Abstract: Landscape features can significantly influence genetic and life history diversity of rainbow/steelhead trout, O. mykiss. In this study, heterozygosity of 21 populations of O. mykiss from the Pacific Northwest, USA was significantly negatively correlated with features such as elevation ($P = 0.0023$), upstream distance ($P = 0.0129$), and precipitation ($P = 0.0331$), and positively correlated with temperature ($P = 0.0123$). Mantel tests of isolation by distance were significant for anadromous populations ($P = 0.007$) but not for resident collections ($P = 0.061$), and suggested that fluvial distance was not the only significant physical parameter that influenced genetic structure of life history types. Principal components interpolated to the drainage indicated that high elevation sites were primarily occupied by the resident life history and high gradients and barriers act to limit anadromous distribution to lower elevation sites. These patterns of O. mykiss life history diversity provide insight regarding the interaction, distribution, and limitations of resident and anadromous forms of the species within this region.