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We should better understand how to live with floods

While most residents were anxiously eying raging rivers, ecologists and conservation biologists were wading into them, sampling streams and scouting riparian habitat to see how they fared in the floods. Native species have evolved to depend on periodic pulses of high water like the ones that have beset California. **Marcio Jose Sanchez** The Associated Press

BY JANE BRAXTON LITTLE

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Floods are like wildfires: Both are natural forces that can unleash devastating power, destroying homes, damaging human infrastructure and forcing emergency evacuations.

Scientists call wildfires and hellishly high waters "disturbance events," a term that dramatically understates the effects on humans but describes the role of these keystone ecological processes in the biological landscape. Like natural fire, periodic flooding has shaped ecosystems, rejuvenating habitats and nurturing species that are dependent on them for survival.

As state officials prepare to spend $437 million to help fix California's aging flood-control systems, they should be thinking about how to protect people in ways that enhance natural systems developed over millennia.

Late last month, while most residents were anxiously eying raging rivers, ecologists and conservation biologists were wading into them, sampling streams and scouting riparian habitat to see how they fared in the floods. Native species have evolved to depend on periodic pulses of high water like the ones that have beset California. Insects and fish, birds and mammals rely on floods for the renewal that cleanses and reshapes their habitat.

Fish are the most obvious beneficiaries. On Butte Creek, a tributary to the Sacramento River that supports California's largest population of federally threatened spring-run salmon, Greg Golet found water spreading out from the stream channel onto adjacent floodplains. That is allowing fish to move into backwaters and oxbows where they can hide from predators.

By connecting the channel with the floodplain, high waters are also moving nutrients and sediments into streams. Redistributing and depositing sediment in river bottoms provides gravel perfect for young fish, said Golet, an ecologist with The Nature Conservancy. Along with places for them to hide, fresh sediment harbors aquatic invertebrates for them to eat.

Like other native fish that have evolved with these periodic inundations, salmon know how to live through them, said Peter Moyle, a fish and conservation

biologist with UC Davis. Continued high flows will favor native species, which are especially good at finding their way into floodplains and sheltered areas, he said. Non-native fish such as bluegill and fathead minnow are more likely to be swept downstream.

Flood-swollen streams are also a boon to birds. On his scouting trip, Golet found the erosion that is eating away at man-made levees has created vertical cut banks along Butte Creek. That's a break for the bank swallow, a colony nester considered threatened in California. This fist-sized bird uses river banks and bluffs to burrow deep into the sandy soil. The recent high flows scoured their nest burrows, washing away the old ones infested with the parasites that infect their chicks, Golet said. When they return this spring they will find fresh banks for excavating new nests.

For the yellow-billed cuckoo, flooding nurtures cottonwoods and willows of various size and age along a 100-mile stretch of the Sacramento River between Red Bluff and Colusa. This is the only place in California with woody habitat large and complex enough to support multiple pairs of this bird, whose song is often a harbinger of rain.

With wildlife burgeoning in these high waters, the challenge for human society is learning how to live with floods, especially when scientists are predicting an escalation in disturbance events. Recreating floodplains can help: They reduce the energy of rampaging streams, allowing the water to spread out and settle down instead of ripping out dams and levees. Giving rivers the room to accommodate floods is one way to protect communities.

As we begin to appreciate the ecological benefits of fire, we should also better understand how to live with floods. Try as we might – and have – it's unlikely we will ever control either one.

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