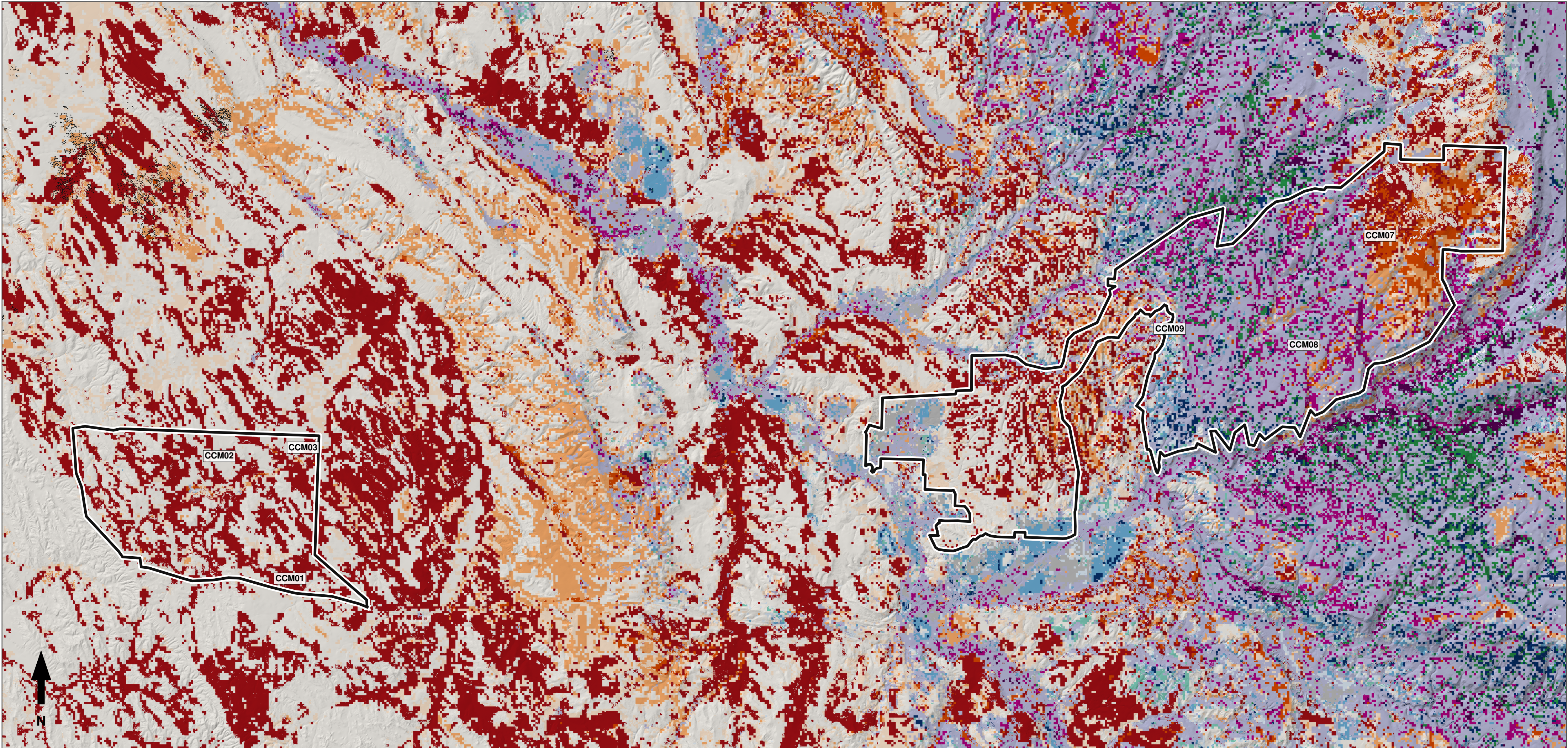


Sagebrush vs. Juniper Dynamics | Persistence, Expansion and Retreat, 2024–2026

10 m EMIT and EnMAP imaging spectroscopy, GEDI/CHM canopy structure and HLS multispectral reflectance · Carter Country Meats Ranch, Ten Sleep, Wyoming · Seasons in order: autumn2024 (1 scene), summer2025 (2 scenes), spring2026 (4 scenes), summer2026 (5 scenes)



1 · Neither present at any season 30.8%	5 · Sagebrush intermittent 11.2%	9 · Conifer intermittent 1.6%	13 · Mixed, other transitions 20.5%
2 · Sagebrush persistent (every season) 1.9%	6 · Conifer persistent (every season) 1.2%	10 · Mixed persistent (both every season) 0.8%	14 · Not rangeland (crops, water, built land) 0.7%
3 · Sagebrush expanding (absent to present) 5.4%	7 · Conifer expanding (absent to present) 1.6%	11 · Conifer encroaching into persistent sagebrush 3.3%	
4 · Sagebrush retreating (present to absent) 19.1%	8 · Conifer retreating (present to absent) 0.5%	12 · Sagebrush recovering under persistent conifer 1.5%	

Presence = cover of at least 5 % in a season; a cell is classified where at least three of the four seasons observed it. Sagebrush = *Artemisia* *Tridentata*; conifer = juniper + pinyon/ponderosa + other conifer. Autumn 2024 rests on one October scene. Dotted outline: seam between The June 2026 swaths, filled from the 2026 annual composite (9 scenes). Gray: not rangeland. White: no data. Basemap: hillshade derived From the USGS 3D Elevation Program (3DEP) 1/3 arc-second DEM (U.S. Geological Survey, <https://www.usgs.gov/3d-elevation-program>).