



# Hoosier National Forest Happenings



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## AQUATIC ORGANISM PASSAGE ON THE HOOSIER NATIONAL FOREST

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### What is an aquatic organism?

Aquatic organisms are organisms that spend either part or their entire life in water sources such as freshwater streams, rivers, and lakes. Examples of aquatic organisms include: fish, crayfish, mussels, and salamanders.

### Managing aquatic organism passage on the Hoosier

The goal is to maintain and improve aquatic biodiversity and habitat on the Hoosier National Forest. Since 2006, the Forest has conducted aquatic organism passage surveys of road crossings on selected Forest watersheds. The surveys determined which crossings (culverts and low water fords) were likely to be barriers to aquatic organism passage preventing or impeding the movement of aquatic organisms. Replacing impassable crossings with passable structures will prevent population fragmentation, allow for access to habitat, and recolonization after disturbance.

### How crossing structures can impede movement

There are a variety of ways crossing structures impede or prevent the movement of aquatic organisms.

- **Inlet or outlet drop** Elevation drops at the inlet or outlet or within a crossing structure can create physical barriers to many species. Not all stream-dwelling aquatic organisms have strong jumping capabilities ("**structure blocking**" jpeg)
- **Physical barriers** Clogged or collapsed culverts and trash racks can block movement
- **Excessive water velocities** Water velocities can be too high to pass fish or other organisms. As stream-discharge increases, velocities within culverts increase requiring the organism to swim the entire length of the structure at burst speeds which may cause exhaustion before reaching the end of the culvert

- **Excessive turbulence** When a culvert creates more turbulence than the natural channel, the aeration (bubbles) and chaotic flow can disorient aquatic species, inhibit their swimming ability, and block passage
- **Breaks in streambed material** Crossing structures that lack any natural streambed material or contain artificial material that contrasts with the natural stream channel create breaks in streambed habitat. Streambed material in a culvert allows the organism to pass upstream without using excessive amounts of energy.

For additional information on aquatic organism passage, contact Amanda Kunzmann at 812-547-7051, [akunzmann@fs.fed.us](mailto:akunzmann@fs.fed.us).



Road structure blocking aquatic organism passage



Structure blocking aquatic organism passage



Structure designed for aquatic organism passage