7 Crowding the Suburban Floodplain

At Eagle Island, developers build castles on sand.

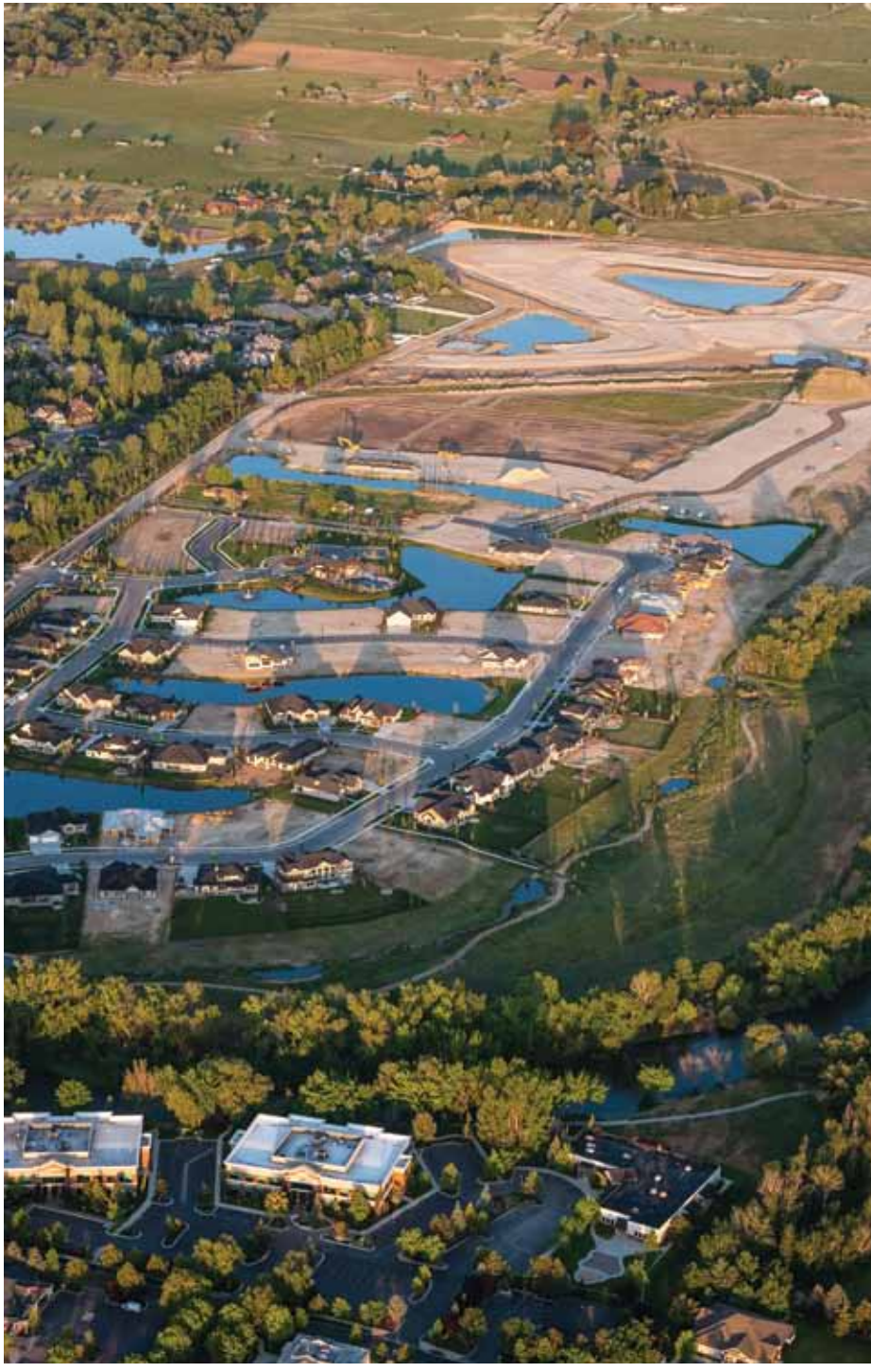
by Emily Berg

In the 1940s, at Eagle Island 8 miles west of the Idaho Statehouse, the Boise River looped and wandered through a corridor of flood-swept marshland more than 1.5 miles wide. Today, there are subdivisions with levees that narrow the channel to the width of a four-lane road. Almost every new house near the river changes the pattern and risk of flooding. Paving the marsh for housing makes life near the Boise River more hazardous than ever before.

Historically prone to flooding, the future Eagle townsite remained mostly farmland and pasture before the era of the automobile. By 1910, canals and an electric streetcar spread housing west of Boise. In 1938, the State of Idaho founded an Eagle Island trout hatchery. The city's population topped 20,000 in 2012. "Developments are the story around here," Meg Carlson, long-time resident of Eagle Island, said. "Every year we have developers come in and offer to buy our property." As builders slate new developments in the floodplain (the flat area of land bordering the river), the risk of flooding is cumulatively increased both upstream and downstream. The increased risk of flooding has had little effect on land use decisions along the Boise River at Eagle Island, however, and developments continue to invade the floodplain.

One such development is Mace River Ranch. Polete Mace, one of the original founders of Eagle, settled at Eagle Island in 1887. In December 2012, the Mace family sold their 192-acre property to Gardner Company, which plans to build a new residential community, the Mace River Ranch on Mace Road. Set to house 218 home sites next to the Boise River, Mace River Ranch is just the next in the line of residential developments at Eagle Island.

Along with Polete Mace, many of Eagle's early pioneers gravitated to the natural island, known as Eagle Island, on first arriving in the Boise Valley in the late 1870s. This low-lying gravel island, with groundwater only a few feet below, sits between a north and south channel created by a fork in the Boise River. Eagle Island is more than 5 miles long from the split of the north and south channels to their convergence and



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encompasses more than 3,000 acres. Annual flooding made the area lush and green. Cottonwood trees bordered both sides of the river, creating a natural wildlife refuge. Settlers thought it was the perfect place to start a prosperous farming operation to feed the growing population of Boise. Yet, because of the groundwater and surface water interactions at the island, river water inundated residents' homes and property every year. Cattle rancher T.C. Caitlin kept a boat moored to his porch to row to his barn when the floods came.

BOISE RIVER MAINTENANCE

Head of Eagle Island

Within the past century, the lower Boise River downstream of Lucky Peak Dam, including the Eagle Island area, has been transformed from a meandering, braided, gravel-bed river to a channelized, regulated urban river that provides numerous benefits to the community but also poses some challenges. Perhaps nowhere on the Boise River has channelization been more dramatic than at Eagle Island, where the developments and commercial activities have altered the floodplain significantly. Whereas in the 1800s, the river was sometimes as wide as 900 feet, by 2002 the river had been reduced to only 140 feet wide at the head of Eagle Island. The construction of the three federal dams upstream substantially reduced downstream flows and increased channelization, allowing for activities such as gravel extraction and residential development along the river.

Despite the fact that the Eagle Island area is a floodplain, the City of Eagle has designated future land use there as residential development pursuant to Eagle City Code. In her job as county engineer and floodplain administrator, Angie Gilman oversees applications for developments within the

floodplain. "That whole area is a floodplain. All the material underneath, all that property over there," Gilman said, pulling off the hood to her rain jacket and pointing out to the fields and subdivisions, "is nothing but sands and gravel just like you see here at the river bank." Building on rocky, permeable substrate such as that at Eagle Island can compact it and reduce its permeability. This, in turn, can hinder one of floodplain's most valuable functions: the ability to convey floodwaters. Channelization of the river, which increases river flow velocities, compounds the problem. Because of these factors, Eagle Island may be less able to withstand excess floodwaters, and flood damage may become more widespread.

In addition, the increased flow velocities can cause greater erosion and alter vegetation and fish habitat. Building in the floodplain inevitably alters that floodplain and changes the ecosystem of the river as well. This is not an effect that can be measured for each development, Gilman stated, but a cumulative effect that can't really be avoided unless development within the floodplain is prohibited entirely.

Allowing for the filtration of groundwater and surface water is one of the invaluable services that floodplains provide to ecosystems and communities. Infiltration improves surface water quality by removing nutrients and sediments. This process is inhibited by development on the floodplain, but water still flows through and can become a real problem when it comes to flood operations. Ellen Berggren, Boise project manager for the U.S. Army Corps of Engineers, said that the Eagle Island area can be inundated even during periods when the corps is releasing flows lower than flood stage from the three federal dams upstream. "At the Eagle Island area, they start having problems when the river reaches bankfull and even before. You have water running between houses and yards," Berggren asserted. "As a gravel bar with a high water table, even if the river isn't overflowing the banks and getting everywhere, the fact that the river is full means that the water table stays high and people have subwater and water in their backyards."

STEVE ZERZA

Flooding along the Boise Greenbelt

Eagle Island poses a real challenge for flood hazard mitigation for the Corps of Engineers and other floodplain administrators. Despite the risk of flooding, similar to the early settlers of Eagle Island, people today want to live next to the river and enjoy its beauty. There's a certain acceptance of risk among people who decide to build their homes at Eagle Island. Recurrent flooding is common, but there haven't been any catastrophic flood events or even substantial property damage to illustrate the real risk of living there. As further development is allowed on the floodplain, however, it will be increasingly difficult to manage floodwaters at Eagle Island and all along the Boise River. The flood hazard for the entire area adjacent to the river will continue to increase, and the degradation of the riparian ecosystem will escalate.

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Banbury subdivision in April 2006

Regulations on Building in the Floodplain

Federal, county, and city regulations govern floodplain development at Eagle Island. At the federal level, the Federal Emergency Management Agency's (FEMA's) National Flood Insurance Program has set standards based on its own flood hazard mapping. Ada County has initiated even stricter requirements than the FEMA standards. For example, although FEMA allows developments in the floodplain as long as the developers show that their building projects will not result in raising the base flood elevation, Ada County allows no development at all in the *floodway* (i.e., the part of the

floodplain that includes not only the channel where the current flows but also the area immediately adjacent to the channel that is susceptible to being inundated during flood events).

FEMA's purpose is disaster preparedness—their standards may keep houses from being swept away by a flood, but they don't allow for protection of floodplain functions or ecosystems. Regardless, FEMA maps are the basis for land use policy decisions in Ada County. Berggren said, "It is not necessarily good land policy. ... [FEMA] allows you to build in the floodplain as long as you elevate ... [but] as long as we're building and filling in the floodplain, we're altering the extent of the floodplain." Floodplain ordinances are essential for setting boundaries on development within the floodway and the floodplain, but the cumulative effect of decisions about land use on the floodplain is still largely ignored. The growing risk of greater flood hazard cannot be a factor considered by planning and zoning departments when they are relying on outdated FEMA maps for decisions on land use within the floodplain.

FEMA

The gray areas of this 2003 FEMA map show the floodplain west and south of the City of Eagle—an area that continues to experience substantial residential growth since this map was released.

With the rate of development at Eagle Island, the cumulative effect of subsequent developments can be a challenge when relying on FEMA maps. As Berggren states, "The maps that FEMA completed are no longer valid. When you put more houses and fill in, the extent of the floodplain changes. You can't keep up with that when you're doing floodplain mapping." Because mapping floodplains is an expensive enterprise, Berggren said, it is only done every 10 years or so. New FEMA maps were scheduled to be released in December 2014. Prior to the release of these new maps, planning was based on maps that came out in 2003, based on data from 1997. Since that time, the floodplain has been affected by land developments, gravel mining, flood control projects, and flow regulation. Gilman commented, "I can pretty much guarantee [the new FEMA maps] aren't going to show that the floodway is any narrower! If anything, they're going to show that it's wider, because we now have more development and activities along the river." The floodplain will continue to widen with new developments, and more areas will be affected

in the future. Some homes that weren't previously considered to be in the floodway will be included in the floodway in the new FEMA maps.

The story of Eagle Island begs for better land management practices. In addition to the risks and difficulty of having annual floods to residential areas, extensive gravel extraction and other factors have led to ecosystem degradation. Commercial and residential developments have led to bank instability and a greater risk of flooding. The Corps of Engineers is concerned with the risk of gravel pit capture, that is, when the river erodes into the gravel pit and changes its course. When the gravel pits are dug, only a tiny strip of land remains between the river and the pit. The river can quickly erode the strip if it jumps the bank. The result is that the entire

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Eagle Island State Park

river flows into these pits, "totally changing the hydraulic head [i.e., the mechanical energy of the flow] and causing upstream and downstream erosion," as explained by Berggren.

Eagle Island State Park and Ecosystem Restoration

One effort to prevent more development on Eagle Island is Eagle Island State Park. On the site of a prison farm operated by the State of Idaho until 1977, Eagle Island State

Park, created in 1983, encompasses more than a fifth of Eagle Island at 545 acres. It boasts 5 miles of horseback riding and hiking trails, 9- and 18-hole disc golf courses, horseshoe pits, volleyball courts, and a waterslide. Shelters and grassy areas make comfortable picnic spots, and a swimming beach and paddleboard rentals enhance the park's recreational opportunities.

In 2006, Ada County Parks and Recreation Department came out with a master plan for Eagle Island State Park that would have significantly expanded the park. The plan called for the creation of additional lakes, new wetlands, and a series of channels throughout the park. Cottonwood forest and native plants would occupy the perimeter of the park. While providing some great opportunities for outdoor recreation for a growing population, the plan also provided for flood control measures and ecosystem preservation. The plan was subject to funding, however, and never materialized.

In another planning effort, the U.S. Army Corps of Engineers conducted a feasibility study in 2010 at Eagle Island that focused on ecosystem restoration for damage caused by gravel extraction and other encroachments on the river. The project sought to improve the wetland diversity at the gravel extraction pits and evaluated methods for doing so. The feasibility study examined the possibility of creating shallow benches along the pond areas for fish called dabblers, eradicating noxious weeds, and improving cottonwood regeneration. "We felt that by restoring and improving habitat, cottonwood forest, and native vegetation in that area," Berggren explained, "we could really reduce the risk of pit extraction and thereby the flood hazard for those living on the island," Although the study was shelved because of lack of funding, it calls attention to opportunities for better land practice at Eagle Island.

SUSAN UTLEY

Great blue heron

Eagle Island needs habitat restoration and protection. The number of heron rookeries has declined on the Boise River because herons don't thrive in an atmosphere of disturbance or close proximity to people. Providing some open space away from development could improve their numbers. Fish

populations are also negatively affected by developments along the river and the loss of riparian habitat. Cottonwood tree regeneration has been affected as well. In addition to encroachment on the river, other factors contributing to environmental degradation include the creation of dams upstream, pollution and sedimentation, and increases in water demand by communities and farmers. Providing for open space to be maintained in perpetuity would help protect the existing habitat and floodplain functions while also allowing for space for water to go during flood events.

Marsh corridors, flood lakes, landfill, stilts, and waterproof basements have all been proposed as alternatives to levees and dams. But the issue remains hotly contested. In 2006, after Eagle City Council approved another 54 upscale houses on Eagle Island, many Boise Valley residents feared the worst. "The madness continues," said an editorial letter to the Boise Guardian. "I don't think dikes or levees are the answer. You'll just be pushing water into somebody else's place." Flood zoning, like all zoning, has always been windfalls and wipeouts. The sandbagging of a subdivision seldom lowers the risk of flooding. It merely displaces the risk of flood.

EMILY BERG grew up in Boise, Idaho, where she's currently finishing up her undergraduate degree in environmental studies. She enjoys studying the intricate relationship between people and the environment.