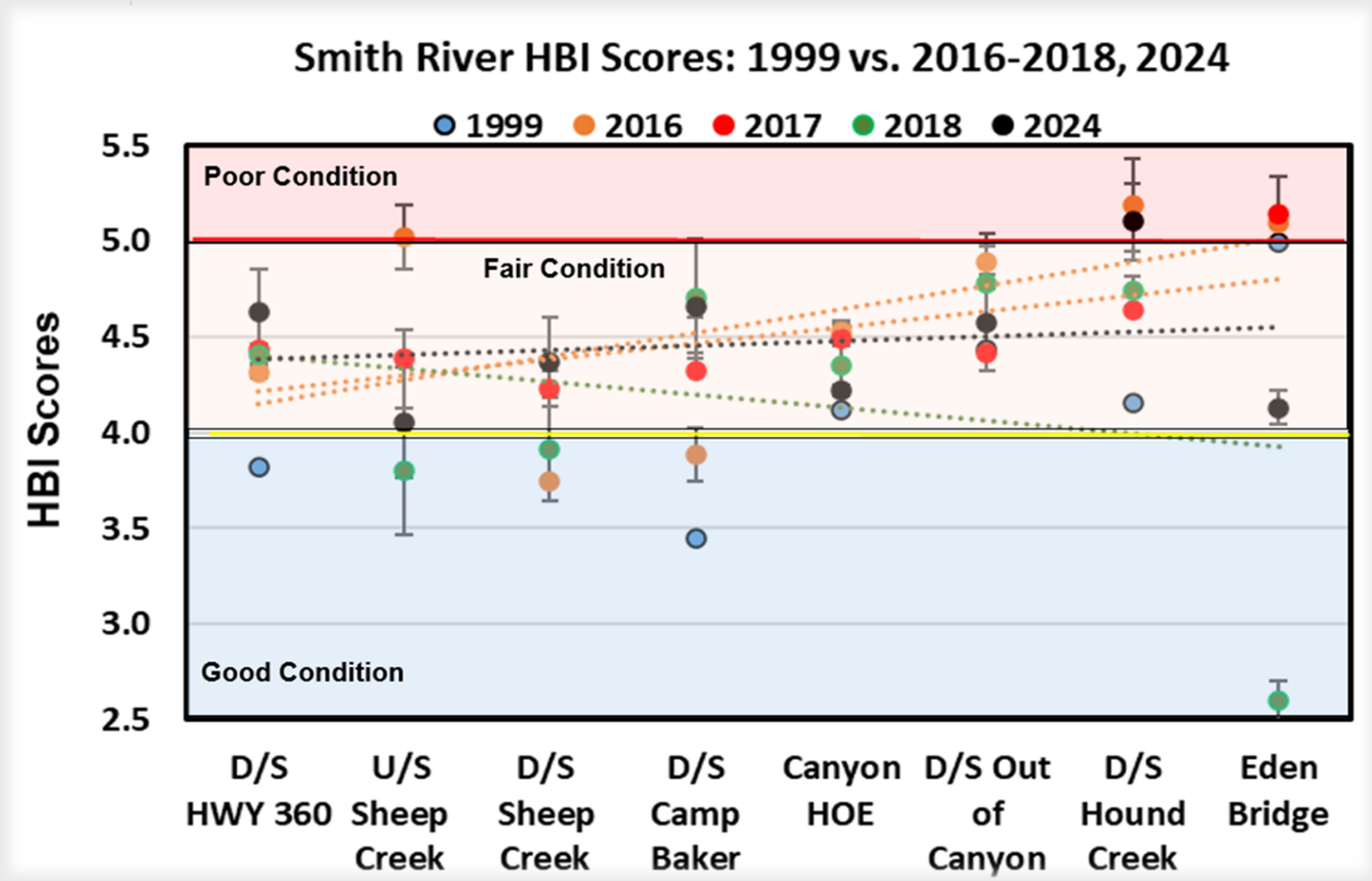
**D/S Tenderfoot 2024**

**Salmonflies are still persisting in the Smith River downstream of Sheep Creek and throughout the canyon**

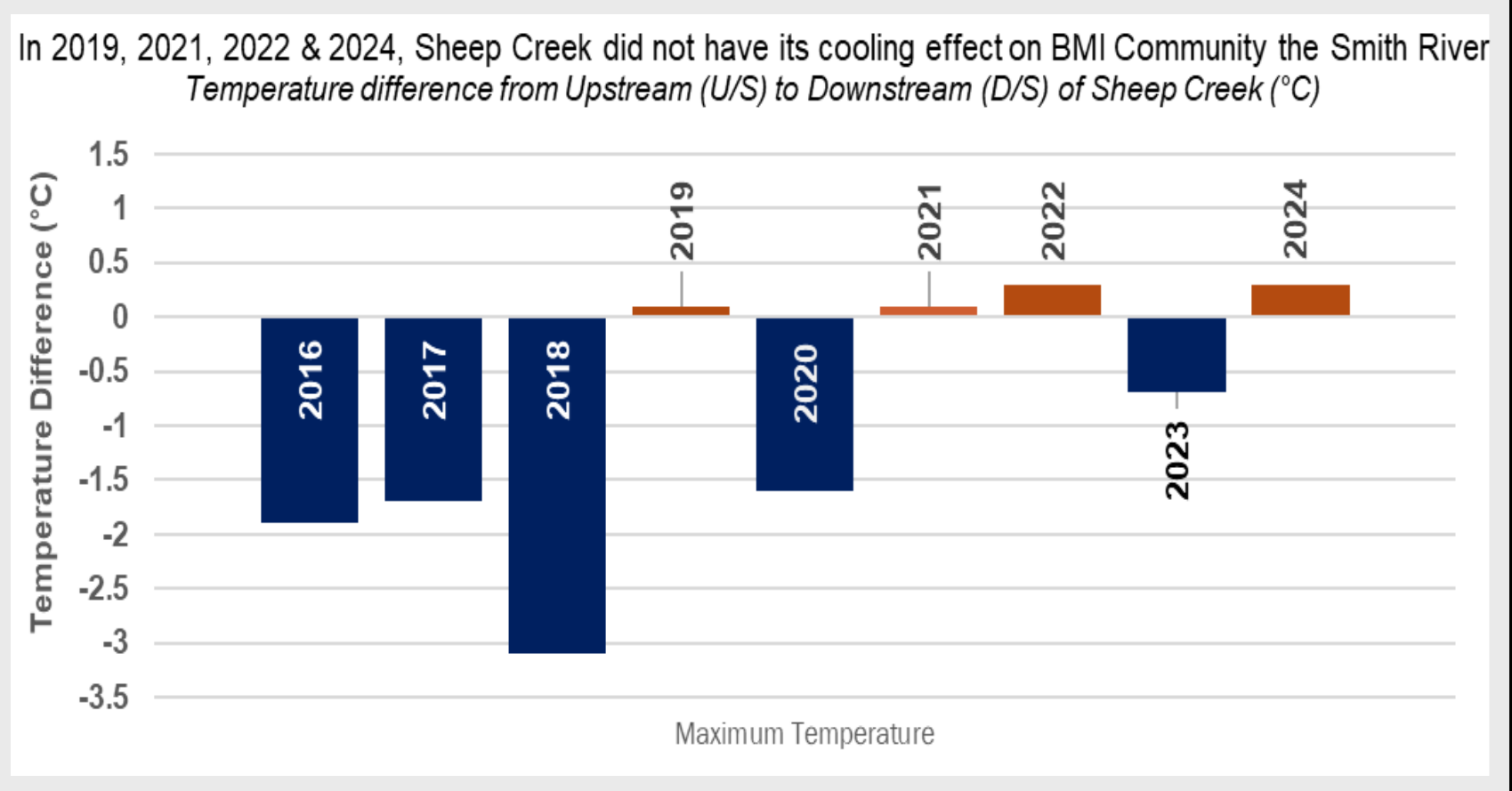
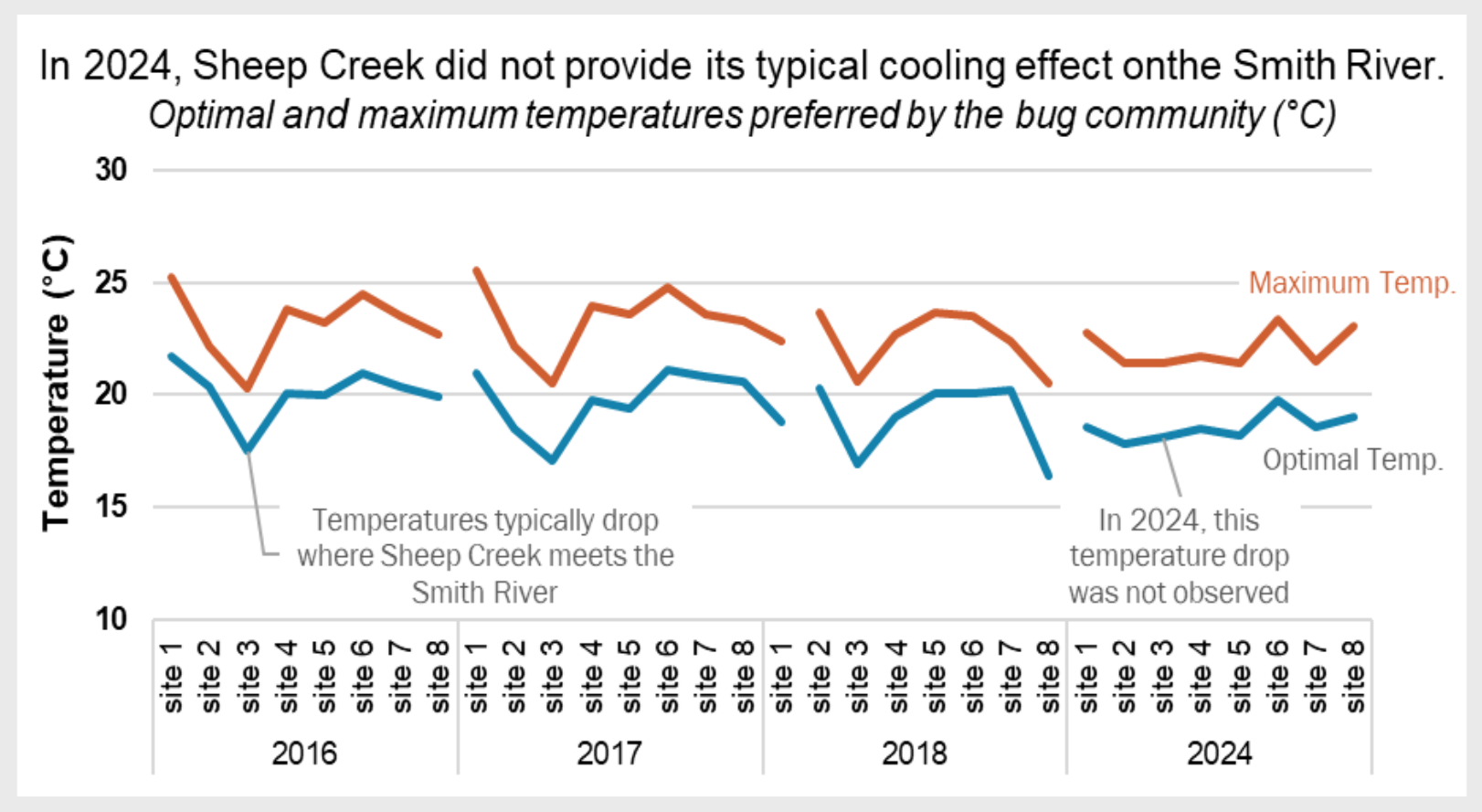
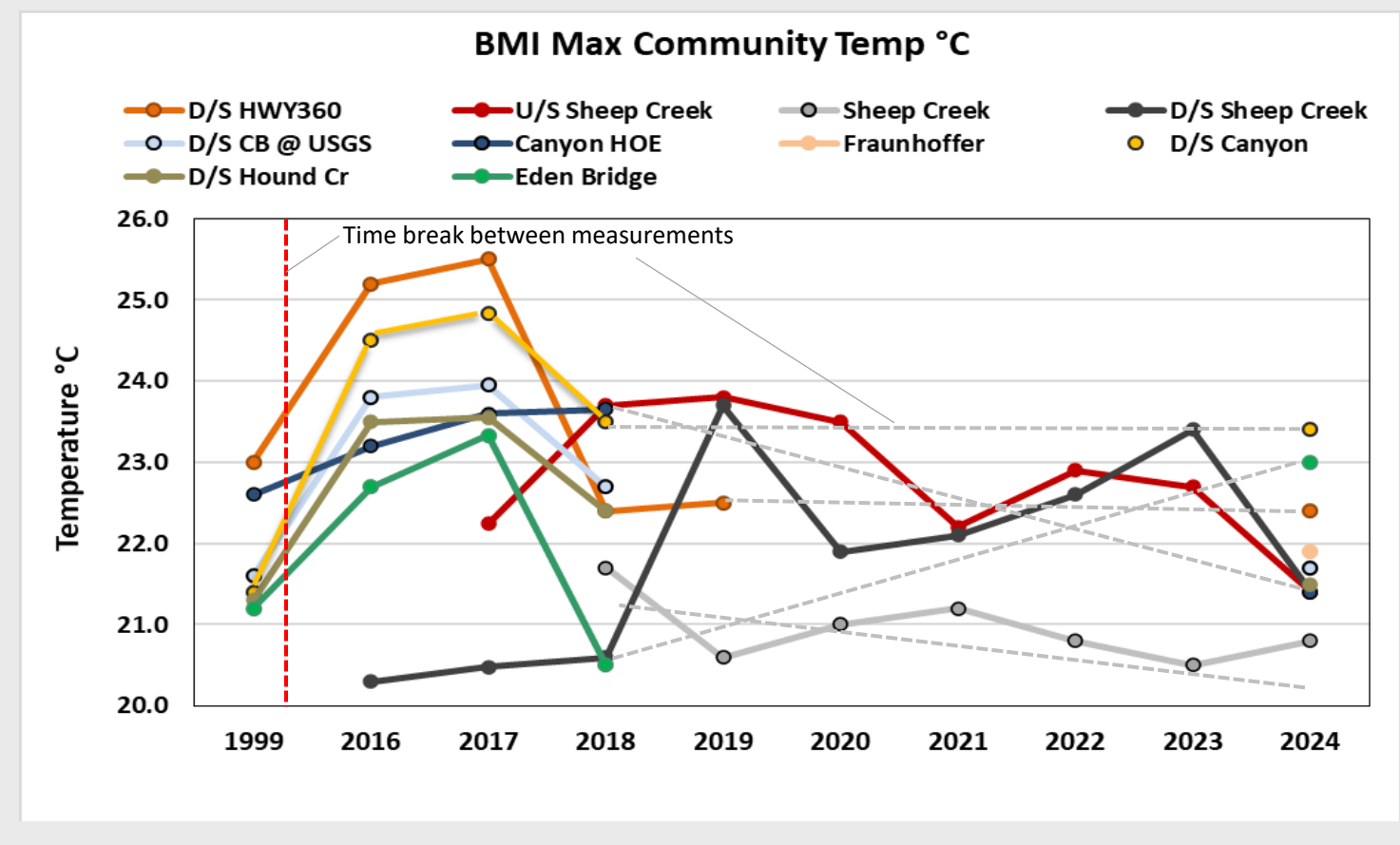
Map 1. Smith River stations sampled in 1999 and 2016-2024

### Macroinvertebrate Integrity & Temperature Responses

1. BMI HBI Scores were significantly better (lower) in 1999 at 4 SMR sites (a); trends across most years are worsening as you leave the canyon except in high flow years (2018). Conditions for the SMR sites near Sheep Creek have improved in 2018 into the good condition for 2 years and then 2021 drought brought them into the Fair Condition (b). High flows help SMR BMI communities, but even Sheep Creek has been rated as 'Fair Condition' lately.



2. How the BMI community's tolerance 'responds/reacts to'  $\Delta$  in water temperatures (for reference, Westslope Cutthroat maximum temp tolerance is  $\sim 23^{\circ}\text{C}$  and Brown Trout closer to  $27^{\circ}\text{C}$ ), sometimes with a lag time---2016 and 2017 were the warmest conditions ever reported at some sites (probably spillover from 2015 warm temps). BMI temperature tolerances decreasing with the last couple years of higher flows/cooler water.



### Conclusions & Trends

- BMI biointegrity across Smith River sites has been on a decreasing trend since the late-1990's; higher flow years tend to increase the health of the BMI community. While BMI community temperatures were on an increasing trend in 2016-2018.
- Sheep Creek BMI community health decreased to the 'Fair' Condition in 2023 and 2024, after being 'Good' from 2016-2022
- BMI communities in the Sheep Creek lower reach are experiencing these environmental stressors and temperature related impairments, though still remain cooler than the Smith.

