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Beavers as commoners? Invitations to river restoration work in a beavery mode

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Abstract Community development is related to ecological restoration in several ways. Degraded ecosystems have driven economic decline in communities. Developing institutions for managing and restoring community land bases has long been a strategy in community development. More recently, ecological restoration has been pitched to extraction-dependent communities as part of a 'just transition' to a low carbon economy. In this paper, I think across literatures in geography, ecological restoration and environmental politics to theorize a politics of ecological restoration that resists neoliberal co-optation while supporting Indigenous resurgence. I probe resonance and dissonance among three concepts that have been recently employed to theorize more-than-human relations in the face of extraction, climate change, neoliberal privatization and other Anthropocene phenomena. These concepts are: (1) the commons, one institution for managing land bases as well as an insurgent imaginary of post-capitalist governance; (2) precarity, an idea usually applied in urban settings to describe the late capitalist position of people, usually workers and (3) the more-than-human, an ecologically rooted theoretical perspective that thinks through social dynamics as imbricated with relations among species and entities living together. In my earlier work with a rural settler community trying to restore salmon stream habitats and runs, the idea of a multispecies commons emerged in interviews with residents and restoration workers, and inspired new watershed stewardship practices. Dené scholar Glen Coulthard's critique that commons discourse often erases Indigenous land claims and relations inspired me to think more-than-human commons more deeply, drawing on interviews from beaver-assisted river restoration sites.

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Dreams of natural streams

On a small cow pasture along Big Spring Run, a small tributary to a river that eventually ends up in the Chesapeake Bay, a small conceptual revolution has taken place over the last decade or so. This revolution began within the scientific field of fluvial geomorphology, and is now spreading out to the growing stream restoration industry, and to a loosely affiliated network of grassroots stream advocates, tribes and First Nations, and state, federal, and regional bodies that govern and implement river restoration projects. Given the polycentric and emergent nature of these informal networks, speaking of any one origin is problematic at best. Nonetheless, one origin point for the conceptual development I want to sketch was a study by Dorothy Merritts and David Walter, referenced in an accompanying *Science* editorial as 'Dreams of natural streams' (Montgomery, 2008). The Big Spring Run project arose through what Tsing *et al.* (2017) have called arts of noticing. Walter and Merritts excavated down through silty sediments to find traces of old beaver dams, pollen and insects characteristic of marsh. They eventually deduced that a stream with no fixed channels had lain buried and forgotten for centuries behind defunct mill dams that had filled up with silt. Walter and Merritts' (2008) paper challenged a foundational theory in fluvial geomorphology – Leopold, Wolman, and Miller's (1964) theory that a river flowing through gently-sloping alluvial sediments will tend towards a single, sinuous channel. Those early geomorphologists did not notice the old mill dams crumbling just downstream of their Big Spring Run field sites in the 1950s. So they never speculated that the river forms they so carefully documented were recent relics of settler land disturbance—namely beaver removal, land clearing and mill dam construction (Figure 1).

Big Spring Run is the site of an ecological restoration project. That is to say, it is a site where ecological precarity, thresholds, and tipping points are investigated and manipulated by human agents. It is a site of protracted encounter, where human invitations to more-than-human responses have reshaped water and land. For the project's designers and for others who witness it, these reciprocal responses among humans, water, plants, animals and microbes evokes an otherworldly sense of a lost world that is simultaneously a utopian future. (To use queer theorist José Muñoz's (2009) term, this future is not yet here, but glimpsed and felt in flickers of insects, in rising and falling flood waters during storms, in the emergence of long-forgotten plant communities which are currently confined to the few acres of the restoration site, which is surrounded by pastures, roads, and houses.) I was one such witness, in a room full of 300 restoration practitioners and scientists where Dorothy Merritts showed videos during her

Figure 1 Big Spring run restoration cite (center of image) with unrestored reaches up and downstream. The site is located in the Chesapeake Bay watershed near Lancaster, PA. Photo courtesy Dorothy Merritts.

keynote (Merritts, 2018). In a time lapse video of the project, one sees bulldozers scraping away five meters of fine sediment that had filled in behind an eighteenth century mill dam, covering the old boggy beaver meadow below. Then rains come and fill up the shallow bowl of the nascent meadow, then dispersed via dozens of small, branching channels. In the minute or so that the time lapse videos ran, we audience members leaned forward in our seats as the bulldozers darted around with loads of sediment. I held my breath as the rain began to fill the bare site, then let my breath out slowly as the waters spread out and quickly sank away. One year later, sedges and flowers and grasses had sprouted up, some from that buried seedbank, some brought in on the feet of birds, some drifting downstream. In a video of a storm that second summer floodwaters rise slightly, then fall slowly, in a pulse of muddy water that clears as it passes through the site. In the auditorium around me, a murmur of excitement spread along with the floodwaters, punctuated by several quiet 'ahs'.

Some origins for the more-than-human commons

Relations made by commoning within more-than-human commons (to use Bresnihan, 2015's terms) seemed to be in the air during Dorothy Merritt's

talk. I theorized such a commons in conversation with rural residents working to restore salmon runs on Salmon Creek (CA, USA), who considered groundwater to be a common resource, not only for people to use, but for fish, riverine plants, and wildlife (Woelfle-Erskine, 2015a,b). The multispecies commons as I described it there is akin to what Anna Tsing (2015) has called a latent commons, in that no formal ownership rules or regulatory practices are defined, and yet human users share ideas of commonality and interdependence informally. In interviews with Salmon Creek residents, I heard the imaginary of a multispecies commons emerging as a different awareness of watery entanglements that arises from an acute awareness of scarcity and extends to concern for other creatures. Drawing on Ostrom's (Ostrom, 1990) characteristics of commons governance institutions, I theorized that this imaginary arose from a detailed local knowledge of one's water source, of neighbors' water use practices, and of local weather cycles. As salmon populations dwindled in the watershed in the late 1990s and early 2000s, these local knowledges circulated via institutions (a land trust, a watershed council, at various community events and at the local bar). Shared understandings gradually emerged: a refusal of 'fish vs. farms' binaries, a commitment to supporting salmon recovery and continued agricultural production as essential to local cultural identities, and, as the drought deepened in 2013–2015, resentment at meddling by county and state water managers. (Despite these shared understandings, incommensurabilities persist, rooted in people's different economic stakes in local waters, and sometimes resurface as conflicts over water, or salmon, governance.)

At Big Spring Run, the more-than-human commons includes Walter and Merritts' scientific team; the people who drove the bulldozers and the landowner who agreed to reconfigure their cattle pasture into a wet meadow; the dragonflies and flies and mayflies and stoneflies and bees and beetles that found this scrap of otherworldly flood (perhaps smelling ancient pollen grains), as well as the otters and marten and fish and frogs that followed and now swim there. The more than human commons must extend to include the cows that graze the land just beyond the property boundary, whose manure is transformed into plant bodies and then into bees and birds and people; the storms that surge and fill and flood the many small shifting channels; and the black soils forming again in the roots of the sedges and flowers, overlying the black sediments of pre-settlement beaver meadows. The imaginary of the multispecies commons that Dorothy Merritts sketched in her talk also extends downstream to Chesapeake Bay, listed by the US Environmental Protection Agency (EPA) under section 303

(d) for impairment[1] because of fine sediment and nutrients. She shows data demonstrating that the restoration project has reduced sediment flowing downstream, as those sediments are now entrained in the many-channeled floodplain. Big Spring Run's scientists and policymakers envision extending this experiment to thousands of similar cow pastures and suburban neighborhoods, thereby clearing the Chesapeake waters and restoring crab and oyster fisheries there. And the imaginary of the more than human commons may travel – via scientific papers, videos on the project website and presentations like these – into the imaginations and regulatory practices of people seeking to restore other rivers and wetlands.

The sense of renewal, of restored possibility for a good livelihood, and of collective governance embodied in these various commons had purchase for settler descendants, ecologists, bulldozer drivers and surveyors in that conference auditorium at the 2018 River Restoration Northwest conference. Bresnihan's (2013) manifold commons captures the spirit of the kinds of iterative experiments that these practitioners described in posters, presentations, and informal conversations: 'the many different natures which unfold through ongoing, negotiated and changing relations between people and things' (Bresnihan, 2013: 71). Theorizing from John Clare's poetry, he describes 'the ways in which common life materializes beyond existing categories, expanding our life-needs rather than shrinking them', arguing that '[t]his emphasis on the experimental and relational character of the commons, as ongoing and variable, helps us to think and feel our way beyond the current, urgent claims to preserve a finite planet' (Bresnihan, 2013: 88). Such possibilities beyond the narrow visions of state and federal regulatory mandates are necessary for these river restoration practitioners, who are acutely aware that beyond a few scattered projects, extraction and development continue to push aquatic species towards extinction. My hope, in drawing out some political implications of a compelling idea in river restoration, is for these practitioners to see their work as one strategy among many by the different species and elementals within a given more-than-human commons. Perhaps, this understanding can invigorate ecological politics within the ecological restoration field.

For commoning with the more than human can also echo violences done by other forms of communing. In her keynote, Merritts framed the project as a restoration to 'Stage 0' – a conceptual model in geomorphology

1 Impairment is a technical term used by the United States Environmental Protection Agency (and US aquatic scientists more generally) to describe damage to ecological processes by pollutants. These pollutants can include 'natural' substances like silt nitrogen, phosphorous and mercury that enter waters at higher levels because of human agriculture, mining or land disturbance as well as human-made substances such as PCBs or pharmaceuticals.

describing the form and processes of streams across temperate North America before European settlement (Cluer and Thorne, 2014). Settlers disrupted flows of water and sediment by building dams (like the colonial mill dams Merritts studies), cutting forest, plowing land, building levees, draining swamps, and so on. These activities turned broad marshy floodplains into deep gullies, which may, over tens or thousands of years, widen, form new, lower floodplains and slowly fill back up with sediment. In Cluer and Thorne's model, this stream would progress through Stages 1–7 (perhaps non-linearly) and then eventually back to Stage 8, which is the same as stage 0 (Figure 2). The diagrams outlining the Stage 0 concept —and Merritt's discussion of them—lack Indigenous presence. In Cluer and Thorne's discussion, various settler activities are described as influencing (and usually degrading) rivers, but Indigenous management activities (burning, dredging, forest management, stewardship of beavers, cottonwoods and other keystone species) are erased. Stage 0 reprises *terra nullis*, the doctrine that North American lands were largely untouched by Indigenous presence (and management). In the image of scraping away fine sediment to a pre-settlement pristine floodplain, there is a danger: the idea that by clearing sediment washed down from cleared land on settler

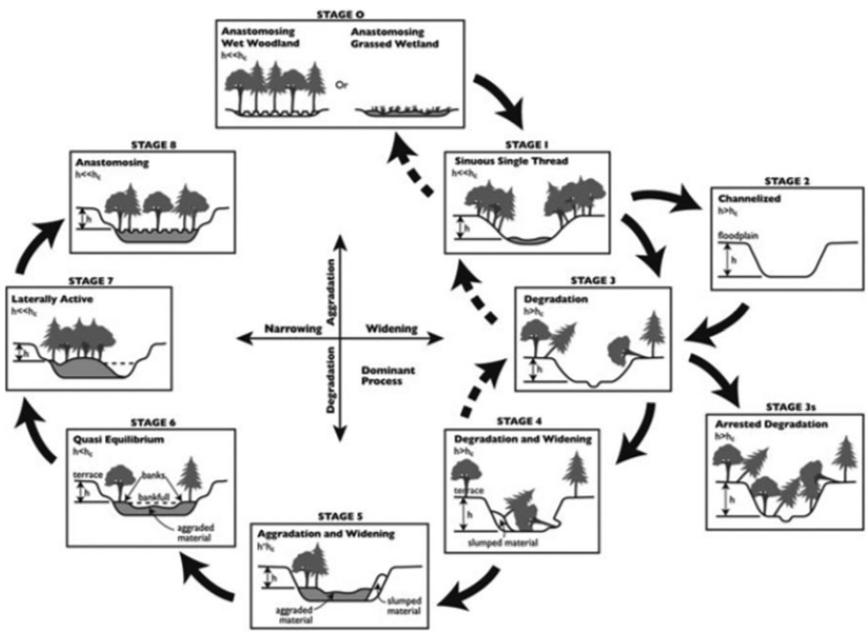

Figure 2 Diagram of the channel evolution model from Cluer and Thorne's, 2014 paper. The model shows common changes in river channels following disturbances (grazing, logging, paving, climate change), as well as some common feedbacks and stopping points. Stage 0 and Stage 8 channels are identical in function.

farms behind settler mill dams that sawed the cleared logs and milled the grain, settlers can return to an Edenic state of innocence, restoring (non-human) ecological relationships without working to repair colonization's damage. As Tuck and Yang note, 'decolonization is not a metaphor': it is accomplished by restoring land and legal authority for management to Indigenous people (Tuck and Yang, 2012).

Indigenous critiques and commons

Two years after I first theorized multispecies commons along Salmon Creek, Dené scholar Glen Coulthard articulated an Indigenous critique of the commons that posed an important challenge to my thinking on multispecies commons. In a recent interview in 'Upping the Anti', on urban anti-gentrification work in Vancouver, he expanded on this argument, saying,

[I]f we are committed to reclaiming the commons we are going to have to work critically to re-establish non-capitalist and decolonial social relations and legal traditions that have survived through generations of Indigenous communities. It's not just about land; it's about the legal and customary relationships that emerge from our connection to the land that are integral to imaging new formations beyond private property.

In light of Coulthard's critique I'm thinking again about the politics and pitfalls of the anti-capitalist commons, by way of a different lineage of commons thinking: the anti-capitalist commons rooted in urban, anti-globalization, largely European protest formations where it arose and continues to influence, for example, anti-water privatization movements in Barcelona and Naples. Having lived briefly in Europe and witnessed a sharp divide between urban and environmental politics in many activist and political ecology contexts,[2] I was interested in whether and how multi-species (or more than human) relations could expand the reach and relevance of politics of commons in those European urban contexts.

The commons that Coulthard critiques are not necessarily the Spanish or Southeast Asian commons that Ostrom's (1990) governance principles arose from. They are not the Indian forest commons that Agrawal describes making environmental subjects in Kumaon in northern India in the shadows of British colonial rule in India. Nor are they the commons Linebaugh (2014) or Federici (2004) theorize from, facing and resisting enclosure. Rather, Coulthard speaks to a turn of the 21st century discourse of the commons that arose on the streets during anti-globalization protests,

2 The Q & A at Kim TallBear's keynote at the 2016 ENTITLE political ecology conference in Stockholm, Sweden first sparked these thoughts; they evolved other panels, papers, and conversations at that conference, at the 2016 IAS-STS conference in Graz, Austria and with Alfred Decker.

and then was taken up in different forms by grassroots organization, NGOs, and leftist think tanks. The commons was a way for us European descendants to reach back into our collective histories towards early moments of anti-capitalist refusal in various anti-enclosure movements during the transition to capitalism.

I encountered this strain of commons thinking long before reading Ostrom, in the streets during anti-globalization protests and at guerrilla gardening actions following the 1999 Seattle WTO protests. Caffentzis, Federici (2014) anti-capitalist commons displays many of the elements I was attracted to as a young activist: a ground for pro-environmental politics, a rejection of alienation and corporate control. Among these qualities are '[c]ommons are not given, they are produced; [t]o guarantee our reproduction 'commons' must involve a 'common wealth', [and e]qual access to the means of (re)production and egalitarian decision-making must be the foundation of the commons.' These precepts resonated with me as a young activist wanting to reclaim neglected urban land for gardening and public space, and localize water supply through guerrilla greywater installations. However, in that desire to re-create public space in increasingly privatized cities, we aspiring commoners did not consider Indigenous sovereignties in the lands and waters where those cities now stand. More recently, the inability of most Occupy activists to engage with Indigenous calls to change the name of the movement to 'Decolonize' illustrate that this tendency towards Indigenous erasure is alive and well on the US left (see for example, Barker, 2012, and also blackorchidcollective, 2011; *Decolonize Oakland: Creating a More Radical Movement – Occupy Oakland*, (n.d.)).

Coulthard's analysis of urban politics of the commons challenges Federici and Caffentzis' unexamined 'we' and 'common wealth'.

> Most of us live in cities now, and one of the biggest impediments to decolonization is this discord between experiences that are more 'on the land' and experiences in urban contexts. In *I Am Woman*, Lee Maracle says that one of the problems with this distinction is it erases the fact that cities, just like rural areas and everywhere else in settler colonies, are on Indigenous land. Cities must be understood as an important terrain of struggle, and they will inform our struggle in important ways as well.… we can no longer act as if they are isolated struggles; blockades disrupting the construction of pipelines and the reclaiming and renaming of city streets … are part of the same struggle that is unfolding through different geographies.

Here Coulthard is speaking specifically of Vancouver, B.C. in Canada, and more generally of cities in settler-colonial contexts, not European cities. So while his critique might not resonate in Naples or London, it certainly bears on Seattle, where I live, or in Sweden, where systemic Sami erasure

continues (Öhman, 2010). Activists in settler-colonial contexts should, as Coulthard suggests, root urban land politics in specific Indigenous self-determination struggles, and also challenge discourses of commons that erase Indigenous survivance by assuming an undifferentiated settler (or settler / arrivánt) public.

Some Indigenous theorists and activists have theorized more-than-human commons as Indigenous modes of relating (see for example Kimmerer, 2015 and the interview with Chas Jewett in this issue), as have many Indigenous activists I've encountered at protests and gatherings. Slowly, in my Salmon Creek work, I began to recognize ideas of the multi-species commons rooted a decade earlier, during a year spent doing solidarity work with Mexican and European activists in Indigenous Zapatista communities. There, building water tanks or clinics, and swimming in the river afterwards, I noticed the ways Tzozil and Tzeltal *compas* related to plants and animals – familiarly, and with deep and specific knowledge. They knew the *milpa* and cows and also wild creatures intimately – a boy grabbed a flying cockroach out of the air while visiting the foreigners, stripped its wings, and ate it; everyone warned us about a swimming, flying, deadly snakes that lived in the pool above the waterfall where we swam and washed clothes. The *compas* didn't talk about the commons, much less the 'multispecies commons' – they had their own words and concepts for their collective relations to the land. But some tried on the concept when I and the European and Mexican activists used the language of the commons as a way to try to speak across cultural difference – Spanish-USA and Italian-Mexican, as well as English-Tzeltal. Sometimes, we outsiders would invoke distant ancestors resisting enclosure in Europe as a way of articulating a shared lineage of anti-capitalist refusal. The commons I came to see in Chiapas – of people living and seeing other species as co-inhabitants and co-creators of shared worlds – stayed with me as I listened to Dené, Winnemem Wintu, Karuk, Klamath Tribes and Lower Elwha Klallam tribal members speak of more than human relations. I think that my concientization in Chiapas allowed me to see Salmon Creek settler residents' yearning to join a more-than-human commons there.

In the remainder of this paper, I will think openly and critically about the purchase and danger of the more than human commons. Towards this end, I will think with another concept circulating in anti-capitalist street protests: precarity. Drawing on interviews with people who are working with beaver to restore salmon habitat in the western USA, I will consider beavers' worlds in several lights:

> [beavers] as a commodity, and expressions of precarity that disclose potential harm and/or transformation; dynamic multispecies relations

> and the politics of encounter: from encounters with living organisms [beavers and salmon] to encounters with things and processes (capitalism, colonialism, [channel evolution], etc.); precarious [salmon or beaver] bodies and/or ecological systems [streams, wetlands], exploitation within and/or across species barriers [i.e. via the Fur Trade]; affects of social and/or ecological formations [as in new moves to consider beavers as restoration partners]; nonhuman labor [are beavers workers?]; technology [i.e. beavers' stick and mud leaky dams] and precarity; precarity and the anthropocene [drawing on Dorothy Day for a politics of resisting precarity in the anthropocene]; and nonhuman ethics [based on generosity in life and death].[3]

Precarity and the more-than-human

In 'Towards a critical politics of precarity' (2017), Kathleen Millar traces a lineage originating with Judith Butler:

> In *Precarious Life: The Powers of Mourning and Violence* (2004), Butler suggests that the social nature of human existence means that we are dependent on and made vulnerable to others – vulnerable both because we might lose the very people with whom we have formed relationships and because we are exposed to others and that exposure always comes with the risk of violence. Precariousness, for Butler, is about 'a common human vulnerability, one that emerges with life itself' (31).

Millar critiques Tsing (who she identifies as writing in this lineage) for diminishing precarity's analytical purchase by extending the concept to other species' life possibilities. Tsing (2015: 2) defines precarity as 'life without the promise of stability,' emphasizing interdependence among humans and other entities threatened in capitalist wastelands. I disagree with Millar that this definition weakens the concept, and see Tsing's major contribution as recognizing a blind spot in sociological work on precarity: the lack of understanding of human sociality and work as bound up with more than human worlds.

In river restoration work (as in resource extraction, farming, and wildcrafting), people work with other species, and with elementals like rock, coal, soil and water, in the everyday of the field. Even in office or service industry jobs, people work with these entities, although that work is mediated by hydropower dams powering server farms, distant mines and forests, and more-than-human bodies that receive wastes from human

3 Text not in brackets in this paragraph is from Phillip Drake's Call for Papers for the panel 'Animal Studies and Multi-species Precarity: The Politics of Living and Dying Together (DOPE Conference, U Kentucky, Feb. 22-24), on which I was a panelist.

industry. Marx understood this cycle of matter and energy as metabolism (see Foster, 1999); discard studies scholars (see for example Says, 2014) and feminist materialists (e.g. Barad, 2003, 2007; Bennett, 2010) remind us that everyday objects are always co-constituted with vast, articulated more than human entanglements. If we see human labor in relation with other species' modes of being, then thinking of beavers as workers through an analytic of more than human precarity does important conceptual and political work.

In my earlier work on multispecies commons, I proposed that salmon make it impossible not to think of space and connections and interlocking climate and ecological cycles. Salmon bodies swimming become food for so many others – as eggs, as fry, at sea, caught by a bear or eagle before spawning, scavenged on the bank, shat out and taken up by trees. Salmon embody an interspecies generosity in both life and death. Now, in thinking through precarity and commoning with beavers, I offer that beavers make it impossible not to think about interdependence and practices of care. Beginning with a rethinking of Butler, alongside Tsing, about a common more than human vulnerability that emerges with life itself, one cannot think of individual beavers or humans only. Because both beavers and humans are social creatures, one must think on conditions of life for family units, and then for populations. Beaver families' vulnerability in this current moment of human domination of most of their habitats comes from human actions that leave populations poised on thresholds, because their river valley habitats have been degraded by human alterations in flows of water and sediment, while their populations are still decimated by ongoing trapping and predation and legacies of Fur Trade era flows of capital.

Back in 2013, I interviewed seventy people interested in partnering with beavers to restore coho salmon habitat, among them biologists working for state, federal, and tribal agencies, NGO employees, grassroots activists, trappers, farmers, ranchers, and former loggers. At times writing collaboratively, I analyzed these partnerships' potential to disrupt discourses of Manifest Destiny[4] and river control in human engineering (Woelfle-Erskine and Cole, 2015; Woelfle-Erskine, 2017). Dan Sarna-Wojcicki and I wrote about hyporheic imaginaries – shifting discourses around groundwater and salmon habitat in the Scott Valley (CA, USA) – associated with beaver dams and human-built analogs (Woelfle-Erskine and Sarna-Wojcicki, 2013,

4 Manifest Destiny is a doctrine of white supremacy that influenced US westward expansion during the late 1800s. The doctrine stated that white settlers had a God-given right to subdue unruly lands and indigenous peoples. In earlier work on this concept, Cole and I argue that residues of this doctrine remain in contemporary water policy as discourses of (settler) human dominance over dynamic natural forces such as floods.

in review). I return to these interviews now, with a different purpose, and also as I am beginning to work with some of my interviewees on hydro-ecological studies of salmon response to 'beaver dam analog' partnerships.

Are beavers workers?

Citing Bourdieu, Millar argues that precarity's important work happens through thinking about humans as 'workers with insecure employment' (Millar, 2017: 3). Without recapitulating that argument in detail, I will gloss some of the concepts of work that emerged in my interviews about beaver-assisted river restoration. This idea that beavers are workers was prevalent among many people who spoke of partnering with beavers, especially those who worked for cash-strapped agencies and NGOs. For example, one biologist working for the Oregon Department of Fish and Wildlife said,

> beaver are [extremely efficient] at restoring areas. They're kind of 24/7 on site, on call. We're spending a lot, millions of dollars a year, the US Fish and Wildlife Service and the state, doing hard restoration, hard engineering, and then we're often not able to fund the maintenance of those projects after they're installed. Beaver's the least expensive option all things considered.

Here, we see the beaver as low-wage laborer, working efficiently for government projects in an age of neoliberal outsourcing.

Other people I interviewed talked about caring for beavers because they are industrious, self-directed workers, embodying a Protestant work ethic to avoid idleness and to cultivate the wilderness (though the products are aquatic habitats and more beavers rather than crops). For example, a scientist working for a Utah-based NGO said,

> At a gut level, humans understand what dams do, because we build dams. And at a gut sense, they recognize the worker. I think at some gut level, people identify with something that works so hard, and is so industrious, and builds things. That's what we do. We mess around with the trees and the forest – it's someone like us.

She and a former logger both described an ethic of care that arises from this recognition of beavers as a kind of nonhuman kin. They planted extra willows and other vegetation as food as part of revegetation projects to ensure that beavers' basic needs would be met.

These conversations led me to wonder: Which other humans might recognize a beaver as a worker, made precarious by capitalism, and make common cause? Would a unionized plumber installing water-conserving

toilets recognize beavers as fellow water workers and exploited members of the working class? Would an urban European activist struggling against privatized municipal water supply in the streets care about a beaver? Possibly through climate politics, flooding, or drought, though (in my admittedly limited survey of these protests in the popular media) the politics of creeks and wildlife rarely enter urban European discourses of the commons.

Some restoration practitioners and geomorphologists who work to reshape streams into more complex networks of pools and side channels might talk of work in the physics sense: the application of a force that displaces something (a tree, water) in the direction of that force. Beavers' work on a tree makes a dam that influences the work of water in moving sediment and debris. Collectively, these dams then rework alluvial beds and reshape floodplains. Rural settlers in the U.S. and Canada who already live closely with beavers might possibly identify with them as hydraulic workers, observant of their diligence in dragging branches to and fro, and the (undesirable) modifications they make to human hydraulic works like irrigation channels and culverts. One former logger mentioned that beavers, too, often are injured or killed by trees they fell. Among farmers and ranchers who wanted to partner with beavers to increase stream flow and groundwater recharge, references to beavers as tools were frequent. This conception was often accompanied by people's insistence on maintaining the prerogative to kill 'problem beavers'. Thus, these beavers face uncertain chances, not just for employment as Bourdieu's precarious workers, but for life itself. On the other hand, some rural residents saw themselves and beavers as harmed by the same legacies of capitalist extraction, dredging, and logging. Beavers' food sources and places to live had shrunk drastically in rivers that ran dry in summer. Ranchers saw their ability to pump groundwater for irrigation threatened by increased government regulation and climate variability. Some ranchers saw possibilities for alliance, and built 'beaver dam analogues' or let beavers' own dams remain to recharge groundwater and provide cool water habitat for salmon.

Workers in the river restoration sector may see beavers as doing the same work, and thus have a glimmering of solidarity based on learning from them. Many of these people are also somewhat precariously employed, in Bourdieu *et al.* (1963, quoted in; Millar, 2017) sense – seasonal workers, tree planters, high-end consultants always hustling new contracts – working as contractors because civil service jobs have been eliminated. If so, these workers may decide that working with beavers furthers their goals of storing water or improving salmon habitat. But as Cole and I argued elsewhere, beavers cannot be said to be working for humans or sharing human goals: 'A trans reading [of beavers' hydraulic activities] might understand beavers

as transgressive, as disruptors of ecosystems and human works, whose own works yield not only biodiversity but human possibility' (Woelfle-Erskine and Cole, 2015: 307).

Tribes may see beavers as workers but, following Robin Kimmerer, would see them as 'older relatives' whose mode of life forges relations with other beings (Kimmerer, 2015). For example, Yaqui restoration practitioner Dennis Martinez, who has worked with the Karuk and other tribes on watershed renewal projects, argues that humans and other species all have a role to play in renewing ecological processes. Humans contribute their unique gift of foresight to the life ways and spiritual guidance that other plants and animals bring. 'Plants and animals come into the ceremonies. We have equality on that plane. We have equity. We just have different jobs' (quoted in Woelfle-Erskine, 2007). This view of shared work outside of the wage economy could resonate with Millar's 'possibility that forms of work beyond wage labor might open up other political possibilities.' Similarly, restoration work undertaken collectively, on common or public lands, resonates with Catholic Worker Dorothy Day's 1952 call to embrace precarity as a rejection of capitalist striving, just as beavers embrace dynamic storm flows that blow out their stick and mud dams (quoted in Millar, 2017).

We see from these interviews that different kinds of human workers often consider beavers to be workers, though of different kinds. They might be considered contingent workers, generous workers, workers refusing wage labor and all its strictures, workers on the night shift without pay or benefits. These various senses map on to the senses of precarity Millar (2017: 7) describes:

> 'For some, precarity certainly describes an experience of loss. But for others, it might constitute a refusal of waged work, an alternative political subjectivity, or a mode of life that does not conform to liberal ideals. In fact, as Isabell Lorey has argued, it is in the very experience of loss and contingency that the potential for refusal arises'.

A few of my interviewees described beavers' work as more than the prosaic raising of water tables or increasing salmon abundance. Like the audience at Dorothy Merritt's talk, they saw beavers' work of recreating floodplain meadows and cool, willow-shaded streams as a lovely awakening of the land's lost potential. In some cases, experiencing this potential made them realize how blasted (to use Tsing's (2012) term) their home landscapes had become. By facilitating beavers' flourishing, these people hoped to reintegrate themselves into the web of life.[5]

5 I call this reveling in ecological complexity and becoming-with beaver the Beaver Dream, and theorize it more fully in my forthcoming monograph.

Are beavers commoners? Theory from Indigenous science

So far, I have introduced the idea of multispecies commons, thought through the possibility that beavers can be partners who are special kinds of precarious workers, united with humans in their vulnerability to changes in rainfall and streamflow and legacy ecological disruption, and provided examples of settler restoration workers reveling in ecological renewal. I now want to weave all of these ideas back into the commons, mindful of Coulthard's critique, to see what happens if we imagine the beaver as a commoner in more-than-human worlds. As Chas Jewett notes in this issue, Indigenous theories, land recovery practices, and politics of land and water protection don't need European notions of the commons, because they have other terms that signal human responsibilities to and entanglement with the more than human world. Settler restorationists do need beavers as commoners, beings with whom they can make common cause to see multispecies commons.[6] They need beavers to re-imagine restoration projects as invitations – as invitations to beaver, but also as invitations in a beavery mode. To invite beavers into a stream is to invite dynamism when their dams burst and lose a flood of sediment, and inviting dynamism means letting go of human control of the fixed boundaries of a river channel and the hydrosocial understanding (Linton, 2010; Linton and Budds, 2013) of water systems as networks of human demand. Much contemporary water politics, even many of the struggles with which this special issue is concerned, still cuts off human concerns from the more than human.

The Standing Rock water protector movement was a prominent example of another mode of water politics: one that articulated human health and tribal sovereignty as bound up with river health and river sovereignty. Indigenous struggles for treaty rights have long articulated these reciprocal relations as sovereignties. Particularly relevant to the case of salmon is Nisqually Fish Wars veteran Billy Frank, Jr.'s framing of respect as central to a politics of respect and solidarity beyond the human (Wilkinson, 2006). More recently, Chas Jewett has noted resonances between ideas of land and water relations at Standing Rock and Irish water movements.

Indigenous worldviews increasingly influence river and ecosystem science, though this influence is uneven, as Chas Jewett notes in this issue. In the Pacific Northwest of the USA where I now live, for example, many tribes are now powerful players in science and policy relating to climate

6 Beavers are just one possible example of a relation-maker: any species can help make these relations. I heard scientists and grassroots activists make connections to multispecies commons via salmon, orcas, kelp, otters, urchins, various insects and fungi; multispecies ethnographers have documented a range of other species relations.

and fish and wildlife management. Tribes often with mixed native and non-native staffs, use standard ecological, geomorphic, and hydrologic methods within Indigenous frameworks like First Foods (Umatilla, Yakama) or Indigenous Health Indicators (Swinomish) to devise and implement ecological restoration projects. When they present at conferences like the River Restoration Northwest meeting, tribal representatives often introduce their work through a discussion of relational ethics. Their presentations often illustrate Lakota-Dakota philosopher Deloria (1997) assertion that '[t]he major difference between American Indian views of the physical world and Western science lies in the premise accepted by Indians and rejected by scientists: the world in which we live is alive.' Deloria's writings serve as a provocation to scientists in the western tradition: taking Native American world views seriously will necessarily transform ethical practices in science, with regards to anthropological 'subjects', animal 'subjects' and conceptions of time, scale, and causality. Deloria predicted that western science would independently verify conclusions of Indigenous science. At River Restoration Northwest, there were signs of this happening. 'Stage 0' concepts echo the Nez Perce tribe's approach of removing impacts and let rivers and salmon run freely. Dam removals re-enliven sediment pulses off-shore of the Elwha River, allowing the Lower Elwha Klallam Tribe to resume long-dormant shellfish harvests. Samish beach restoration projects create landing areas for canoe journey and spawning grounds for herring. These restorations (and the data tribal and non-tribal scientists collect in their wake) inspire new ecological and geomorphic models, and interdisciplinary understandings of how water, sediment, and life dynamically relate along shorelines of all kinds.

Conclusion: Commons dangers and the more-than-commons

This dynamism and ecological call and response animates the Beaver Dream (as I have called it elsewhere), and also the Herring Dream, the Geoduck Dream, and of course the Salmon Dream. The worlds that these Dreams evoke are, in some sense, webs of resource exchange, imagined commons, and latent commons (to use Anna Tsing's suggestive phrase) that persist unacknowledged and untended underneath capitalist resource extraction economies. As seductive as these dreams are, they often prolong settler-colonial erasures. When settler ecologists long for an a-temporal pre-contact 'messy' floodplain, they often envision it without its human managers and shapers, Indigenous people. They may see an uninhabited landscape or one used primarily for settler recreation rather than a cultural

landscape where native families live, work and fish. If these dreams are more-than-human commons, then perhaps they are in fact more than commons – more expansive in political vision than non-Indigenous commoners have so far been able to articulate (the exception here, I would argue, is José Esteban Muñoz's brown commons, fragments of which are available as talks, or were published posthumously). One way for commons thought to honor Indigenous commitments, or at least not erase them, is to center Indigenous relational practices as akin to *commoning*[7] (to use Peter Linebaugh's (2014) formulation of commons as activity). Thus, can we settlers who yearn for a purpose in commonly re-making ecologies contribute to Indigenous re-making of more-than-human worlds – Indigenous efforts that predate Manifest Destiny's rending of relations on the North American continent, and project into the future.

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7 For another analysis of commoning, as a practice rooted in anarchist and socialist traditions of the nineteenth and early 20th centuries, see Swyngedouw (2010).

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