The spatial ecology of adfluvial bull trout in a large hydropower reservoir

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There are a variety of reasons why fish change their spatial position, for instance fish may move to forage, reproduce, evade predation, defend territories, thermoregulate, and explore. Knowing how fish move in their environment can help test theory, inform fisheries management, and improve the understanding of species of conservation concern. However, characterizing the movement of free-swimming fish is logistically challenging, particularly when posing questions about seasonal migrations for species that are capable of large movements. Bull trout (*Salvelinus confluentus*) is a North American charr that can have a pelagic-wandering and migratory life history. In addition, bull trout are relatively poorly understood compared with congenerics, threatened by hydropower entrainment, sensitive to environmental change, and of conservation concern across much of its range. Given the conservation status of bull trout and knowledge gaps about bull trout ecology, we used acoustic biotelemetry to help characterize movement in the pelagic life history form of this species over an entire year, including beneath ice. We found that the extent of bull trout movement and homerange size was dependent on season and body size. Bull trout also exhibited clustered centers of activity. The results are discussed in the context of entrainment vulnerability, fisheries management, and bull trout ecology.