

## **Stream Habitat Restoration Opportunities Through Reclamation of Instream Gravel Mines in Western North America: Examples**

Janine Castro<sup>1</sup> and Brian Cluer<sup>2</sup>

Instream gravel mining includes various excavation methods within a stream's boundaries as well as pits located within the meander belt on floodplains. Instream mining and stream restoration are often perceived to be mutually exclusive; however, careful planning, design, and implementation of a reclamation plan can allow restoration activities to occur concurrently with gravel mining operations. Hence, retiring mining operations, or those phasing out, can create various types of physical habitat which will result in more rapid ecologic recovery after mining ceases, leaving a healthy stream as their legacy.

The greatest opportunities for habitat improvement through instream mine reclamation are associated with streams that are actively aggrading; where local accumulations of bed material represent opportunities to excavate aggregate while improving habitat values. This condition is sometimes found at tributary mouths and on alluvial fans. Streams with habitat qualities that have been reduced by prior engineering works and/or land use, or those not in approximate equilibrium, may be candidates for improvement through careful planning and implementation of excavations.

Examples of reclamation plans for instream gravel mining from California, Oregon, Washington, and Alaska sites include: (1) planning for the eventual incorporation of gravel pits as stream-side wetland features, (2) direct habitat creation through designed excavation such as pool/bar/riffle formation and side channel formation, (3) creation of temporary refugia habitats such as alcoves and pools, (4) habitat enhancing structural elements added to mining excavations, (5) creation of floodplain benches in incised or channelized streams, and (6) development of tidal marsh in an estuary system.

<sup>1</sup>U.S. Department of the Interior, Fish and Wildlife Service, Portland, OR

[Janine\\_castro@fws.gov](mailto:Janine_castro@fws.gov)

<sup>2</sup>U.S. Department of Commerce, NOAA Fisheries, Santa Rosa, CA