

LANDSCAPE CHARACTERISTICS AND HIGH STREAM NITROGEN IN THE OREGON

COAST RANGE: RED ALDER COMPLICATES USE OF NUTRIENT CRITERIA

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Stream nitrogen concentrations are variable and often high in the Oregon Coast Range, uncharacteristic for a predominantly forested region. We compiled stream nitrogen data and GIS-derived landscape characteristics in order to examine variation in nitrogen across the region. In simple linear regressions, basal area of N-fixing alder trees, expressed as a percent of watershed area, accounted for 37% and 38% of the variation in summer nitrate and total nitrogen concentrations, respectively. Relationships between alder and nitrate were strongest in winter when streamflow and landscape connectivity are highest. In multiple linear regressions, nitrate concentrations were positively related to distance to the coast and latitude (potential surrogates for sea salt inputs), and to watershed area. The model with the lowest AIC did not include developed or agricultural land cover, since few watersheds in our database had substantial levels of these land cover classes. Our results provide evidence that background sources

and processes cause many Coast Range streams to exceed proposed nutrient criteria, and that the prevalence of a single N-fixing species exerts a dominant control over stream N concentrations across this region.