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## Conclusion:

### Salmon Trajectories along the North Pacific Rim

*Diversity, Exchange, and  
Human–Animal Relations*

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#### INTRODUCTION

Salmon realities are fraught with paradox: Never before has salmon been so readily available for so many people. From being the “king of fish,” a precious luxury item and the backbone of subsistence economies in the North, salmon has become what some would call “the chicken of the sea,” an affordable source of protein sold in large quantities in supermarkets and restaurants across the world. But the story can also be told as one of loss and decline: Previously found in rivers across most of the northern hemisphere, Pacific salmon is now under threat in areas where it was previously abundant. Its decline is most pronounced around the eastern Pacific Rim, in British Columbia and the United States south of the Canadian border, while it is more abundant further north and west, with Kamchatka, Sakhalin, and Alaska being the richest salmon regions in the world. In a similar retreat toward the remote North, its Atlantic cousin vanished more than a hundred years ago from the industrialized regions of continental Europe and is now mainly found in the rivers of Scotland and Norway.

These contradictory realities of abundance and decline are not entirely unrelated. As Courtland Smith shows in the first chapter of this volume, models and metaphors of agriculture have redefined human–salmon relations and introduced ideals of cultivation, exploitation, and control. These practices have, in turn, altered circuits of reciprocity that previously favored

the return of salmon year after year. The emergence of salmon aquaculture on a massive scale is the most direct example of the way terrestrial agricultural practices have informed our relations with, and been tried out in relation to, marine species (Lien 2007a). Salmon aquaculture thus explains Atlantic salmon's affordability and worldwide abundance today<sup>1</sup> but is simultaneously a threat: aquaculture may affect wild salmon fisheries both directly, through the exchange of pathogens, parasites, and genes (Naylor et al. 2005), and indirectly, through the pricing of salmon in a global market of consumers who do not always differentiate "*Salmo domesticus*" from its more self-sustaining river cousins.<sup>2</sup>

But the relation is also more complex. The current threat of salmon aquaculture to self-reproducing salmon rivers is only the most recent in a series of dramatic and devastating changes to human-salmon environments. These include alterations of river systems by dams for hydroelectric power, river transport, dumping of industrial waste, pollution, overfishing, and other intended and unintended consequences of industrial growth, urbanization, and increased population densities. As demonstrated in the case of the Columbia River basin, as well as in France and England, such alterations severely undermined or destroyed the viability of what were previously abundant salmon rivers, long before the advent of modern salmon aquaculture (see Colombi, chapter 9). To some extent, salmon appear to do well as long as humans are relatively few and far between, such as in remote parts of Alaska and eastern Russia.<sup>3</sup> Paul Greenberg (2010:35) in his book *Four Fish* argues that while Alaskan salmon outnumber Alaskan humans by a ratio of fifteen hundred to one, the corresponding ratio for the world of humans and salmon globally is one in which humans outnumber salmon somewhere around seven to one.

But the simple conclusion that humans represent a threat to salmon overlooks the ways in which humans have sustained salmon and contributed to the proliferation and well-being of both. As this book demonstrates, humans have intervened in the lives of salmon in a variety of ways, from the stocking of rivers with fry (see Colombi, chapter 9, and Reedy-Maschner, chapter 6) to the rearrangement of rocks to create resting ponds for salmon swimming upstream (see Menzies, chapter 8, on Gitxaala management practices). This was the case in the Pacific Northwest, where salmon sustained large Indigenous populations.

This chapter draws together and elaborates some of the insights that have emerged from the preceding chapters. Presented with such a broad range of case studies of salmon and indigeneity along the north Pacific Rim, my response could be to draw some generalized conclusions, or grand

narratives, that could summarize our present knowledge of human–salmon relations and serve as a guide to better governance. I have chosen a different approach. Acknowledging that the ethnographies presented here are both extremely rich and at the same time only partial accounts of the realities they seek to reveal, I ask instead how they may challenge our assumptions about both salmon and indigeneity, and I look for differences rather than for generalizing traits. In this way I hope to avoid erasing those very differences that may serve as templates for alternative futures.

One insight that emerges from the previous chapters is that Pacific salmon both grow out of and shape relations between humans and non-humans in ways that defy a sharp distinction between nature and culture. This insight implies that the distinction between the domesticated and the wild, which tends to structure environmental policies, cannot be taken for granted. Rather, as I shall argue, salmon and humans have taken part in each other's lives through forms of co-evolution that have important implications for the ways we may conceptualize sustainable human–animal relationships in the future. Furthermore, we see from the studies presented here that such sustained relations can take many different forms, which may or may not involve forms of domestication, monetary exchange, symbolic elaboration, exclusive fishing rights, and permanent settlements.

Another insight that emerges from these case studies relates to the different ways in which salmon are known and their elusiveness in the human–salmon encounter. As we attempt to trace salmon lives through various spatio-temporal trajectories, the salmon itself emerges as largely unknown and mostly out of sight. Its migratory routes from rivers to the sea and back again, and the simple fact that it lives under water, make it hard to grasp (Lien 2007a, 2007b; Lien and Law in press). But although salmon migratory routes have been a puzzle for salmon biologists, the fact that salmon must pass through coastal waters and river mouths to get into the rivers to spawn brings them into closer proximity with humans than many other migratory fish. Because coasts are where most people tend to gather, salmon–human contact is almost inevitable.<sup>4</sup> Furthermore, as we shall see, salmon not only defy sharp distinctions between nature and culture but also challenge the assumption that nature can be known as something completely separate from the human realm. As we shall see, salmon may be known in a number of different ways, and human ways of knowing salmon fundamentally depend upon the techniques of knowing that are available to us. Unpredictability thus remains a feature of human–salmon relations (see, for example, Kasten, chapter 4), yet the entangled livelihoods that salmon enable also involve particular ways of knowing that are, in turn, as

diverse as the sociomaterial relations that sustain them. Hence, as we shall see, the scientific mode of knowing salmon emerges as only one mode of knowing among many. In the following sections I will elaborate these ideas, in conjunction with findings from the previous chapters.

### “NOT WILD, YET NOT NOT-WILD”

In the opening paragraphs of his book *Soul Hunters*, anthropologist Rane Willerslev (2007) tells the story of a Yukaghir hunter in northern Siberia who dressed up as the elk he is about to shoot. Willerslev portrays the hunter as he hid behind a tree, covered in elk skin and under the weight of elk antlers, as someone who was “not an elk, and yet he was also not not an elk” (Willerslev 2007:1, emphasis in original). Rather than presenting the hunter as occupying a position of liminality, which is a conventional approach in anthropology, he uses this story to challenge conventional categorical distinctions of animals versus humans, subjects versus objects, and nature versus culture. Willerslev thus explores the human–animal relation as a terrain of ambiguity, one in which what appear to be differences are systematically transcended by notions of similarity and identification. Thus, he positions himself within the broad body of literature that challenges dualist conceptions of nature (Cronon 1995a; Haraway 2008; Ingold 2000; Latour 2004; Pálsson 2009).

In a similar vein, we may infer from the cases presented in this volume that Pacific salmon can hardly be classified as simply “wild,” yet at the same time, its association with particular landscapes and seascapes implies that it cannot be said to be “*not* wild.” The trouble with “salmon as wild” rests not so much with the salmon as with the term *wild* and the corresponding notion of wilderness in Euro-American thought. William Cronon (1995a:69–70) has famously and somewhat ironically depicted the notion of wilderness as representing “an island in the polluted sea of urban-industrial modernity,” the last place where civilization “has not fully infected the earth.” According to Cronon (1995b), who is an environmental historian, the trouble with wilderness is not its nonhuman nature or the tracts of land and sea that it refers to, but rather that the concept “embodies a dualistic vision in which the human is entirely outside the natural.” Thus, it embodies a fantasy of people who never themselves had to work the land or sea to make a living. Cronon continues:

If we allow ourselves to believe that nature, to be true, must also be wild, then our very presence in nature represents its fall. The place where we are is the place where nature is not. If this is so—

if by definition wilderness leaves no place for human beings, save perhaps as contemplative sojourners enjoying their leisurely reverie in God's natural cathedral—then also by definition it can offer no solution to the environmental and other problems that confront us. To the extent that we celebrate wilderness as the measure with which we judge civilization, we reproduce the dualism that sets humanity and nature at opposite poles. We thereby leave ourselves little hope of discovering what an ethical, sustainable, honorable human place in nature might actually look like. [Cronon 1995b]

“Wild salmon” is a relatively recent concept. It has emerged as a way of differentiating farmed salmon raised in pens from the migratory salmon whose life cycle is less marked by human intervention (Lien and Law 2011). Thus, in an era when farmed Atlantic salmon flood the supermarkets and *Salmo domesticus* has greatly outnumbered its river-bound relatives, the notion of “wild salmon” is intuitively grasped as the salmon that is not farmed. The distinction helps differentiate phenomena that are in many ways dissimilar. The problem with the term *wild salmon*, however, is that it carries with it the dualism of humanity and nature as opposite poles, a dualism that has been challenged both ethnographically and philosophically (e.g., Ebert 2010; Latour 1993). The adjective *wild* thus portrays salmon as a species that has evolved completely independently of humans and will survive only as long as they are protected from human interference.<sup>5</sup> The problem with such assumptions is not only that they are wrong (Losey 2010; Menzies, chapter 8; Swanson 2009)<sup>6</sup> but, more importantly, that they leave us with few options to discover what sustainable human–salmon entanglements might look like.

One of the merits of the case studies presented in this collection is that they do exactly the opposite. More precisely, they demonstrate that even in areas where salmon would generally be classified by outsiders as wild (certainly not farmed), their movements and innate properties are still shaped and modified. Landscapes we tend to think of as “wilderness,” do indeed leave a place for humans whose lives and movements are similarly shaped and modified by the presence of salmon.

A striking example of such co-existence, if not co-evolution, is provided in Charles Menzies's (chapter 8) account of Gitxaala fishing practices on the Pacific coast of northern British Columbia. Menzies challenges the notion of terra nullius in arguing that the coastline that the Europeans encountered in the late 1700s was the “outcome of deliberate and direct

human–environment interaction over millennia,” but his argument goes further. Drawing on a wide range of ethnographic sources, he suggests that the Gitxaala, who still inhabit the region, had in fact purposefully managed salmon stocks in ways that are likely to have contributed to their increase or stabilization prior to European arrival. Traditionally, Gitxaala caught salmon with gaffs and stone traps and later by drag seining. In fact, specific boulder alignments currently being recorded in rivers document the ancient use of fish traps. According to Menzies, these gaffs and stone traps allow for the elective removal of fish, in relation to both specific creeks (runs) and individual salmon. Thus, the Gitxaala may have been able to target specific salmon as they returned and ensured that a sufficient number of healthy individuals had the chance to reproduce. The fishing gear employed was more labor intensive (gaff fishing involves selectively removing one fish at a time with a hook) but also more sophisticated than contemporary technologies that generally do not differentiate between juvenile and adult stock or between salmon from creeks that need protection and those that are less vulnerable. In other words, Gitxaala harvesting methods appear to have taken advantage of a nuanced understanding of salmon behavior and the ecology of various stocks. Menzies shows how fishing practices were embedded in a relational approach to nonhuman social beings in which an understanding of obligation and reciprocity was central. Human–salmon relations were kinlike, and ill treatment of salmon would cause them to leave (Losey 2009).

After about 150 years of European presence, this is exactly what happened. With the introduction of new production technologies such as canning and fishing gear that was both economically “efficient” and less sophisticated in the sense that it did not differentiate between types of salmon caught, the salmon stocks declined dramatically.<sup>7</sup> At the same time, with the introduction of processing technology and expanded possibilities for trade, (canned) salmon found its way to distant cities, which involved a dramatic and uneven upscaling of the human–salmon assemblage that could hardly be sustainable. Ironically, and following the decline in salmon stocks, Gitxaala fishing practices were essentially criminalized by Canadian authorities beginning in the 1880s.<sup>8</sup> Unraveling the complex entanglement of people and fish through such restrictions has, according to Menzies, contributed to the decline of both.<sup>9</sup> The Gitxaala account indicates how selective and careful harvesting represents a form of contact, a way of knowing, that in turn allows for the sustainable management of fish stocks.

A similar entanglement is found among the treaty tribes of the Columbia River basin, where there has been a dramatic decline of salmon

due to the introduction of hydropower dams and the greater harvesting pressures resulting from commercial opportunities that arose with the opening of the river to non-Indian settlers. Since the 1980s, numerous programs intended to protect Indigenous fishing rights have therefore simultaneously involved measures to enhance the salmon in the rivers through hatchery techniques (see Diver, chapter 10). An example is the Nez Perce, for whom the salmon are key to subsistence, kinship, trade, and commerce. In his chapter, Ben Colombi (chapter 9) describes how their efforts to recover and restore salmon involve the operation of several fish hatcheries, partly through partnerships with governmental institutions. In this case then, human involvement in salmon lives is taken a step further, in that it involves some control of the reproductive process, without which there would be very few salmon left. Salmon are thus involved in a process of sovereignty that in turn represents culturally specific solutions to broader environmental problems.

Inspired by the success of hatcheries in the Columbia River, Hokkaido (then a recently annexed part of Japan) opened its first full-fledged salmon hatchery in 1877 (Swanson 2009:80). But hatcheries were not unique to the Pacific Northwest. According to Greenberg (2010), records of human-controlled reproduction of Atlantic salmon from France are about six hundred years old. In Norway, publicly funded hatcheries were established in the mid-1800s as a response to a decline in Atlantic salmon stocks. By 1900, more than two million fry were produced by local Norwegian hatcheries, and a number of fish ladders were built to facilitate salmon runs (Treimo 2007). These interventions represent systematic efforts at cultivating salmon and suggest that domestication is indeed a gradual and ongoing process. Most importantly, we are reminded that humans and salmon intervened in each other's lives long before the most recent turn to intensive aquaculture on a massive scale.

Hatcheries sustain Alaska's salmon populations as well. The Alaska Department of Fish and Game stocks many millions of hatchery-raised fish to supplement the rivers in the southern part of the state. According to Greenberg (2010:59), nearly one in three so-called wild Alaskan salmon begins its life in a hatchery. And yet in spite of, or perhaps because of, such human interventions, Alaskan salmon is doing well compared, for example, with its cousins in the lower forty-eight. A hatchery could be considered a necessary "life support" or an "unnatural" intervention. However, the fact that a caught salmon may have been spawned in a hatchery does not prevent it from being classified as wild on the North American market. Furthermore, a distinction is often made between "conservation hatcheries"

and “production hatcheries,” which further emphasizes their distinct aims of supplying either the rivers or the aquaculture companies with salmon parr. The boundaries of “wildness” are, in other words, highly arbitrary, as well as culturally and historically specific, and the striking mobility and adaptability of salmon challenge whatever attempts we humans make to hold them in place.

In Norway, where hatcheries are primarily associated with aquaculture production and conservation hatcheries have a much less important role in the stocking of rivers than in the United States, the categories operate slightly differently. Where “life-supporting” hatchery practices do take place, such as in the once famous salmon river Vossovassdraget, a fin-clipped, hatchery-produced parr that is released in the river with the aim of re-establishing salmon is referred to as *forsøkslaks* (experimental salmon), not *villaks* (wild salmon) (Barlaup 2008). The term *villaks* refers only to those salmon originating from eggs fertilized “naturally” in the river, but again, boundaries are difficult to establish. When I asked whether the large salmon he had caught was wild or escaped farmed salmon, a young salmon fisherman who had grown up near the Hardangerfjord replied, “It depends on what you mean. I could spot a mark that indicates that it was vaccinated, and I could tell by the shape of its back that it was probably raised as a smolt at a production hatchery. But then it must have escaped early on, because the fins were perfectly alright, and not worn as they tend to be with farmed salmon. So it has spent most of its adult life out in the ocean with what you would call wild salmon” (interview with author, June 14, 2010).<sup>10</sup>

Escaped farmed salmon are seen as a serious threat to the self-sustaining salmon populations in Norwegian rivers, and the recent discovery that a third of all salmon caught in the Alta River were escapees (i.e., net-pen salmon raised for commercial purposes) from farms caused considerable worry. As a result of such concern in Norway in recent years, escaped farmed salmon have, somewhat controversially, been reclassified as alien species (Lien and Law 2011).<sup>11</sup> This example is yet another indication that the differentiations between “wild” and “not-wild,” “native” and “not-native” are done differently in different situations and socioenvironmental contexts.

As this book shows, salmon come in different forms in different places. Some were born in hatcheries, some were not. Rather than nurturing an image of salmon as wild, we should draw attention to the wide scope of possibilities available to humans and salmon and their entangled practices. Furthermore, we need to focus not only on the way hatcheries sustain salmon populations, but also on the ways in which the presence of salmon



sustains human populations and human networks on a broader scale. Let us turn to salmon as food.

### **SALMON TRAJECTORIES: SALMON AS FOOD, GIFT, AND COMMODITY**

“About the only sociable thing to do with food is to give it away” (Sahlins 1974:217). This statement is taken from Marshall Sahlins’s classic book *Stone Age Economics*, and the same could be said for salmon. As many of the preceding chapters demonstrate, salmon moves along networks of reciprocity that often defy Euro-American notions of individual property rights.

Saying that salmon are crucial to the Indigenous people on the western Pacific Rim is an understatement. Among the Itelmens in northern Kamchatka (maritime Koryaks), salmon constitutes life in so many ways that any simple analysis of household economics, nutrition, trade, or cultural identity would miss the complexity that characterizes human–salmon relations in this region. On the shores of Sakhalin, salmon fishing is crucial to Nivkh identity and subsistence practices (see Wilson, chapter 2). Dried salmon has traditionally been the main staple of people whose subsistence practices are now under pressure, even though the salmon of Kamchatka and Sakhalin is currently abundant. Eric Kasten (chapter 4) describes how dried salmon nurtures people as well as dogs in northern Kamchatka and thus allows movement in a region where the ground is covered by snow a great part of the year. Salmon feed people sharing households, as well as extended families. But salmon feed larger social networks, too. Maritime Koryaks supplied salmon and seal to the reindeer Koryaks, who supplied them with reindeer meat in return, in long-lasting barter relations (Kasten, chapter 4). Such relations resemble the reciprocal exchange between coastal and reindeer-herding Sámis in Norway, an institution also known as *verrde* (Kramvig 2006).

During the Soviet period, subsistence fishing continued in Kamchatka, but the socioeconomic unit was expanded to include the entire village *kolkhoz*. David Koester (chapter 3) sees this shift as a step toward alienation, bureaucratization, and rationalization. In order to meet the Soviet state requirements for accounting, salmon quantities were expressed as written numbers, which in turn reflected the *kolkhoz*’s relative success in producing “surpluses that could be directed into the stream of national Soviet production” (Koester, chapter 3; see also Sharakmatova, chapter 5). Koester notes how this introduction of numbers as a way of representing salmon foreshadowed a shift from description (of catch from particular villages)

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to prescription (of quotas for particular rivers), a shift that also relates to ways of knowing salmon. Accompanying the shift to numbers was a shift toward commoditization: instead of being a subsistence food and gift, distributed within known social networks, salmon soon became a product (smoked, dried, or salted) that could be sold and consumed in towns as far away as Moscow.

Across the Bering Strait, on the islands of southern Alaska, a similar shift toward commoditization took place with the establishment of cannery operations in the early twentieth century. Village settlements grew as the local demand for salmon rocketed, and the new industry linked the local population to a fluctuating global commodity market. But the dependence on global markets also caused vulnerability in a region where people's lives revolve around fish. Contrary to many accounts that portray Indigenous villagers merely as victims of globalizing forces, Katherine Reedy-Maschner (chapter 6) notes how the market economy has been embraced in the villages of the eastern Aleutian Islands. Rather than passively accepting the current conditions of vulnerability, the Aleuts "resist, transform, and incorporate political and economic influences all the time" (Reedy-Maschner, chapter 6). Salmon is central to these entangled livelihoods (Reedy-Maschner 2009:135)<sup>12</sup> as it is caught, eaten, sold, given away, or even transferred in the form of fishing permits when the need for cash is acute (see also Carothers, chapter 7).<sup>13</sup> Again, we see how salmon enters ever widening circuits of exchange, only some of which sustain the lives of Indigenous people.

Reedy-Maschner takes us through two fishing villages that may or may not remain viable settlements in the years to come. As in many other chapters of this volume, we hear of people who move, of old settlements that dwindle, and of new ones that emerge. These are villages that depend on the sea, rather than on the land, and on what is caught, rather than on what is grown. Embedded in nation-states that are founded on the idea of the successful cultivation of land, such nonagricultural settlements challenge our notion of what a settlement is and ought to be. How, for instance, should we think of resilience? Are opportunistic resettlements to follow salmon and the socioeconomic relations that this resettling enables (jobs in processing and export, for example) a sign of resilience or of vulnerability? Are villages with a stable population an indication of a prosperous and viable region? Or does stability signal a lack of flexibility? Emma Wilson (chapter 2) describes how the Nivkh people of Sakhalin were forced to move to new kolkhoz settlements when Soviet officials deemed their salmon livelihoods "nonprofitable." While the Nivkh people today recall these demographic upheavals as rather dramatic, Wilson argues that they

have adapted to such changes while retaining their close engagement with salmon. As Heather Swanson (2009) points out, the viable diversity that salmon have spawned around the Pacific Rim comes from dynamic connections and migration, not from isolation. Trained in anthropology and Indigenous studies, we tend to think of culture lost every time a village is deserted (see also Creed 2006). Trained in biological sciences and conservation biology, we tend to think of species lost every time a salmon run becomes extinct. But salmon, like people, are remarkably mobile.<sup>14</sup> Are we programmed to read catastrophic change into shifts that are perhaps better seen as flexible and resilient?

Raising these questions is not a way of arguing for a neoliberal ideal in which change is embraced as opportunity and therefore is essentially good. Clearly, as some of these chapters demonstrate, some changes do indeed have negative impacts, and the current state of both Indigenous people and salmon along the Pacific Rim is in many cases deeply problematic. The question then becomes, how do we identify the problems in a way that also acknowledges the diverse forms of co-evolution and entanglement that sustain both humans and salmon in their wider networks of reciprocity? How do we problematize the current situation without reproducing nostalgic images of timeless Indigenous settlements embedded in relations of profound ecological balance? How can we draw on the rich variety of human–salmon relations to imagine alternative futures?

Courtney Carothers (chapter 7), in her chapter about the Sugpiaq people of southern Alaska, reminds us that while the marine environment has always remained a core feature of people's lives on Kodiak Island, "the nature of the dependence on salmon has shifted over time." Over the last seven thousand years, they have used salmon to supplement a marine mammal diet, forge settlements along streams and lakes, and trade during the Russian conquest. Yet, salmon canneries constitute the historical core of communities in the eyes of villagers today. In other words, global trade and capitalization are part and parcel of how the Sugpiaq villagers see themselves and their salmon.

On Kodiak Island, as in other parts of Alaska, salmon not only constitutes a movement of food out of the region, it also attracts flows of people into the region. Waves of Scandinavian migration contributed to modernization of the fishing fleet in the twentieth century; waves of Asian, North African, and Mexican migrants fill the industrial factories today.<sup>15</sup> This influx of people to the canneries made the Sugpiat a minority in their homeland and undermined the sovereignty that had traditionally ensured local people access to salmon. Not only did fish become a scarce resource,

Indigenous fishing practices were temporarily banned around the turn of the twentieth century (as was also the case in Canada and in northern Norway). During the twentieth century, commercial and subsistence economies were increasingly entangled, and like the Aleuts farther east, the Kodiak islanders embraced the opportunities that the cannery industry brought about.

Carothers points to the individualization of fishing rights of the 1970s and the notion of limited entry as representing a fundamental shift of the local economy. The problem, she argues, is not change as such, but the ways in which hegemonies of science and of the market dramatically limit the scope for difference and thus for carving out alternative approaches to the socionatural environment. The recent economic disconnection of Sugpiaq communities from resources of the sea significantly limits their possibilities for participating in an economy that, she argues, is based on an image of humans as “isolated profit-maximizers” of what their surroundings may offer. The limited relevance of this model is vividly illustrated by the preceding chapters, too, which together provide a variety of accounts of people whose relations to salmon are far more complex than one of mere resource exploitation. The case of the Kodiak islanders indicates that the problem is not capital as such (canneries encouraged flexible fishing lifestyles, for example), but rather the ways in which it is accompanied by forms of governance that give rise to particular subjectivities, practices, and ontologies, while restricting others. It also reminds us that struggles over sea and land are embedded in historical contexts of colonial inequities and that struggles over salmon are no exception.

Colonial inequities are also played out in the shadows of an emerging market economy, as exemplified in Russia, where an urban demand for caviar among affluent Muscovites forges unsustainable salmon relations in Kamchatka and Sakhalin. Erich Kasten (chapter 4) describes how the high price of caviar underpins a lucrative trade that involves poachers who catch heaps of salmon just to extract the roe and then dump the remains along the riverbanks to rot. While decomposing salmon may facilitate marine nutrient redistribution (Helfield and Naiman 2001), the removal of roe disrupts the salmon reproduction cycle. Most importantly, such fishing practices dramatically disrupt the traditional Koryak notions of reciprocity in relation to salmon. Rather than being merely a resource to be exploited, the Koryak River is also a sacred place that should be treated with respect, which entails a respectful relation to salmon. As one woman put it: “You must never fish more fish than you are later able to prepare. You must think about how these fish are given to us” (Kasten, chapter 4; see also Sharakmatova, chapter 5; Koester, chapter 3).

What went wrong is not so much that salmon (or roe) found its way to people elsewhere, but rather that the terms of exchange involved in these journeys disembedded salmon from the relations of reciprocity (between the river and people) that constitute human–salmon assemblages in the local region. That Muscovite, rather than Koryak, notions of what a salmon is emerge as dominant even in Kamchatka relates, in turn, to issues of power and involve not only who gets access to certain resources (Indigenous people are poachers, too) but who gets to define what a salmon—and a river—is and how it should be treated. In other words, it relates to diverging salmon ontologies as well as diverging interests.<sup>16</sup>

How do we accommodate such ontological difference? How can we account for different ways of knowing salmon, different biosocial realities, without erasing that very difference (in practices and relations) through which such realities are enacted? These questions are crucial in a situation in which struggles need to be settled and policies will be made. Let us turn to questions of what salmon might be and the different practices through which it may be known and differentiated.

### KNOWING SALMON

How do we, as humans, *know* salmon? And how do we, as anthropologists, come to terms with the different ways that salmon are known? To what extent are the salmon of the Koryak, for example, so different from the salmon described by natural science that we may in fact think of them as different entities? Is our analysis of cultural difference premised on the notion “mononaturalism,” as Bruno Latour (2004:33) argues? Or do we allow a more radical epistemology in which other people’s ways of knowing nature are as valid as those of natural science, and if so, how do we do that?

While Traditional Ecological Knowledge is often viewed as insight that may supplement, confirm, or enhance scientific knowledge, but not challenge its very foundation, Helen Verran takes a different view. In her study of different fire practices (ways of making the bush burn) in Australian Arnhem land, she describes a workshop where aboriginal landowners and environmental scientists came together to learn from each other (Verran 2002). Acknowledging that both Yolngu Aborigines and scientific knowledge rely on specific performances or ways of mobilizing collective memory (science as written texts, tables, and graphs; Yolngu as song, dance, and design), she then proposes an analysis that respects these epistemic differences. Her analysis respects different knowledges as “real” rather than trying to reduce them to a universalizing Western metaphysics.

Verran notes, for example, how Yolngu firing practices mobilize *wānga*,

which she loosely translates to “people-places.” This term is an attempt to hold on to the Yolngu reality that people and place are in fact one entity, to express an imminent relationality that cannot be reduced to the entities of “people” or “places” as autonomous. Could a similar term be applied to describe the human–salmon nexus? Perhaps it would need to include rivers, too, such as a human–salmon–river assemblage that might even include manmade rock formations on the riverbed (Menzies, chapter 8) or particular forms of fishing gear? In the Koryak case, nonhuman spirits should probably be included, while on Kodiak Island, it might be difficult to conceive of human–salmon relations without including the presence of the cannery. The specific ways in which these entities hold together would obviously differ, and the extent of these assemblages would vary and be to some extent negotiable. What is at stake, I suggest, is not so much what to include but that we think of knowledge as an aspect of relations that are already established and premised on the techniques through which salmon become apparent and relevant to us. Hence, we cannot know the salmon of the Koryaks without taking notice of the relations of reciprocity through which their world is perceived (differentiating gift relations from other nonreciprocal relations, for example), just as we cannot know the salmon of a fish biologist without taking into the account the way science differentiates species, for example, as separable entities of the natural world.

Different epistemic worlds do not evolve in isolation. Koester’s (chapter 3) account of the written enumeration of salmon in the Soviet period may be seen as an example of the mechanisms through which one ontology gradually comes to replace, or encompass, another. Numbers, according to Verran (2012), are deeply embedded in and constitutive of the real. Hence, the calculation of numbers is also an act of politics, and the question becomes not only whether to do salmon as numbers (see also Lien 2007b; Lien and Law 2011), but also whose numbers to use, what to count, and what to leave out of the equation.

These dilemmas are dealt with in several of the chapters, and their relevance for policy and governance are illustrated in particular by Victoria Sharakhmatova (chapter 5). In her chapter on community development on the west coast of Kamchatka, she points out huge gaps in knowledge, not only in what is seen as a necessary basis for effective and sustainable nature management, but also between the different groups of people involved, from Indigenous peoples to global nongovernmental organizations. The dilemmas she reveals are instances of ontologies that rub up against one another, and in which no easy consensus can be achieved in relation to

what counts as relevant “data” or “truth” (Law 2008). Such dilemmas are also exemplified by Sibyl Diver (chapter 10) as she writes about the historical development of co-management in the Columbia River basin, where court decisions and printed records constitute paper trails of shifting policies and different ways of knowing salmon.

Diver’s description of conflicts over access to resources allow us, as readers, to notice these how different ways of knowing play out within the regulatory context, as in the dispute between tribal members and nontribal environmental agencies in relation, for example, to catch-and-release fishing. While catch-and-release fishing is commonly practiced and also promoted in North American rivers, tribal members around the Columbia River see fish as food and have little patience with recreational fishing and catch-and-release, which they look down on as “playing with the fish” (Diver, chapter 10). A similar view is held by Sámi fishermen in Tana (Ween n.d.), and also by many non-Sámi people in Norway, where both inland and coastal fishing have traditionally been crucial forms of food procurement. More recently, however, nature management institutions in Norway promote catch-and-release for conservation purposes, triggering disputes similar to those described by Diver. Such disputes suggest that what is important is not whether or not to look after the salmon, as Diver clearly shows, but rather what belongs, and what does not belong in the category of “salmon.” If salmon is known as food and gift and the act of catching it is a reflection of “the creator’s benevolence” (Diver, chapter 10), then catching salmon simply to let it go again disrupts the relations that constitute salmon. If, on the other hand, salmon is known as a distinct species, separate from humans, and each individual returning to the river is a reflection—or a prediction—of the viability of the local salmon stock of that particular river, then removing the salmon from its route to spawn simply to eat it disrupts the cycle that constitutes a healthy salmon river.

### **SALMON TEMPORALITIES: CONCLUDING REMARKS**

Humans and salmon are both migratory species with an amazing capacity to adapt, and to evolve, in their explorations of new habitats. In some instances, this capacity has brought us into close engagement with one other, and the preceding chapters elaborate some examples. Sometimes the relation is fragile and temporary, as in the case of some fishing practices. Sometimes it is cyclical and more enduring, as when rock structures, salmon ladders, waders, and simple hatchery tools such as buckets facilitate human–salmon encounters. These, in turn, have allowed the creation of long-term mutual relations of dependence but also of exploitation, loss,

and decline. However, the encounter has always remained somewhat unpredictable: while humans tend to attach themselves to a particular settlement infrastructure on shore, salmon travel lightly and do not always return to their spawning grounds, or even to the same river, when they are expected to. Thus, not until the invention of the marine net-pen technology of modern aquaculture did the relation tighten in the sense that the salmon, quite literally, stayed in place. This development facilitated another chapter in the biography of human–salmon encounters and, through the control of both reproduction and feed, another instance in human history of animal domestication.

The lessons to be learned from this collection are many. We have seen that humans and salmon together create particular biosocial configurations that contribute to shaping our collective future. We have seen that these may sustain particular ways of life and thus be beneficial to all, but also that they can get out of hand and become detrimental both to salmon and to people. We have also seen that while they share similarities, each biosocial configuration is also unique, and lessons from one part of the world do not necessarily travel easily to another. Finally, we have seen that with each way of “doing salmon,” with each set of relations and the practices and technologies that underpin them, comes another way of knowing salmon. While salmon remains in some sense elusive, and our (human) knowledge is always somewhat incomplete, knowledge also rests in particular places, with particular people, and with the particular strains of migrating salmon that *they* know.

Presented with such diversity, we should treat with caution any claim about how to best deal with the challenges that the salmon–human nexus poses. Sustainable biosocial configurations of salmon and humans may—or may not—involve hatcheries, money, trade, canneries, cosmologies, science, net pens, or a notion of the wild. This is not to say that anything goes, but that the future of human–salmon relations is open-ended. Chapters of our story together are being written every day and perhaps with an even greater intensity and diversity than ever before. What we can do now is share some of these stories and use them as templates for imagining a rich variety of alternative futures, uniquely adapted to the particular ways in which our human–salmon habitats evolve.

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All scientific work is collaborative, but some papers rely more on collaboration than others. As a native of the Atlantic Rim studying Atlantic salmon, I am deeply grateful for the invitation to take part in discussions about Pacific salmon, species that I



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### Notes

1. The total global production of farmed Atlantic salmon in 2010 was 1.46 million tons. Sixty-five percent of the total production takes place in Norway where the production has more than doubled since 2001 ([laksefakta.no/nokkelinfo.html](http://laksefakta.no/nokkelinfo.html), accessed April 2, 2011).
2. The term “*Salmo domesticus*” is derived from Gross 1998.
3. Most salmon counts rely on salmon returning to rivers to spawn. The number of salmon out at sea is, of course, far more difficult to pin down, and thus the “scientific salmon” is in large part a fish in the river.
4. I wish to thank Sibyl Diver for pointing this out.
5. I do not claim that salmon caught in a river and salmon raised in a net pen are identical or that the way they are often distinguished makes no sense. I wish to emphasize, however, that the boundary thus established rests upon fundamental divisions, both in popular discourse (wild versus not wild) and in anthropology (the human versus the nonhuman realm), that are neither self-evident nor particularly helpful.
6. Heather Swanson points out how the remarkable adaptability of salmon has made them specialists in the art of adapting to particularities, thus indicating a co-evolution with humans.
7. “Efficient” in terms of economic calculations of labor investment versus catch output, measured in the short term. This is a way of modeling that, in itself, represented a “new technology” in the human–salmon assemblage of the Pacific Northwest.
8. Weir-based fisheries were used by non-Indians as well and had the capacity to be incredibly efficient. Unless they were managed carefully (as they were in precolonial times, when some salmon were allowed to move up the river), one could catch the entire run at a single weir. Thus, they were potentially highly efficient, even before the arrival of Europeans.

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9. A similar criminalization of Indigenous fishing practices took place in Norway in the Tana River where Sámi fishing practices were made illegal (see Ween 2012).

10. This interview, and the analysis of the case of “Vossolaks” is part of the ethnographic material in the project “Newcomers to the Farm: Atlantic Salmon between the Wild and the Industrial,” funded by the Norwegian Research Council. I am indebted to Line Dalheim for pointing out the difference between “wild” and “experimental” salmon.

11. They have been reclassified in spite of the fact that they are offspring of Atlantic salmon stock that was taken from Norwegian rivers some seven to eight generations ago. In the meantime, selective breeding has changed certain characteristics, particularly related to appetite and growth rate. Genetic modification is not practiced in Norwegian aquaculture.

12. “Entangled livelihoods” was coined by Reedy-Maschner to describe the particular coastal village economy characteristic of the southern Alaskan region (see also Carothers, chapter 7).

13. Salmon fishing permits may be transferred temporarily or permanently between friends or kin (with the assumption that the transfer will be compensated by a hired position or other community favors) or sold for cash. People without permits can still fish for subsistence, but this is more difficult without commercial equipment. I wish to thank Kathy Reedy-Maschner for pointing this out.

14. Heather Swanson further suggests that North Americans’ impression that salmon is “gone” is a reflection not so much of the salmon’s disappearance as of its redistribution throughout the North Pacific. She describes how in the mid-1990s, for example, the US government declared the fisheries of the Columbia River region an “ecological disaster,” and salmon populations were seen as endangered (see also Smith and Gildea 2000:6), while Japanese fishermen in Hokkaido hauled in fifty-seven million chum salmon, an all-time record (Swanson 2009:79).

15. The overwhelming majority of cannery workers are immigrants from the Philippines, Mexico, and North Africa. The first major group was made up of Filipinos recruited after American military occupation in the 1930s. Subsequently, when migrant labor laws were relaxed, recruitment moved to Mexico and elsewhere. I wish to thank Kathy Reedy-Maschner for elaborating this point.

16. By “diverging salmon ontologies,” I refer to the way in which order is generated through practices that involve both humans and nonhumans. It is a way of stating that the world is not a single order in which difference is merely a question of interpretations and diverging interests. This approach, which sees reality as a relational effect, involves a turn from questions of epistemology to questions of ontology (Abram and Lien 2011:8; Lien and Law in press; see also Mol 2002).