FACETS
a multidisciplinary open access science journal

RESEARCH ARTICLE

"From the beginning of time": The colonial reconfiguration of native habitats and Indigenous resource practices on the British Columbia Coast

Chief Adam Dick (Kwaxsistalla Wathl'thla)[a], Daisy Sewid-Smith (Mayanilth)[b], Kim Recalma-Clutesi (Oqwilowgwa)[c], Douglas Deur (Moxmowisa)[d], and N.J. Turner (Galitsimġa)[e]

[a]Kwakwaka'wakw Nation, British Columbia, Canada; [b]Kwakwaka'wakw Nation, Quinsum, British Columbia, Canada; [c]Kwakwaka'wakw/Pentlatch Nation, Qualicum, British Columbia, Canada; [d]Department of Anthropology, Portland State University, Portland, OR 97207-0751, USA and Kwakwaka'wakw Nation, British Columbia, Canada; [e]Emeritus Professor, School of Environmental Studies, University of Victoria, Victoria, BC V8W 2Y2, and Kwakwaka'wakw Nation, British Columbia, Canada

*nturner@uvic.ca

Citation: Dick A (Kwaxsistalla Wathl'thla), Sewid-Smith D (Mayanilth), Recalma-Clutesi K (Oqwilowgwa), Deur D (Moxmowisa), and Turner NJ (Galitsimġa). 2022. "From the beginning of time": The colonial reconfiguration of native habitats and Indigenous resource practices on the British Columbia Coast. FACETS 7: 543–570. doi:10.1139/facets-2021-0092

Handling Editor: Jesse Popp

Received: June 30, 2021

Accepted: December 6, 2021

Published: April 14, 2022

Note: This paper is part of a collection titled "Ărramăt, the intersections of biodiversity conservation and Indigenous health and well-being".

Published by: Canadian Science Publishing

Abstract

Indigenous Peoples' lives, cultures, and values are defined largely by their long-term relationships with the lands, waters, and lifeforms of their territories. Their stories, names, ceremonies, and connections with the plants and animals on which they have depended over countless generations are cornerstones of their knowledge systems, systems of governance and decision-making, traditions of intergenerational knowledge transmission, and values and responsibilities associated with natural and human domains alike. For First Nations of North America's Northwest Coast, as for many other Indigenous Peoples, the arrival of European newcomers disrupted both the natural world and associated cultural practices in interconnected ways. The industrial exploitation of lands and resources had wide-ranging effects: traditional land and resource appropriation; impacts on culturally significant habitats by industrial-scale fishing, logging, and mining; and discrimination and marginalization contributing to resource alienation. This paper documents some experiences of Kwakwaka'wakw and other Coastal First Nations in coping with the cultural effects of environmental loss. It highlights their concern for the ecological integrity of lands and waters formerly under their stewardship but reshaped by non-Native extractive economies, and describes how these losses have affected the cultural, social, and physical health of Kwakwaka'wakw peoples up to the present time.

Key words: environmental loss, Indigenous stewardship, cultural survival, Kwakwaka'wakw, Northwest Coast

Introduction

> ***"Hillatussella*** [the Transformer] . . . came from the north. He came to ***x^{w}essam*** [Kelsey Bay, northeastern Vancouver Island]. He saw ladies taking ***t'ə$\underline{x}^{w}$sús*** [springbank clover rhizomes] on the flats. And they couldn't see, these ladies [for they were blind]. And the other lady said,

> sniffing… 'It smells like ***Q'aniqilak^{w}*** [the Transformer[1]]'… these ladies digging ***t'ə$\underline{x}^{w}$sús*** [said]… He said to them, … 'Are you all blind?' And one lady said, 'Yes, we can't see, but we can smell and feel.' And he said, 'Come over here where I'm standing.' And they said, 'We can smell you.' So he grabbed these ladies and made mallards out of them. He turned them into mallards. And that's why these mallards like to have ***t'ə$\underline{x}^{w}$sús***! That's what they look for on the [tidal] flats. Yeah, he turned them into a mallard [duck]… ***lhalhk'uw***, we call it. And you see, they're all digging around the flats, for ***t'ə$\underline{x}^{w}$sús***" (Kwakwa$\underline{k}$a'wakw story told by clan Chief Adam Dick, Kwaxsistalla, December 2001).

The oral traditions of Northwest Coast Indigenous Peoples, such as the story recounted above, bind the people to their resident places, embodying their long-term relationships with the lands, waters, and lifeforms of their home environments. Ancestral names, such as ***Kwaxsistalla***, reflect ties to people's traditional territories and to their cultural and ecological heritage. Kwaxsistalla is the Kwak'wala name bestowed upon Adam Dick as part of his hereditary chieftainship of the Dzawada'enuxw (Tsawataineuk) people of Kingcome Inlet (Gwa'yi village). Adam Dick's grandfather and great grandfather held the name Kwaxsistalla, as did a long chiefly line before them. As Adam explained in 1998, "Oh, there used to be hundreds of Kwaxsistalla's before they gave me that name."

It was the duty and prerogative of leaders with the name Kwaxsistalla to serve as guardians of the eulachon—a small, oily smelt called ***d^{z}ax^{w}x^{w}en*** (*Thaleichtys pacificus*)—when they came up the Kingcome River to spawn. Every spring, for probably thousands of years, immense numbers of these fish swam up the Kingcome and other coastal rivers to deposit their spawn along gravelly shallows on the lower part of the channel as far up as the tide penetrates. People captured the eulachon in nets after they had spawned and were returning downriver, and through a complex process, rendered them into a rich and nutritious oil called ***t'inna*** (grease), a food and condiment still highly regarded. Before anyone was allowed to catch eulachon, Kwaxsistalla patrolled the river and made sure the fish had spawned in sufficient numbers to ensure its survival. Adam Dick compared the role of Kwaxsistalla to that of a fish warden: "Nobody touches the eulachon until he says okay."

To this day, First Nations in British Columbia identify strongly with their ancestral lands and resources. However, their situation has changed drastically since the times of earlier Kwaxsistallas, before the arrival of colonists; modern First Nations still navigate a legacy of discrimination and marginalization and appropriation of resources extending back to colonial times and arguably still present today. In a conversation that initiated this paper and from which the title is drawn, Adam Dick described the situation:

> "We even have to sneak when we go get cedar bark now, if you're outside the reserve…. They say Canada's a free country. It's not free anymore. You have to watch what you're doing now…. I have to go and get a permit to go and kill a deer for a family…. You can't dig clams any more… you have to go to the fisheries [the federal offices of Fisheries and Oceans Canada] and they give you a $50.00 license…. It's way getting out of hand now, how they treat us. … We can't find big enough trees now to make a decent canoe…. And we can't go out there and harvest ***dənnas*** [cedarbark] anymore…. Look at the clams and look at the crabs and the salmon! You know, the salmon was given to us by the Creator *from the beginning of time*…" (Clan Chief Adam Dick, interview with Douglas Deur (DD) and Nancy Turner (NT), 2000).

[1]Daisy Sewid-Smith notes that the Transformer had two names. The first is ***Hillatussella*** [***Hilla*** = "to correct"; and ***tussella*** "coming down (North to South)]". His name means "the one who corrects what is wrong. His other name is ***Q'aniqilak^{w}*** [***Q'ani*** = when a bird spreads its wing; and ***qilak^{w}*** = "clothing"]; his garment looked like a bird spreading its wing.

These circumstances have profound implications for the cultural and economic survival of First Peoples and are compounded by environmental loss and damage from industrialization and urbanization[2].

In this article, we argue that industrial and commercial exploitation of key culturally significant habitats and resources of coastal British Columbia has served to curtail and in some cases, eliminate longstanding traditions of Indigenous resource use and management that were inextricably tied to these habitats. In turn, this process of suppression has had repercussions for the cultural and physical well-being of First Nations peoples, as well as the long-term ecological integrity of the lands and waters formerly under their stewardship. Traditional plant resources and their habitats receive particular attention in our discussion. Though they are seldom considered in general treatments of historical, environmental, and cultural change, they are central to Indigenous resource practices and technologies, and are representative of broader patterns seen among other classes of resources (Turner 2014, 2020a, 2020b; Turner and Lepofsky 2013).

This paper is one of many contributions resulting from the authors' long-term collaborations in documenting and highlighting the knowledge, experiences, and wisdom of *Kwaxsistalla Wathl'thla*, *Mayanilth*, and *Ogwilogwa*, and demonstrating the importance and relevance of their contributions to biocultural conservation and diversity (see, for example, Sewid-Smith and Turner 1998; Sewid-Smith et al. 1998; Deur and Turner 2005; Deur et al. 2013, 2015; Deur, Recalma-Clutesi and White 2020; Deur, Recalma-Clutesi and Dick 2020; Turner 2020a). Many others, including our colleague Dana Lepofsky and our graduate students, have participated in this research and learning collective, which we have affectionately called "Adam's school," as a tribute to our esteem and appreciation for *Kwaxsistalla*'s teachings. All of this work has been done under the standard requirements of research ethics, approved through the University of Victoria's Human Research Ethics Board, as well as by the participating Ninogad (Kwakwaka'wakw knowledge holders and leaders). It has included a range of different research approaches: experiential learning, focused recorded interviews, storytelling, field-based experiments and replication of traditional management practices, photography, and participation in ceremonies, traditional cooking events, and field expeditions.

Our work presented in this article is thus rooted first and foremost in the knowledge of specially trained nobility of the Kwakwaka'wakw world. The late Clan Chief Kwaxsistalla Adam Dick, born in 1929 into the Qawadiliqalla Clan of Dzawada'enuxw Kwakwaka'wakw, was hidden from the residential school system as a child and specially trained by the Clan Chiefs of his childhood, being ordained as a unique conduit of traditional cultural knowledge into our present times. Although he passed away in 2018, leaving his Chief's position to the succeeding generation, his contributions to our ongoing work have been immense, as have those of his dear friend *Mayanilth* (Dr. Daisy Sewid-Smith) and his partner *Oqwilowgwa* (Kim Recalma-Clutesi), both experienced knowledge holders and cultural experts who received highly specialized training in social, economic, ceremonial, and other dimensions of Kwakwaka'wakw tradition. Together, their impacts have been transformative, informing previously poorly documented or understood traditional management practices such as clam gardens and intertidal root gardens, now widely recognized thanks to the willingness of these Ninogaad (knowledge holders) to share their knowledge and experiences with a generation of students and researchers. It is to acknowledge their unique authority in these domains and their singular contributions to the research presented here that we name them as the lead authors of the present article.

We draw on their oral accounts but also historical sources to reconstruct a picture of earlier Indigenous cultures and the approaches and methods used to steward their resources. We center

[2]See also the paper by Mustonen et al. (2021) in this collection; there are strong connections between their findings and what we present here.

our discussion on the Kwakwaka'wakw (formerly "Kwakiutl") and neighbouring Coast Salish of British Columbia. Focusing on cultural–environmental linkages, we then discuss the direct and indirect environmental impacts of the European newcomers on Indigenous Peoples' lifeways. In many cases, it is the very same habitats—including the tidal flats of the mallard duck women in the introductory story and the river shoreline guarded by generations of ***Kwaxsistalla***s—that were sought out, appropriated, and drastically modified by the Europeans, effectively changing the nature of these places and making them unavailable to Indigenous users. The current status of coastal First Peoples and the impact of these historical changes on their contemporary rights to and control of their traditional lands and resources are discussed next. Finally, we briefly assess hopeful trends that might reverse both the ecological effects of the colonial experiment and the adverse impacts upon Indigenous Peoples' tenure and management of habitats within coastal British Columbia.

Ethics and positionality statement

The authors of this article are members of the Kwakwaka'wakw community and operate within the system of rights and intellectual property rules overseen by the clan chieftainships since time immemorial. In life, the lead author Clan Chief Adam Dick (Kwaxsistalla) was the Chief of the Kawadillikalla Clan of Dzawatainuk Tribe of the Kwakwaka'wakw Nation in British Columbia, Canada; in the final decades of his life, he was among the foremost authority on chiefly knowledge and prerogatives within the Kwakwaka'wakw world. He held undisputed authority within the domain of Kwakwaka'wakw traditional law to share his chiefly knowledge with the public, at his discretion; he instructed the authors to produce this article and participated in its writing prior to his death. As he is now deceased, we refer to him as Kwaxsistalla Wathl'thla—meaning that he is the man who held that chiefly name in life; his son now holds the title and duties of Kwaxsistalla and serves as the living Clan Chief to the Kawadillikalla. The late Chief Adam Dick's sister is coauthor Daisy Sewid-Smith (*Mayanilth*), also a Kwakwaka'wakw noble; an accomplished author, she is the daughter of Clan Chief James Sewid and served as his assistant and "potlatch recorder" until his death. The late Chief Kwaxistalla's life partner, Kim Recalma-Clutesi, is also a Kwakwaka'wakw noble and coauthor of this article; she is the daughter, cultural assistant, and potlatch recorder to Chief Ewanuxdzi, the late Buddy Recalma, and sister and cultural advisor to the current Chief Klaqwagila, Mark Recalma. A writer and film director, she is heir and curator of Chief Kwaxsistalla's recorded works, and assists the living Chief Kwaxsisalla in cultural domains. The late Clan Chief Kwaxsistalla was as family to professors Drs. Nancy Turner and Douglas Deur and adopted both into the Kawadillikalla Clan in a Kwakwaka'wakw public feast in Kingcome Village; both work with Kwakwaka'wakw Traditional Knowledge only under the direction of the Clan Chiefs and within the parameters of Kwakwaka'wakw law pertaining to cultural and intellectual property. Both Turner and Deur are ethnobiologists—Turner of exclusively European ancestry, Deur of predominantly European ancestry—who have dedicated their research careers to building relationships with Indigenous communities in North America and carrying out community-based research in respectful and reciprocal ways. Dr. Turner carried out a portion of this work in under IRB # 13-179 at the University of Victoria.

Precontact relationships between humans and the land

> "I always say we were the richest people in the world. I'm not talking about money, but everything that we had before. We just go down the beach and get a bucketful of clams, just enough for dinner, like that. And we can't do this anymore. We haven't got it anymore. Now we're really poor." (Clan Chief Adam Dick, perssonal communication to DD and NT, 2000.)

> "Our survival depended on the sea, the rivers, lakes. We completely depended on nature. The garments that we had, the houses that sheltered us, the foods we ate, the medicines we had—nature supplied it. And that is the reason why we respected nature as we did. ....

> Mother Nature does not want you to take from her and not put anything back.... Nature will not survive if we just keep taking. ... We [today] have to own things. And that was the problem we had when the Europeans first came. When the Europeans first came over, [everything was] divided up as being someone's property. And we didn't really appreciate that" (Daisy Sewid-Smith, address to Helping the Land Heal Conference, Victoria, BC, November 1998).
>
> "No money long ago, but it's nice: lots of food, lots of clams, lots of wild berries all over... even they are gone.... We lost everything. Nothin' [left]!" (Elsie Claxton, Tsawout, WSÁNEĆ Nation, Coast Salish, personal communication to NT, 1998).

When the first Europeans arrived in the region now known as British Columbia, around 1770, hundreds of Indigenous villages were situated along the coast, the geographical focus of this article. Sixteen major languages, within four language families, were spoken by the coastal peoples of British Columbia, some with multiple dialects. Archaeologists estimate the time depth of human occupation in the region to be at least 14,000 years, and probably longer (Ames and Maschner 1999; Kirk and Daugherty 2007; Mackie et al. 2011; Turner 2014; Fedje et al. 2018). Before major epidemics decimated villages up and down the coast, the Aboriginal population was no fewer than 182,000 people according to conservative estimates—though population numbers may have reached 250,000 or higher (Suttles and Ames 1997; Cybulski 2007; Muckle 2007). The lands and waters of the coastal region provided the people with hundreds of food items, both plant and animal, innumerable medicines to treat ailments and injuries and help people maintain their health, and dozens of different types of materials for their technologies (Turner 1995, 1998, 2014; Turner and Chambers 2006).

These resources are not distributed ubiquitously over the landscape. Rather, they occur discontinuously, in specific habitats—in forests, meadows, wetlands, shorelines, and in aquatic and marine environments—and at specific times, within peoples' traditional territories. Most people had access to these localities and resources, either within their own territories or through exchanges and social networking with other communities occupying distinct environments (Suttles 1968a, 1968b; Turner and Loewen 1998; Atleo 2004, 2011; Turner et al. 2005; Turner 2014). In the winter months, people stayed in permanent villages, invariably situated along the coastline or at the edges of rivers and lakes (Turner et al. 2003). Then during the growing season, starting around early March, they traveled over their territories to access resources from different habitats, in a predictable, patterned, seasonal round. Typically small groups of extended families or clans traveled together, camping at key locations for fishing, clam-digging, root-digging, berry-picking, bark-gathering, hunting, and other types of resource procurement and processing, sometimes staying for weeks in one place then moving on to others as the season progressed. The products of the seasonal harvest were eventually brought back, and dried or otherwise processed, to the winter village for storage and later use. Products and materials that were available over and above what a family needed for survival were used for gifts or trade within and between communities. Surplus foods were prepared and served at feasts and potlatches where relatives and neighbouring peoples were invited to witness ceremonial and cultural events and given foods and other items as tribute for their participation. These extra foods and other harvested and manufactured products were critically important in strengthening social networks and reciprocal relationships that helped build resilience: a family's or community's ability to survive through times of shortage (Suttles 1987; Ommer and Turner 2004; Turner 2014; Deur, Recalma-Clutesi and Dick 2020).

This is not to say that there were not times of scarcity and hardship. Sometimes, especially in the early spring, the first runs of salmon might be delayed, with no game present, and people had to rely on alternative resources and starvation foods, especially sedentary and predictably located resources such as clam beds and root grounds (Kennedy and Bouchard 1983; Turner and Davis 1993; Minnis 2021). On some rare occasions, the salmon did not return at all, and people were forced to relocate.

Occasions of conflict and warfare over disputed land and resources sometimes transpired. In general, however, most people up and down the coast lived relatively well. The traditional diet, including a wide array of plant foods (seaweeds, greens, root vegetables, inner bark of trees, and berries), provided them with a full range of essential nutrients and dietary diversity (Kuhnlein and Turner 2020). The archaeological record reveals little evidence of malnutrition and related illnesses (Cybulski 1990, 2007). Peoples' social and ceremonial traditions were structured around cycles of resource procurement, movement between habitats, and the sharing and redistribution of resource wealth. Their rich compendia of narratives, dances, songs, and artworks are a testament to the intimacy and intricacy of the relationships between specific peoples and resource sites within their territories.

Certainly, coastal environments have changed dramatically over the millennia due to factors such as climate change and changes in sea level (Hebda and Whitlock 1997; Turner and Clifton 2009). Yet almost always, change has proceeded at a pace not impairing the availability of plant and animal species for human use. Moreover, human exploitation appears to have had few adverse impacts upon resource availability on the precolonial British Columbia coast. For example, in the case of shellfish use, archaeological evidence shows that though tremendous quantities were harvested, shellfish were not depleted and the management patterns and practices of coastal peoples ensured their sustainability (Hebda and Frederick 1990; Mathews and Turner 2017; Thompson et al. 2020). This was also evidently the case for salmon resources (Thornton et al. 2015).

Similar arguments can be made for sustainable use of plants. Large quantities of plant resources, from edible roots and greens to cedar bark and other tree products, were extracted continuously and intensively. Yet, the plant populations were not only maintained, but often enhanced, through a variety of approaches and strategies undergirded by philosophies and worldviews consistent with conservation (Deur and Turner 2005; Turner et al. 2013, 2021). First Peoples used methods such as the tilling, weeding, and selective harvesting of plots of clover (*Trifolium wormskioldii*) and silverweed (*Potentilla egedii*) roots, or the burning of berry patches and pruning of the bushes, to ensure their continued output at levels required to feed large communities proximate to these enhanced environments. People regularly burned meadows and other clearings to produce meadows of edible camas (especially *Camassia quamash*), as well as burning and pruning individual bushes. Regular burning not only enhanced the growth of camas, but also produced the meadow habitats optimal for foraging deer and elk, providing predictably productive hunting sites (Boyd 1999; Deur and Turner 2005; Turner and Peacock 2005; Lutz 2020). Likewise, families sometimes enhanced clam beaches through the removal of rocks and debris, producing what are commonly termed "clam gardens" (Recalma-Clutesi 2008; Groesbeck et al. 2014; Deur et al. 2015; Mathews and Turner 2017); Chiefs and their delegates regulated fish harvests to avoid overexploitation in traditional settings (McIlwraith 1948; Jones 2002; Thornton et al. 2015). Many types of plants were transplanted to different locales (Turner et al. 2021), and some accounts suggest that communities transported salmon smolts and eggs to depleted streams (George 2003; Turner 2020b). If people detected signs of scarcity, or even the hint of overexploitation, they would take measures to reduce their impact until the resources recovered:

> "... Sometimes something would happen where a certain plant won't grow as much as it did last year. And they said it's a cycle that happens—fish will disappear and there won't be very much fish.... And, when they could see that there was going to be scarcity, then they were not allowed to go to that particular area. They were told by the Chiefs to go to another area, and let that area build up" (Daisy Sewid-Smith, personal communication to NT, 1997).

Several lines of evidence suggest that these are practices of considerable antiquity on the British Columbia coast—from archaeological features associated with resource harvest sites from centuries ago, to linguistic evidence of traditional resource cultivation techniques, to the existence of specialized

tools and technologies specific to the harvest, to the songs and stories mentioning these practices once widespread along this coast (Deur and Turner 2005; Turner 2014).

Oral accounts by First Peoples suggest that these actions were undertaken not only to mechanically enhance resources, but also to "show respect" for resources and the spiritual forces that regulated their output. If the species and habitats were honoured through acts of management, they would—as sentient actors on the landscape—reciprocate to their human caretakers. While ethnographic accounts suggest these enhancement methods, applied to specific habitats, required regular inputs of labour, this labour was amply rewarded by predictably abundant concentrations of foods and other natural resources (Turner and Jones 2000; Deur and Turner 2005; Turner and Peacock 2005).

The resulting landscape, with its combination of natural abundance and enhanced environments, is recalled in First Peoples' oral traditions as being the outcomes of purposive action and the spiritual forces that influenced natural phenomena:

> "... There was clean water, clean beaches, dense first growth forests, crystal clear lakes, streams, rivers teaming with fish of all kinds. Huge herds of deer, elk and flocks of ducks would blot out the sun. Beaches full of crabs, clams, sea urchins, were there for the taking and much more. These are the gifts of XALS, Our Creator.... All of this and the freedom to roam over the land and the sea, created a bountiful and honourable way of life, not wanting or needing for anything more. It was a virtual paradise right here in Saanich for hundreds and hundreds of years" (Claxton and Elliott 1994, p. 49; WSÁNEĆ Nation, Coast Salish).

The newcomers and their impacts

European newcomers were not familiar with the resource stewardship traditions that long characterized human–environment relationships in this region. The first Europeans to arrive on the Northwest Coast saw only a vast wilderness, ripe for harvest: immense forests against a backdrop of mountains, deep inlets with plentiful fish and wildlife, and a wide variety of interesting and useful vegetation, features remarked upon on many occasions (Moziño 1970; Turner 1978, 2014; Harris 1997, 2002). For example, off Estevan Point on the West Coast of Vancouver Island, Captain James Cook reported, "The valleys and the coast were covered with tall straight trees that formed a beautiful prospect, as of one vast forest" (Scholefield 1914, p. 80). Others, such as James Douglas (1843, in Glazebrook 1938, p. 20) characterized most of the coast as "a dreary wilderness," while extolling on what is now Victoria as "a perfect Eden," barely mentioning the inhabitants. He and his contemporaries scarcely realized that the oak savannahs lending Victoria its Edenic qualities were, in part, the outcome of repeated burning and other forms of anthropogenic landscape modification (Lutz 2020).

The European chroniclers did little to conceal their ethnocentric views of Indigenous inhabitants. At best, some regarded Indigenous Peoples as "children of the forest" (term of James Douglas, cited in Fisher (1977, p. 62), letter of Douglas to Barclay, 3 September 1849, HBCA, A11/72), and at worst, others regarded them as "savages," living in filth and indolence (Seemann 1846 in Scholefield (1914, p. 483); Turner (2020a)). Few of the newcomers recognized the sophistication with which the First Peoples managed their environment and resources or the importance of their traditional foods and lifeways to health and well-being. Few could have understood the richness and complexity of Indigenous knowledge systems or the subtleties of their resource stewardship.

The situation on southern Vancouver Island is in some ways representative of what happened, to a greater or lesser extent, all along the coast. Fort Victoria was established as a Hudson's Bay Company (HBC) Trading Post in 1845, with James Douglas as Factor, and shortly after, the new Governor for the Colony of Vancouver Island. In July 1842, Douglas was ecstatic with his initial

survey. Unwittingly observing what were apparently anthropogenic environments, he noted, with the prospective of future agriculture in mind:

> "Both Kinds [of soil], however, produce Abundance of Grass, and several varieties of Red Clover grow on the rich moist Bottoms.... In Two Places particularly, we saw several Acres of Clover growing with a Luxuriance and Compactness more resembling the close Sward of a well-managed Lea that the Produce of an uncultivated Waste.... Being pretty well assured of the Capabilities of the Soil as respects the Purposes of Agriculture, the Climate being also mild and pleasant, we ought to be able to grow every Kind of Grain Raised in England..." (Scholefield (1914, p. 463) quoting from Douglas's report, Fort Vancouver, 12 July 1842).

Barely four years after Douglas' initial description of the Victoria area, in June, 1846, naturalist Berhold Seeman wrote of the inner harbour area, first remarking on the "natural park" with "noble oaks and ferns... in greatest luxuriance," extolling the conversions of the land to "civilization" (Seemann (27 June 1846), quoted by Scholefield (1914, p. 483). Two years later, in September 1848, Captain Courtenay wrote in a letter about Victoria, celebrating the abundance of the oak savannah landscape: "The country abounds with Elk, Deer & other game besides all the Fur animals" (Scholefield 1914: 380). He also noted that in the few short years since the HBC had established its fort, "The Company have 300 acres under tillage there, and a dairy farm of 80 Cows, together with numerous other cattle & 24 brood Mares.... They are likewise building a Saw Mill at the head of Port Esquimault" (Captain Courtenay, on board H.N.S. *Constance* "at sea" 12 September 1848 to Mr. Wil. Miller, British Consul at the Sandwich Islands (Scholefield 1914, p. 380)). Furthermore, he wrote glowingly,

> "There appears to be a great deal of excellent Land in Vancouver Island, & the Coast abounds with good harbours.... The winters are mild; never so severe as to interrupt agricultural pursuits, & they have never failed to gather in their crops at Fort Victoria in the month of August while the extensive Prairies afford pasture for innumerable herds of Cattle."

There was also noted a stream emptying into Victoria Harbour, in which there were "a considerable Quantity of Salmon caught annually...." (Scholefield 1914, p. 461). Everywhere, anthropogenic landscapes were assessed in this fashion, in anticipation of their value for conversion to crops, with the assumption that European agriculture represented the highest use to which the land could be put (Harris 1997; Lutz 2020). These descriptions, and dozens like them were, ironically, the harbingers of accelerating colonization, a process of textual and geographical displacement of the Aboriginal population that some have considered tantamount to "genocide" (Duff 1964; Fisher 1977; Sewid-Smith 1979; Claxton and Elliott 1994; Cole and Chaikin 1995; Arnett, 1999).

Clearly, the lands and waters around the Victoria area, so coveted by the newcomers, already had occupants: the Lekwungen, W̱SÁNEĆ (Saanich), and other Coast Salish Peoples (Suttles 1951). These people had utilized and often maintained the very habitats that were most sought by colonialists. The habitats of southern Vancouver Island had been shaped, intentionally and unintentionally, by its original occupants over countless generations of burning, clearing, and selective harvesting; the active maintenance of grasslands, camas beds, clam beds and open woodlands for the purpose of enhancing root and berry production; and the traditional management of fisheries and game foraging areas (Suttles 1951; Turner 1999; Deur and Turner 2005; Turner and Peacock 2005). Meadows burned to foster production of camas and forage for deer were among the first places occupied by the agricultural operations of the HBC and the settlers who followed. Tidal flats once maintained for the harvest of clover rhizomes and silverweed roots, the very root grounds where ***Hillatussella***

the Transformer first made mallard ducks as described at the beginning of this article, were among the earliest lands sought for livestock grazing along this and many other portions of the coast. Such places proved to be among the most readily accessible grazing sites for livestock, and when diked served as early orchards and gardens to non-Native settlers—displacing the ducks, the clover patches, and the Indigenous people who had carefully nurtured these environments for countless generations. Highly productive clam beaches were regularly utilized along the shores of Victoria's inner harbor, in an area that was soon filled in and where today the Empress Hotel stands (Chief Charlie Jones, Queesto, personal communication to Chief Adam Dick, ca. 1980).

The competition for land—not just any land, but specific habitats shaped by long-term human stewardship—was fierce, and it marked the quintessential conflict between settlers and First Peoples. The newcomers, themselves hungry for land no longer obtainable in Britain and elsewhere and viewing the world through an unambiguously Eurocentric lens, were not disposed to take the claims of the existing inhabitants into account or to recognize the coveted habitats of southwestern British Columbia as the product of Indigenous People's intervention. Rather they upheld the ancient Eurocentric belief, as reflected in the works of philosophers like John Locke and Swiss jurist Vattel, that unless the land is settled and cultivated in the style of the agriculturalists of Europe, or used as pasture for domesticated animals, it is not really occupied; in turn, by this logic, the Indigenous Peoples could neither morally nor legally possess or own it (Fisher 1977, p. 104). Subtle but significant Indigenous management practices involving the use of fire, weeding and clearing, pruning, selective harvesting, replanting of bulblets and root fragments, and even transplanting from one area to another, were simply ignored, if recognized at all. The *British Columbian* (1 June 1869) reflected the prevailing mood of the time, asserting that, "according to the strict rule of international law territory occupied by a barbarous or wholly uncivilized people may be rightfully appropriated by a civilized or Christian nation." As inheritors of this ideology, the arriving colonists exhibited few, if any, qualms about dispossessing coastal First Peoples of their most productive resource sites. As Fisher (1977, p. 105–106) noted over four decades ago,

> "Gradually, the ecological balance that the Indian way of life was based on was being eroded.... When the Indians lost their land, it was not only their means of subsistence that was removed. They were also deprived of a major part of their social and spiritual identity."

Growing revelations regarding the extent of traditional management of specific resource sites and habitats in coastal British Columbia underscore the depth and breadth of the impacts Fisher discused in more general terms (see Turner 2020a).

Environmental and cultural consequences of industrial exploitation

The specific impacts of colonial reoccupation on anthropogenic landscapes have been diverse. By displacing the First Peoples of the coast, this reoccupation set the stage for the industrial exploitation of traditional resource procurement sites, a process continued to this day. **Table 1** enumerates major activities and practices undertaken by the European newcomers as part of this historical process, from fur traders on, that have degraded anthropogenic habitats and other key resources utilized by First Peoples of the British Columbia Coast. This represents only a sample of references made in ethnographic interviews to impacts on these types of environments. Only a few citations are provided of individuals' personal observations or literature sources but, in almost all cases, these represent innumerable observations by First Nations Elders, made formally and informally over several decades. Indeed, these observations may have broader representational value, as similar environmental impacts have occurred the world over as colonial powers spread into lands long occupied and managed by Indigenous Peoples (Crosby 1986; Turner 2020a).

Table 1. Major industrial activities in coastal British Columbia that have caused serious degradation of Indigenous traditional habitats and resources, with case examples.[a]

Activity	Chronological notes	Impacts on First Peoples' resources, as recalled by First Nations Elders in ethnographic interviews
Fur trade	Started in late 1700s; continued into 1900s	Loss of wildlife (fur seal, sea otter, beaver, muskrat, mink, marten, and others); loss of coastal kelp beds due to loss of sea otter and resulting over-predation by sea urchins (George 2003)
Commercial fisheries; establishment of canneries; drag-netting	Started in mid-19th Century, proceeded with different fisheries to present	Drastic reduction of available salmon of all kinds, halibut, loss of herring and herring roe, eulachon, rock cod and other rockfish, all up and down the coast, especially Georgia Strait (UBC fisheries 1998; AD, DS, KR; Guujaaw, interview with Harvey 2001)
Destruction of fish weirs and stone fish traps; banning of reefnet fishery and other traditional fishing methods	Dismantling of weirs and traps started mid-19th century, ongoing until 1970s; reefnet fishery banned 1950s	General decline in available salmon and other fish (Claxton and Elliott 1994; Claxton 2015; Carlson 2001; Jones 2002; Luschiim Arvid Charlie, interview with NT, 1999; Marven Robinson, interview with NT, 2000)
Commercial shellfish harvest; including harvest by divers	Accelerating since 1960s, with markets opening in Japan and elsewhere in Asia	Observed reduction and sometimes disappearance of Dungeness crab, red and green sea urchin, geoduck clams, shrimp, gumshoe chitons, horse clams, razor clams, sea cucumbers, and especially rock scallops, abalone (AD, DS, KR)
Commercial whaling	Started in 1790s	Drastic decline in Humpback whales, grey whales (AD, KR)
Clearcut logging of coastal temperate rainforests	Started in 1850s; ongoing throughout the coast (e.g., Clayoquot Sound, Fraser Valley, Kitkiata Inlet, Haida Gwaii)	Loss of old-growth trees, especially old-growth cedar, used for canoes, house construction; cedar roots and cedar bark for baskets (Carlson 2001; Andrea Laforet, interview with NT, 2001; Luschiim Arvid Charlie, interview with NT, 1999; Sewid-Smith et al. 1998) Loss of wildlife (deer, bear, elk, wolf, beaver, raccoons, Douglas-fir squirrels) (Jones 1981; DS) Loss of many types of medicinal plants (e.g., Pacific yew, rattlesnake plantain) (DS, KR, Luschiim Arvid Charlie, interview with NT, 1999) and food plants (e.g., spiny wood fern) (AD) Loss of salmon habitat through destruction of spawning channels, siltation, landslides and warming of waters in streams (DS; Helen and Johnny Clifton, interview with NT, 2001; Scientific Panel… Clayoquot Sound 1995) Alienation of people from their traditional lands and resources Interference with hydrological cycle (loss of bog cranberries at Kingcome due to bog drying up) (AD)
Herbicide and pesticide spraying	Associated with forestry, powerline clearing, rights-of-way (e.g., Port Hardy, Kingcome River)	Indiscriminate destruction of berry bushes (salmonberry, grayberry, elderberry and others); concerns about contaminating the fish streams, wildlife (e.g., deer, bear) forage, and food plants and animals; kills off insects that songbirds and others feed on; notable decline of butterflies, bumblebees, frogs; destroys red alder and other medicinal plants (AD, DS, KR)
Log dumping, sorting and booming; helicopter log dumps	Associated with forestry; usually occurs at estuaries and sheltered bays and inlets; ongoing, but especially noted in 1930s-present	Disturbance, detritus, waterlogged booms, and light blockage destroys eelgrass, clambeds, herring spawning habitat; (Gitga'at Nation; Clayoquot Sound), and eulachon runs (Kingcome River) (Stanley Sam, Nuu-Chah-Nulth, Scientific Panel… Clayoquot Sound 1995; AD)
Road, bridge, highway, railway, powerline construction	Associated with urbanization, logging, industrial transportation systems	Causes major landslides and damage to waterways; Gravel taken from salmon spawning channels in the past; creates fragmentation of wildlife habitat; disrupts hydrological regimes; disturbed ground vulnerable to colonization by introduced species (Carlson 2001) (see under logging)

(*continued*)

Table 1. (*continued*)

Activity	Chronological notes	Impacts on First Peoples' resources, as recalled by First Nations Elders in ethnographic interviews
Draining, dyking and filling in wetlands for grazing, European-style agriculture, building construction	Has occurred widely since 1800s, e.g., Fraser Valley (Sumas Lake) Saanich Peninsula, Kingcome River estuary; Ahousaht	Loss of many culturally important species and habitats, including: coho and other salmon spawning beds, geese, ducks and other waterfowl, cranberries, blueberries, wapato, willows, cottonwoods, crabapples, springbank clover, Pacific silverweed, northern riceroot, camas, cattails, tule, cedar and many other species (Claxton and Elliott 1994; Carlson 2001; AD, DS, KR; Turner 2020a; Whitford and Craig 1918)
Hydroelectric dam construction; reservoirs and urban watershed establishment	Many developed throughout British Columbia (associated with urbanization and industrial development)	Loss of shoreline and lowland habitats; pollution of lakes and waterways; disturbance of fisheries (salmon, sturgeon, etc.); habitat fragmentation; exclusion of indigenous peoples from their traditional lands
Construction of pulp mills, sewage treatment plants; dumping of raw and treated domestic sewage	Has occurred in various locations up and down the coast since early 1900s (e.g., Port Alberni, Elk Falls-Campbell River); City of Victoria	Contamination of clam beds and other seafood harvesting areas; observed loss and reduction of salmon, crab, octopus, red and green sea urchins, butter clams, cockles, seaweed, eelgrass, seagull eggs (AD, DS, KR; Elsie Claxton, interview with NT, 1998) Contamination of springbank clover, Pacific silverweed, northern riceroot, camas (Port Alberni, Hupachesath territory, Johnston Island)
Dredging of harbours; filling and berming shorelines; building breakwaters	Grassy Point, Alert Bay, Cape Mudge; Victoria Harbour, Hartley Bay, Kitimaat	Destruction of ocean floor; observed disappearance of eelgrass, habitat for clams, cockles, shrimp, crabs, bottom fish, herring spawning (AD, DS, KR)
Mining, smelting, gravel extraction	Buttle Lake (Western Mines 1964), Strathcona Provincial Park; Alcan at Kitimat, Britannia Beach and many others	Physical damage and disturbance to land and wildlife; toxic pollution of land and water from tailings and mine runoff contaminates fish and wildlife habitat, drinking water, potentially food plants
Introduction of exotic animals: dogs, cats, pigs, sheep, goats, cattle, grey squirrels; red squirrel, deer, rats, raccoon and beaver (to Haida Gwaii)	Started in mid-1800s, ongoing to present time	Competition for habitat with native animal species, as well as traditional food plants (e.g., camas, springbank clover, Pacific silverweed, riceroot) (Suttles 1951; AD); loss of berries of many kinds to grazing; loss of pollinating insects, and songbirds; loss of cedar, highbush cranberries, seaside strawberries, cloudberries due to deer browse on Haida Gwaii; loss of ground-nesting seabirds to predation by raccoons, rats (Stockton et al. 2001)
Introduction of weeds and exotic plants	Introductions began in mid-1800s, ongoing to present time (English Ivy, Himalayan blackberry, scotch broom, purple loosestrife)	Major impacts on camas, wild onions, harvest brodiaea, chocolate lily, garry oak parkland in general (linked to burning suppression and other impacts); loss of springbank clover, wild strawberries and other species as well (AD, DS, KR; Garry Oak Meadow Preservation Society 2021; Environmental Reporting BC 2015)
Privatization of land ownership; loss of shoreline access	Widespread since the 1850s; Tree Farm Licenses	Alienation of people from their traditional harvesting sites and management practices (decline of clams and cockles) (AD, DS, KR); decline of garry oak and Douglas-fir habitats
Protected area establishment	Pacific Rim National Park Reserve; Strathcona, Rathtrevor Beach, and Goldstream Provincial Parks; many local parks	Loss of access and use of traditional habitat—loss of management and decline of resources (e.g., basket sedge) (Lena Jumbo in Craig and Smith 1997)
Fire suppression and other management practices	Southern Vancouver Island and elsewhere	Decline of berries, both in quantity and quality: blueberries, huckleberries, salmonberries, grayberries (stink currant), salal, *qexmin*; decline of garry oak parkland (camas, chocolate lily, wild onions, harvest brodiaea), wild strawberry, training blackberry, wild caraway; decline in crabapple productivity (AD, DS, KR; Luschiim Arvid Charlie, interview with NT, 1999; Turner 1999)

(*continued*)

Table 1. (*concluded*)

Activity	Chronological notes	Impacts on First Peoples' resources, as recalled by First Nations Elders in ethnographic interviews
Commercial harvesting of nontimber forest products	Cascara bark in 1920s–40s; Pacific yew for Taxol (1980s and early 1990s); other species, ongoing	Loss of culturally important plants for medicine and other purposes (e.g., Pacific yew for carving and manufacture); declining productivity of salal and evergreen huckleberries because of harvest of greens for florist industry; ongoing concerns about harvesting devil's club and other medicinal plants (Lantz 2001).
Fish-farming; oyster-farming; salmon enhancement	Occurring in small scale since . . . .; major moratorium of coastal farming with Atlantic salmon recently lifted by government of British Columbia	Increase in red tide (clams, etc.—making unavailable; competition of Atlantic salmon; Japanese oysters (Ruiz et al. 2000); Destruction of plants for creating spawning channels (e.g., wild ginger at Goldstream Provincial Park—Violet Williams and Elsie Claxton, interview with NT, 1994)
Oil and gas exploration	Upcoming concern in Clayoquot and Hecate Strait; moratorium on exploration soon to be lifted	Potential contamination by oil of kelp, herring, clam beds, seabirds and other marine resources

[a]Compiled from personal observation of the authors (DS for Daisy Sewid-Smith, KR for Kim Recalma-Clutesi, AD for Chief Kwaxsistalla Adam Dick, and NT for Nancy Turner), other Indigenous Elders, and from literature sources. See also Mustonen et al. (2021), this collection.)

Many of the activities listed in **Table 1** are interrelated, and their impacts on certain resources and habitats are compounding and cumulative.[3] Hence, salmon habitat and salmon populations are affected simultaneously by clearcut logging, commercial fishing, road building, chemical and sewage pollution, and draining and diking of wetlands. Declines in salmon, coupled with outlawing traditional weirs, fish traps, and reefnet fishing and outlawing traditional monitoring and management of salmon streams, mean that knowledge of these fish, the techniques and skills used to capture and process them, and the ceremonies and ritual practices associated with the fisheries are also lost—in some cases, never to be revived (see Pinkerton and Weinstein 1995; Turner et al. 2008). Culturally important species, too, are inextricably linked to one another, so that impacts on one species often have cascading effects on others. Thus, salmon, for example, are affected by the reduction of salmonid food sources caused by herring and shrimp fisheries, not to mention the destruction of kelp beds and other salmon habitat both in the ocean and in their spawning rivers, creeks, and lakes. In turn, when salmon are reduced in numbers, populations of seals and sea lions are affected, which then affects the orcas in an ever broadening tangle of cause-and-effect (Estes et al. 1998; Garibaldi and Turner 2004; Ommer and and the Coasts Under Stress Research Project Team 2007). The interrelationships in the food web are explained by Kim Recalma-Clutesi:

[3]In almost any First Nations' territory along the coast, ample evidence points to environmental damage and cultural loss on multiple scales. One of the most complete accountings is found in The Stó:lo Historical Atlas (Carlson 2001), which provides detailed documentation of the consequences of landscape change and resource loss wrought in the Fraser Valley. The early fur-trade, commercial fishing, large-scale clearcut logging, livestock grazing, urbanization, road construction, pollution, channelizing of waterways and draining of wetlands for agriculture have caused major, irreversible environmental changes and consequent loss of many different resources used and managed by the Stó:lo (Coast Salish). All this was combined with the alienation of the Stó:lo people from their traditional territories. In one place, an enormous lake, Sumas Lake, was drained over the course of a few months, with a terrible loss of traditional Stó:lo resources, including salmon, sturgeon and trout, beaver, waterfowl, wapato, and cattail and other basketry materials. In the fall of 2021 the "Sumas Prairie"—the area that was formerly under Sumas Lake—was decimated by flooding and placed under a state of emergency (Hopes 2021).

> "It's very difficult when we've lost the whales, we've lost the salmon. We've depleted what feeds the salmon, what feeds the whale. We're depleting the herring; we are fishing the shrimp and prawns like you wouldn't believe; that feeds everything else. We're just, you know, one by one by one we're going to the deeper and deepest and deepest [part] of the chain and we're just eliminating it. And once you lose that bottom part of what holds it all together, I'm not sure how we're going to put it all back together" (Kim Recalma-Clutesi, 2000 interview).

Likewise, waterfowl and wildlife populations decline through the draining, diking, and filling of wetlands for agriculture and other purposes, not only because they have lost their own habitat but because the plant and animal species they rely on for food and shelter disappear. Many of the resources used by humans are eaten by culturally important animals. A good example is the ***t'ə<u>x</u>ʷsús*** (springbank clover) rhizomes mentioned in the introductory story, eaten by mallard ducks, both legendary and contemporary, as well as by geese and other waterbirds. As takeover of estuarine root gardens for grazing and other agricultural activities eliminated clover and silverweed patches—and prevented the Indigenous People from tending them (Turner and Turner 2008) —so too did this put downward pressure on the numbers and localized availability of hunted waterfowl species.

Often, ironically, the newcomers used the labour of local First Peoples to transform their own landscapes. Displaced from their traditional subsistence modes of production, these peoples were enlisted into the wage economy and became the labour base for mining, logging, herding, agriculture, dam construction, crop harvesting, cannery work, and fishing[4] industries throughout the province, often extracting vital resources from their own lands and waters to support newly developed capitalist enterprises (Knight 1996; George 2003). In building Fort Victoria, for example, James Douglas proudly recorded in the early 1850s: "We have about 100 Indians employed in clearing the Brush and trees and bring new land into cultivation" (Bowsfield 1979: 169–171). In the construction of the fort itself, Douglas offered one 2 1/2 point blanket to the Songhees [Lekwungen Coast Salish] for every 40 cedar pickets cut (Bowsfield 1979, p. xix). Whitford and Craig (1918, p. 114) noted that Indian reserves are to be used for their extractable resources, and that "wherever possible, the Indians are encouraged to do the logging and sawing themselves." Such activities were not restricted to the Victoria area. On Flores Island, behind the village at Ahousaht (Nuu-Chah-Nulth), residential school boys of six or seven years old were made to haul buckets of soil from a large ditch cut to drain the sockeye spawning lake behind the school. This was to grow cultivated cranberries in the lake as a fund-raising venture, though the lake had long been used by the community as important habitat for their own food species (Roy Haiyupis, personal communication to NT, 1994).[5]

At Kingcome Inlet, newly arrived members of the Halliday family who occupied former estuarine root gardens of springbank clover, silverweed, and other edible species, recruited Tsawataineuk people from the reserve at Gwa'yi to reconfigure their lands. The task required the construction of an enormous dike around the property to reduce flooding at high tide, allowing the Hallidays to graze their cattle and other livestock. Once this was done the local people were prevented from accessing their traditional lands or practicing their cultivation. In 1996, Adam Dick lamented,

[4]Daisy Sewid-Smith notes, however, that First Nations were not permitted in the commercial fisheries for many years (see also Mustonen et al. (2021) in this collection).

[5]Whitford and Craig (1918) on the village of Ahousaht: "Original surveyor's maps for Reserve (one labelled May 28, 1894), show a large lake in the centre, and over a good 1/3 or the area of Lot 363, right next to the Mark-to-sis I.R. On one map it is marked 'lake'; on the other 'lake and swamp.' This is just inland from Base Point (later, Yates Point); on the modern map from the Victoria Land Title District, Clayoquot Land District, the lake is not shown at all, but only a few lines depicting a trail and perhaps a drainage ditch. (listed as TFL44 BK8)."

> "It's not there anymore . . . when the Halliday's moved up there, . . . they took over all that land, flat land. Where they [the Tsawataineuk] used to garden . . . on that side where the Halliday farm is now, took all over. . . . They claimed that, and that's what happened. And after that, it disappeared. They quit doing that [tending their root gardens] when the Halliday's went up there and cleaned up that whole flats" (see also Turner and Turner 2008).

Today, only a handful of people at Gwa'yi recall any knowledge of the root gardens on these tidal flats. In 2005, Kwaxsistalla declared sadly, "You don't see them [root gardens] anymore. It's all overgrown with those tall grasses in the flats . . . it's never been looked after . . . . So it's gone." Starting in 2005, along with the authors of this paper and others, Kwaxsistalla led an effort to revive knowledge and practices around traditional estuarine gardening, using lands that had been abandoned by the agricultural settlers of the 19th century (Deur et al. 2013, 2015).

Ultimately, the combined losses resulting from habitat destruction, industrial exploitation, and unsustainable harvesting of Indigenous Peoples' valued resources reshaped and degraded a diverse range of habitats. Not only did the reoccupation and industrial use of the landscape provide a subtext for the displacement of Indigenous Peoples through the reserve system,[6] but they also caused myriad forms of physical displacement from original resource sites. Additionally, the occupation of these culturally preferred and modified habitats effectively compounded the displacement of First Peoples by undermining the production of food resources on which their communities depended. Efforts by government regulators to address resource declines through measures such as curtailment of fishing or giving precedence to sport fishing are especially frustrating to First Nations, who have carefully stewarded resources, only to be excluded from their use because of others' excesses. Talking about sport fishing having precedence over Aboriginal subsistence fishing, Daisy Sewid-Smith lamented,

> "I hurt when I see that; I bleed when I see that. Because we are not talking about dollars and cents, we are talking about a way of life, and we're talking about fulfilling those covenants that were given to us by the Creator. . . . How far do we have to go beyond the Supreme Court of Canada [to regain fishing rights]? To have these things proved in a court of law and then to have people who also have monetary investments in these systems with no idea about the underlying cultural value of these things? They have no idea what happens when you bring to an old person the first sockeye of the year, what that means to them" (Daisy Sewid-Smith, 2000 interview).

The result of habitat destruction, overharvesting, and subsequent regulation is profound cultural damage, and deterioration of peoples' sense of health and well-being (Turner et al. 2008; Turner 2014, 2020a; Thomas et al. 2016). The losses are felt deeply, especially by Aboriginal Elders, as they have been able to personally witness these losses and their secondary effects over the course of their lifetimes. As Daisy Sewid-Smith said, "... many [people] claim, 'No, [environmental damage to our resource sites is] not happening,' but those that grew up there, those that are more aware of their

[6]Through the reserve system established in the 1800s, Indigenous Peoples in British Columbia were confined to small reserves, usually surrounding their villages and some of their camps. The rest of the land was taken over by the Crown, with much of it given away or sold to individuals and corporations. Crown lands were divided up into Tree Farm Licenses, and Timber Supply Areas for logging and replanting as tree farms. In all of these activities, except those directly affecting Indian reserves (and sometimes not even then), the Aboriginal People were never consulted about their traditional lands and territories. Their lands and resources were appropriated for resettlement and industrial exploitation without permission or consultation. For example, when the logging company applied herbicide through aerial spraying from helicopters along both banks of the Kingcome River, the people at Gwa'yi were not consulted, though they were the ones directly affected. "No care for the village. They never even approached the village, not caring what's going to happen to the village. But this is their... the native people don't matter (to them). Native communities don't matter . . . ." (Daisy Sewid-Smith 2000, interview).

surroundings . . . can see the changes. We *see* the changes!" (Daisy Sewid-Smith 1994). Some Elders note that a loss at this scale, undermining the very viability and self-sufficiency of Aboriginal communities, causes some Elders to enter a state of perpetual bereavement. Their sense of loss is precipitated by more than mere nostalgia for an earlier time.[7]

The situation is gradually changing. Starting with the international imperative to recognize and incorporate the knowledge and rights of Indigenous Peoples in economic development and environmental decision-making (United Nations 1987, 1993, 2007; Nazarea 1999; Berkes 2008), there have been initiatives in British Columbia, across Canada, and elsewhere, promoting Indigenous Peoples' rights to control their own lands and resources, or at least to be meaningfully consulted about their use and to participate in co-management. One example is the establishment in the early 1990s of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound (1995), in which four Nuu-chah-nulth cultural experts worked with a group of scientists to develop recommendations for sustainable forestry in Clayoquot Sound on the West Coast of Vancouver Island. Impetus for proper and meaningful consultation has also come from a series of legal decisions based on the protection of Aboriginal Rights in the Canadian Constitution (see Council of the Haida Nation 2009; Turner 2020a). More recent developments, such as the creation of Indigenous Protected and Conserved Areas (IPCAs) as part of the Conservation through Reconciliation Partnership offer hope that places of pronounced cultural significance will be protected for reasons that are at once cultural and ecological, and operate within the legal and philosophical context of national reconciliation (Moola and Roth 2019; Tran, Ban & Bhattacharyya 2020).

There is still a long way to go, however. Canada, for example, originally declined to be a signatory to the United Nations Declaration on the Rights of Indigenous Peoples (United Nations 2007), a landmark declaration adopted by the UN General Assembly. (At the time, as cited in the press release un.org/News/Press/docs/2007/ga10612.doc.htm at the time of voting, "Canada's representative said that, unfortunately, the provisions in the Declaration on lands, territories and resources were overly broad, unclear, and capable of a wide variety of interpretations, discounting the need to recognize a range of rights over land and possibly putting into question matters that have been settled by treaty.") Only sometime later, with pressure from within and from other nations, did Canada sign onto the Declaration. First Peoples are undeterred from their overall goal to regain rights to their lands in a quest for food security and food sovereignty, as well as local, sustainable use of their own resources (Senos et al. 2006; Turner 2020a). In the Kingcome Inlet, beginning with the leadership of Kwaxsistalla, initiatives have been underway with community members and graduate students to reclaim and rework the ***t'aki'lakw*** tidal marsh root gardens at the mouth of the Kingcome River that had been abandoned after settlers appropriated them for cattle grazing; legal efforts continue to secure rights of access to these ancestral garden sites by the people of Kingcome Village today. Kwaxsistalla was one of the few remaining Elders who remembered the nutritious roots the people cultivated there. In time, guided by the ancestral knowledge brought into our time by Kwaxsistalla, and in the spirit of reconciliation, the root grounds, the mallards, and the whole set of ecological relationships prescribed by ***Hillatussella*** the Transformer at the beginning of remembered time might yet return to these flats.

The contributions of Kwaxsistalla and the other Kwakwaka'wakw Ninogaad, and the collaborative work represented here, are part of worldwide efforts by Indigenous Peoples and their allies and colleagues to highlight the importance of Indigenous knowledge, land stewardship, and conservation.

[7]O'odham/Chicano/Anglo restoration ecologist Dennis Martinez (2008) and Raramuri Ethnobotanist Enriqué Salmón (2000), and many others, have noted the powerful sense of kinship Indigenous People feel with the animals and plants around them. Losing these species is like losing their beloved relatives. And, it has often been said that seeing the sacred places where people undertook ceremonial rituals (prayer pools, lakes and deep forests of giant trees) succumb to logging and other forms of destruction is like witnessing the desecration of a cathedral.

Everywhere there is evidence of this overarching movement, which is widely reflected in the literature. For example, Maffi and Woodley (2010) emphasize the role of language and biocultural diversity in conservation. Nicholas (2010) focuses on the imperative for decolonizing archaeology. The Society of Ethnobiology (2021) provides many published resources relating to the decolonization of ethnobiology and ethnobotany (see also Walshaw 2021). Salick and Ross (2009) focus on recognizing Indigenous knowledge as critically important in understanding climate change. Many authors (e.g., Ford and Martinez 2000; Indigenous Circle of Experts 2018; Woodward et al. 2020; Berkes 2021; Fernández-Llamazares et al. 2021) emphasize the need for inclusion of Indigenous Peoples' knowledge and values in successful conservation and environmental management. Kuhnlein et al. (2009, 2013) focus on the critical role of traditional food systems for Indigenous Peoples' health and well-being. The chapters in Asch et al. (2018) focus on resurgence of Indigenous practices and reconciliation, and those in Turner (2020a) on the role of plants and places in the area of Indigenous Land Rights and Title. Borrows (2015) describes the nature and importance of Indigenous Law, and Snively and Williams (2018) and Fernández-Llamazares et al. (2021) recognize Indigenous science as other ways of knowing, in some ways parallel to, but different from, Western science, and equally important to our future. The ongoing forum series *Reconciling Ways of Knowing* (waysofknowingforum.ca/) also features the importance of Indigenous knowledge as complementary to Western science. In many of these publications and venues, Indigenous knowledge holders and authors are leaders and participants in their development. In general, too, Indigenous authors are being widely recognized for their environmental knowledge and wisdom, and for the central role of Indigenous languages, narratives, ceremonies, relationships, and values in environmental conservation and restoration (e.g., Cajete 2000; Atleo 2004, 2011; Brown and Brown 2009; Kimmerer 2013; Borrows 2015; Geniusz 2015; Carroll 2015; Laduke 2017; Vaughan 2018; Winter et al. 2018, 2020; Chang et al. 2019). The Ărramăt project, and this *FACETS* collection, is central to this movement, with strong Indigenous leadership and participation in global efforts to protect and conserve biocultural diversity and environmental integrity.

Conclusions

> "The abundance of salmon and all other foods that sustained the Saanich people, the clams, duck and deer have now been exploited and mismanaged to near extinction . . . . The beautiful clam beaches, lakes, streams, and rivers are now fouled with sewage and are polluted so badly that shell fish gathering and swimming in the waters can be hazardous to one's health. The beautiful homeland of the Saanich, the islands, the bays, the inlets are inhabited with strangers. The hereditary campsites, burial grounds, and old village sites and reef net locations are now forbidden ground. Trespass signs are posted to keep the Saanich people off the shores away from their traditional summer homes" (Claxton and Elliott 1994 , p. 52).
>
> "This is our country, but *you'd think we'd become aliens in our own land*" (Daisy Sewid-Smith, 1997 interview).

Environmental damage, including global climate change and drastic declines in biodiversity, as caused by the industrial exploitation of landscapes worldwide, is arguably the most serious issue facing humans today. For people dwelling in urban settings, human-caused environmental change is somewhat remote from daily life and experience, and is often understood abstractly even by those keenly aware of the issues through education and media. For Indigenous Peoples residing in resettled homelands, including those of coastal British Columbia, environmental loss is more tangibly and immediately linked to their subsistence, lifestyles, and cultural values. Their very identity is tied to their home places and to the plants and animals their ancestors have depended upon for thousands of years. For them, especially for the Elders who have witnessed the damage firsthand, the loss of culturally

significant habitats is no passing curiosity. This loss undermines the economic self-sufficiency of their communities and whittles away at social and cultural practices already near the breaking point. Harvests of camas, springbank clover, silverweed, and other food plants are not less intensive merely because of cultural change. Rather, the plants are not harvested due to the elimination of the anthropogenic habitats necessary to provide safe, viable subsistence quantities of these food products. What First Nations find available to replace these native plants are the introduced foods of the colonial world. In turn, this reduces community ties to landscapes of enduring cultural importance, diminishes incentives for the human maintenance and protection of habitats contributing to the biotic diversity of British Columbia, and enmeshes First Nations communities in global cash economies in which they are peripheral and increasingly dependent participants.

The environmental consequences of industrial activities are compounding and cumulative. They affect culturally important habitats and species along a range of geographical and temporal scales. They are difficult to assess and measure because of the necessity—in at least some cases—of close scrutiny and long-term observation by individuals who are both observant and knowledgeable about small-scale and large-scale changes to species populations and habitats. The stories and observations of individuals about specific places could be told over and over again by others in other localities, as they reflect experiences shared by communities all along the British Columbia coast.

In the past century, almost every major resource of cultural importance to First Peoples has declined and deteriorated, often due to mismanagement by government and over-exploitation by commercial interests. Over this time, First Peoples have seldom been consulted, let alone allowed to manage their own traditional resources. The value of traditional resource practices was not recognized and their rights to use and manage the resources in traditional ways were denied, based on an assumption that First Peoples' lands were not really being used or needed by them. First Peoples themselves were confined to small reserves, usually around traditional fishing places but seldom incorporating their main plant harvesting or seafood gathering areas. The systematic exploitation of their traditional resource sites and habitats—forests, fisheries, waters, wetlands, savannahs and meadows—was paralleled by concerted efforts of church and government to inculcate them with European values and the English language (Claxton and Elliott 1994). Their culture, languages, and lifestyles were viewed as inferior, and their detailed systems of knowledge of the environment and resources, their spirituality and respect for other lifeforms, went unrecognized. Their "gardens," seen through European eyes, were simply undeveloped wastelands. As noted by earlier authors, the inhabitants of coastal British Columbia were displaced from the land, and the implications of this process are only beginning to become clear as we begin to appreciate the extent to which the landscapes of this province were actually the product of long-term stewardship and careful observation and management, and not merely the providential bounty of a "natural park" awaiting human occupation.

The repercussions of these combined cultural and environmental losses for Indigenous Peoples' health and well-being have been profound. In particular, loss and decreased use of traditional foods has resulted in their overall poorer health, with a higher incidence of diabetes, cardiovascular disease, dental caries, and other health problems (Nuxalk Food and Nutrition Programme 1984; Kuhnlein 1992; Stephenson et al. 1995; Stephenson 1997; Kuhnlein et al. (2009, 2013). These problems are compounded by less active lifestyles and the loss of cultural traditions, which leads to an increase in mental and physical health problems. Kim Recalma-Clutesi discussed the health problems associated with loss of traditional food:

> "You know what I'm really scared about, I'm really getting tired of burying people prematurely.... It hurts, calling a 60-year old an elder, and burying them.... It really hurts. And most of that is because of the lack of food, proper food, indigenous food.... It's very hard to practise the culture accurately and properly without proper food.... We are not

> going to survive as a People if we do not have access [to traditional foods]—our bodies have not adapted yet to this new food. … The culture and the food are tied hand in hand" (Kim Recalma-Clutesi, 2000 interview).

New technologies, such as fish farming and genetic engineering of species, compound the problems as they are introduced to peoples' traditional territories with novel and unanticipated environmental consequences. It is perhaps not surprising, then, that many Indigenous People are against commercialization of nontimber forest products, fish farming, and oil and gas exploration on the British Columbia coast, and against genetically modified organisms (Pasternak et al. 2007). They have seen compounding losses and damage from various other kinds of industrial and commercial ventures and do not have reason to believe the impacts of newer industrial activities will be less destructive. Culturally preferred and culturally modified habitats still exist throughout coastal British Columbia, but their status is precarious and their fate as yet uncertain.

What needs to be done to alleviate some of these situations and negative trends that have impacted Indigenous Peoples and their traditional homelands so deeply, both in British Columbia and beyond? How can we reverse the downward spiral of environmental loss that, in turn, impacts people's health and well-being? These are questions that society must address together, but with humility and respect for the knowledge and experiences of long-resident Indigenous Peoples. The first step is already before us, in the requirements set out within the United Nations Declaration on the Rights of Indigenous Peoples (United Nations 2007) and other national and international conventions and reports, including the "Calls to Action" of the Truth and Reconciliation Commission of Canada (2015) and the United Nations Convention on Biological Diversity (1992). Recognizing, respecting, and honoring Indigenous and other "alternative" systems of knowledge, protocols, and values, and finding ways to bring these perspectives forward into the planning and decision-making arena more broadly are key prerequisites. Reconciling different ways of knowing and relating to nature, and acknowledging, as humans, our total reliance on our nonhuman relations and the gifts nature provides for us, will help to raise awareness of what is truly important in the world, and to get us beyond the impasse in which we find ourselves today.

We need to turn away from the mindset of needing to dominate and control nature and instead ask ourselves how we humans can exist within, serve, and support natural systems and natural processes, over a multi-generational time frame. Detailed place-based knowledge and opportunities for decision-making at a local level by those peoples with direct experience and who are most directly impacted is particularly important. Sustaining or restoring Indigenous Peoples' access to their traditional territories and resources, and supporting their governance, oversight, and management of these areas, is not only ethically appropriate but will also likely result in greater environmental sustainability.

Spiritual dimensions of peoples' knowledge systems should not be dismissed either; they can provide overarching guidance based on values and respect for other species and their habitats (Sewid-Smith et al. 1998). Secwepemc cultural expert Dr. Mary Thomas (2001, p. 48) explained from her perspective: "Well, I heard a lot of my elders … talk about the spirituality. And they would say that we as human beings are not superior to Mother Nature's creation. *We are only a strand in it.* And what we do to the environment, we do to ourselves. And those are the things, I guess, that really got me into what I'm doing today." Ceremonies such as the Sacred Cedar ceremony (Sewid-Smith et al. 1998) help reinforce people's relationships with their lands and resources and to pass on their overarching values to the next generations. Supporting Indigenous languages is also a key to supporting biocultural knowledge, since words and language embody important information and concepts. There are already areas of progress in many places, and examples to be followed in the areas of ecocultural restoration and revitalization (e.g., Craig and Smith 1997; Senos et al., 2006; Adolph 2020; Joseph and Turner

2020, Long et al. 2020). With time, and continued revival of cultural relationships with the land, the future of British Columbia's anthropogenic habitats may be secure, ensuring the viability of both the province's First Nations communities and the province's biotic diversity—at the tidal flats traversed by ***Hillatussella***, and far beyond.

Acknowledgements

Kwaxsistalla, Clan Chief Adam Dick (Qawadiliqalla Clan of Dzawataineuk Kwakwaka'wakw), passed away in 2018, but he is listed as first author as a tribute to his role in initiating this article and the knowledge and wisdom he shared with so many (see kwaxsistalla.org/). Many individuals have contributed to this article in various ways. We are particularly indebted to the following people for their insights and teachings: Elsie Claxton, Dr. Earl Claxton, Louis Claxton, Dr. Nicholas XEMŦOLTW Claxton, Seliliye Belinda Claxton, Dr. John Elliott (Saanich); Dr. Luschiim Arvid Charlie, Violet Williams (Halkomelem); John Thomas, Ida Jones, Chief Charlie Jones (Queesto) (Ditidaht); Dr. Richard Atleo (Chief Umeek) and Dr. Marlene Atleo, Chief Earl Maquinna George, Lena Jumbo, Stanley Sam, Roy Haiyupis (Nuu-Chah-Nulth); Thomas Dawson, Flora Dawson, Christine Joseph (Whata), Don Assu (Kwakwa̲ka̲'wakw); Guujaaw (Gidansda), Captain Gold, Diane Brown (Gwaganad), Barbara Wilson (K̲ii'iljuus), Florence Davidson, Chief Willie and Emma Matthews (Haida); Chief Johnny Clifton, Helen Clifton, Marven Robinson (Gitga'at – Tsimshian); Dr. Brenda Beckwith, Randy Bouchard, Dan Cardinall, Catherine Jacobsen, Dr. Reece Halter; Dr. Dorothy Kennedy, Melissa Kingan Grimes, Dr. Harriet Kuhnlein, Dr. Andrea Laforet, Dr. Trevor Lantz, Abe Lloyd, Dr. Sandra Peacock, Robert D. Turner, Dr. Wendy Wickwire. Dr. Jesse Popp and two anonymous reviewers also contributed materially to the final development of this article. Research for this paper was undertaken in part through a grant to NT from the Social Sciences and Humanities Research Council of Canada (#410-2000.1166 and others), and through the MCRI Coasts Under Stress Research project funded by SSHRC and the National Science and Engineering Research Council (Rosemary Ommer, P.I.). We are grateful to Tricia Gates Brown and Dr. Brenda Parlee for their editorial contributions and helpful suggestions for this paper.

Author contributions

CAD, DS-S, KR-C, DD, and NJT conceived and designed the study. CAD, DS-S, KR-C, DD, and NJT performed the experiments/collected the data. CAD, DS-S, KR-C, DD, and NJT analyzed and interpreted the data. CAD, DS-S, KR-C, DD, and NJT contributed resources. DS-S, KR-C, DD, and NJT drafted or revised the manuscript.

Data availability statement

All relevant data are within the paper.

References

Adolph A. 2020. Xáxli'p survival territory: Colonialism, industrial land use, and the biocultural sustainability of the Xáxli'p within the Southern Interior of British Columbia. *In* Plants, peoples and places. Edited by NJ Turner. McGill-Queen's University Press, Montreal, QC. pp. 70–82.

Ames KM, and Maschner HDG. 1999. Peoples of the Northwest Coast: Their archaeology and prehistory. Thames and Hudson, London.

Arnett C. 1999. Terror of the coast. Talonbooks, Vancouver, BC.

Asch M, Borrows J, and Tully J, eds. 2018. Resurgence and reconciliation: Indigenous-settler relations and earth teachings. University of Toronto Press, Toronto.

Atleo ER. (Umeek). 2004. Tsawalk: A Nuu-chah-nulth worldview. UBC Press, Vancouver, BC.

Atleo ER. (Umeek). 2011. Principles of Tsawalk: An Indigenous approach to global crisis. UBC Press, Vancouver.

Berkes F. 2008. Sacred ecology: Traditional ecological knowledge and resource management. Taylor & Francis, Philadelphia, PA.

Berkes F. 2021. Advanced introduction to community-based conservation. Edward Elgar Publishing Ltd, Cheltenham, UK.

Borrows J. 2015. Freedom and Indigenous constitutionalism. University of Toronto Press, Toronto.

Bowsfield H., ed. 1979. Fort Victoria letters, 1846–1851. Hudson's Bay Record Society, Winnipeg, MN.

Boyd, R., ed. 1999. Indians, fire and the land in the Pacific Northwest. Oregon State University Press, Corvallis, OR.

Brown F, and Brown, K, with Wilson B, Waterfall, P, and Webster, GC. 2009. Staying the course, staying alive: Coastal First Nations Fundamental truths. Biodiversity BC, Victoria, BC.

Cajete GA. 2000. Native science: Natural laws of interdependence. Clear Light, Santa Fe, NM.

Carlson KT, ed. 2001. A Stó:Lō–Coast Salish historical Atlas. Sto:lo Heritage Trust, Chilliwack, BC; Douglas & McIntyre, Vancouver, BC.

Carroll C. 2015. Roots of our renewal : Ethnobotany and cherokee environmental governance. University of Minnesota Press, Minneapolis, MN.

Chang K, Winter KB, and Lincoln NK. 2019. Hawai'i in focus: Navigating pathways in global biocultural leadership. Special issue on Biocultural Restoration in K Chang, B Winter, and NK Lincoln, editors. Sustainability, 11(1): 283. DOI: 10.3390/su11010283

Claxton E Sr, and Elliott J Sr. 1994. Reef net technology of the Saltwater people. Saanich Indian School Board, Brentwood Bay, BC.

Claxton N, XEMŦOLTW. 2015. To fish as formerly: A resurgent journey back to the Saanich Reef Net fishery. PhD Diss., University of Victoria, BC.

Cole D, and Chaikin I. 1995. Iron hand upon the people. University of Washington Press, Seattle, WA.

Council of the Haida Nation. 2009. Legislation and acts. Accessed February 25, 2009. haidanation.ca/Pages/Legal/Legal.html.

Craig J, and Smith RV. 1997. "A Rich Forest": Traditional knowledge, inventory and restoration of culturally important plants and habitats in the Atleo River watershed. Report to Ahousaht Band Council, Ahousaht, BC, and Long Beach Model Forest, Ucluelet, BC. University of Victoria School of Environmental Studies, Victoria.

Crosby AW. 1986. Ecological imperialism: The biological expansion of Europe, 900–1900. Cambridge University Press, Cambridge, UK.

Cybulski JS. 1990. Human biology. *In* Handbook of North American Indians, volume 7: Northwest Coast. *Edited by* W Suttles. Smithsonian Institution, Washington, DC. pp. 52–59.

Cybulski JS. 2007. Skeletal biology: Northwest Coast and plateau. In Handbook of North American Indians, volume 3: Environment, origins and population. *Edited by* DH Ubelaker, D Stanford, B Smith, and EJE Szathmary. Smithsonian Institution, Washington, DC. pp. 532–547.

Deur D, Recalma-Clutesi K, and Dick A. 2020. Balance on every ledger: Kwakwaka'wakw resource values and traditional ecological management. *In* Handbook of Indigenous environmental knowledge: Global themes and practice. *Edited by* TF Thornton and SA Bhagwat. Taylor & Francis, London, UK. pp. 126–135.

Deur D, Dick A, Recalma-Clutesi K, and Turner NJ. 2015. Kwakwaka'wakw 'Clam Gardens': Motive and agency in traditional Northwest Coast Mariculture. Human Ecology, 43: 201–212. DOI: 10.1007/s10745-015-9743-3

Deur D, Recalma-Clutesi K, and White W. 2020. Benediction: The teachings of chief Kwaxsistalla Adam Dick and the Atla'gimma ("Spirits of the Forest") dance. *In* Plants, people, and places: The roles of ethnobotany and ethnoecology in Indigenous Peoples' land rights in Canada and beyond. *Edited by* NJ Turner. McGill-Queen's University Press, Montreal; Kingston; London; Chicago. pp. Xvii–Xxiv.

Deur D, and Turner NJ, eds. 2005. 'Keeping it living': Traditions of plant use and cultivation on the Northwest Coast of North America. University of Washington Press, Seattle, WA; UBC Press, Vancouver, BC.

Deur D, Turner NJ, Dick A (Kwaxsistalla), Sewid-Smith D (Mayanilth), and Recalma-Clutesi K (Oqwilowgwa). 2013. Subsistence and resistance on the British Columbia Coast: Kingcome Village's Estuarine gardens as contested space. BC Studies, 179: 13–38.

Duff W. 1964. The Indian history of British Columbia: Vol. 1. The impact of the White Man. Anthropology in British Columbia Memoir No. 5. Provincial Museum of Natural History and Anthropology, Victoria, BC.

Environmental Reporting BC. 2015. Status of invasive species in B.C. State of environment reporting, ministry of environment. Province of British Columbia, Canada. Victoria, BC..

Estes JA, Tinker MT, Williams TM, and Doak DF. 1998. Killer whale predation on Sea Otters linking Oceanic and Nearshore ecosystems. Science, 282: 473–476. DOI: 10.1126/science.282.5388.473 PMID: 9774274

Fedje D, McLaren D, James TS, Mackie Q, Smith NF, Southon JR, and Mackie AP. 2018. A revised sea level history for the northern Strait of Georgia, British Columbia, Canada. Quaternary Science Reviews, 192: 300–316. DOI: 10.1016/j.quascirev.2018.05.018

Fernández-Llamazares Á, Lepofsky D, Armstrong CG, Brondizio ES, Gavin MC, Lyver POB, et al. 2021. Scientists' warning to humanity on threats to Indigenous and local knowledge systems. Journal of Ethnobiology, 41(2): 144–169. DOI: 10.2993/0278-0771-41.2.144

Fisher R. 1977. Contact & conflict. Indian-European relations in British Columbia, 1774–1890. 2nd Ed. 1992. University of British Columbia Press, Vancouver, BC.

Ford J, and Martinez D, eds. 2000. Traditional ecological knowledge, ecosystem science and environmental management. Ecological Applications, 10(5): 1249–1250.

Garibaldi A, and Turner NJ. 2004. Cultural keystone species: Implications for ecological conservation and restoration. Ecology and Society, 9(3): 1. ecologyandsociety.org/vol9/iss3/art1. DOI: 10.5751/ES-00669-090301

Garry Oak Preservation Society. 2021. Garry oak ecosystems. Threats to the Ecosystem. garryoak.info/threats-to-the-ecosystem.html.

Geniusz MS. 2015. Plants have so much to give us, all we have to do is ask: Anishinaabe botanical teachings. University of Minnesota Press, Minneapolis.

George EM. 2003. Living on the edge: Nuu-Chah-Nulth history from An Ahousaht Chief's perspective. Sono Nis Press, Winlaw, BC.

Glazebrook GPT de, ed., Douglas J. 1938. Letter to James Hargrave, February 4, 1843. The Hargrave correspondence. The Champlain Society, Toronto, ON.

Groesbeck AS, Rowell K, Lepofsky D, and Salomon AK. 2014. Ancient Clam gardens increased shellfish production: Adaptive strategies from the past can inform food security today. PLoS ONE, 9(3): e91235. DOI: 10.1371/journal.pone.0091235 PMID: 24618748

Harris RC. 1997. The resettlement of British Columbia: Essays on colonialism and geographical change. University of British Columbia Press, Vancouver, BC.

Harris RC. 2002. Making native space: Colonialism, resistance, and reserves in British Columbia. University of British Columbia Press, Vancouver, BC.

Hebda R, and Frederick SG. 1990. History of Marine resources of the Northeast Pacific since the last glaciation. Transactions of the Royal Society of Canada, Series 1, Vol. I: 319–342.

Hebda R, and Whitlock C. 1997. Environmental history. *In* The rainforests of home, profile of a North American bioregion. *Edited by* PK Schoonmaker, B von Hagen, and EC Wolf. Island Press, Washington, DC. pp. 227–254.

Hopes V. 2021. Abbotsford at 'beginning of a big fight' in flooding situation, says mayor. *The Abbotsford News*, Nov. 16, 2021: abbynews.com/news/abbotsford-at-beginning-of-a-big-fight-in-flooding-situation-says-mayor/

Indigenous Circle of Experts (ICE). 2018. We rise together: Achieving pathway to Canada target 1 through the creation of Indigenous protected and conserved areas in the spirit and practice of reconciliation. Government of Canada, Ottawa.

Jones JT. 2002. 'We looked after all the Salmon Streams': A preliminary assessment of traditional Heiltsuk cultural Stewardship of Salmon and Salmon streams. M.A. thesis. School of Environmental Studies, University of Victoria.

Joseph LS, and Turner NJ. 2020. "The Old Foods are the New Foods!": Reviving Indigenous foods in Northwestern North America. Special Collection on "Traditional Food Knowledge: New Wine into Old Wineskins?" Frontiers in Sustainable Food Systems, 4: 1–20. DOI: 10.3389/fsufs.2020.596237

Kennedy D, and Bouchard R. 1983. Sliammon life, Sliammon lands. Talonbooks, Vancouver, BC.

Kimmerer RW. 2013. Braiding Sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants. Milkweed Editions, Minneapolis, MN.

Kirk R, and Daugherty RD. 2007. Archaeology in Washington. University of Washington Press, Seattle, WA.

Knight R. 1996. Indians at work. An informal history of native labour in British Columbia 1858-1930. New Star Books, Vancouver, BC.

Kuhnlein HV. 1992. Change in use of traditional foods by the Nuxalk native people of British Columbia. Ecology of Food and Nutrition, 27: 259–282. DOI: 10.1080/03670244.1992.9991249

Kuhnlein HV, Erasmus B, and Spigelski D, eds. 2009. Indigenous Peoples' food systems: The many dimensions of culture, diversity, and environment for nutrition and health. Centre for Indigenous Peoples' Nutrition and Environment, McGill University, Montreal; Food and Agriculture Organization of the United Nations, Rome, Italy.

Kuhnlein HV, Erasmus B, Spigelski D, and Burlingame B, eds. 2013. Indigenous Peoples' food systems for health: Interventions for health promotion and policy. Centre for Indigenous Peoples' Nutrition and Environment, McGill University, Montreal; Food and Agriculture Organization of the United Nations, Rome, Italy.

Kuhnlein HV, and Turner NJ. 2020. Traditional plant foods of Canadian Indigenous Peoples: Nutrition, botany and use. Routledge Revivals, Taylor & Francis, CRC Press, Boca Raton, FL.

LaDuke W. 2017. All our relations: Native struggles for land and life. Haymarket Books, Chicago IL.

Lantz T. 2001. The population ecology and ethnobotany of Devil's Club (Oplopanax horridus (Sm.) Torr & A. Gray ex. Mig: Araliaceae). MSc thesis, University of Victoria.

Long JW, Lake FK, Goode RW, and Mae Burnette B. 2020. How traditional tribal perspectives influence ecosystem restoration. Ecopsychology, 12(2): 71–82. DOI: 10.1089/eco.2019.0055

Lutz JS. 2020. Preparing Eden: Indigenous land use and European settlement on Southern Vancouver Island. *In* Plants, peoples and places. *Edited by* NJ Turner. McGill-Queen's University Press, Montreal, QC. pp. 107–130.

Mackie Q, Fedje D, McLaren D, Smith N, McKechnie I. 2011. Early environments and Archaeology of coastal British Columbia. *In* Trekking the shore: Changing coastlines and the antiquity of coastal settlement. *Edited by* NF Bicho, JA Haws, LG Davis. Springer, New York, Springer-Verlag. pp. 51–103.

Maffi L, and Woodley E. 2010. Biocultural diversity conservation: A global sourcebook. Earthscan and International Union for Conservation of Nature, London, UK.

Martinez D. 2008. Native perspectives on sustainability. Interview by D. E. Hall; nativeperspectives.net/Transcripts/Dennis_Martinez_interview.pdf [Accessed 1 March 03 08].

McIlwraith TF. 1948. The Bella Coola Indians. (2 Vols.). University of Toronto Press, Toronto, ON.

Mathews DL, and Turner NJ. 2017. Ocean cultures: Northwest Coast ecosystems and Indigenous management systems. *In* Conservation for the Anthropocene Ocean. Interdisciplinary science in the support of nature and people. *Edited by* PS Levin and MR Poe. Academic Press, Elsevier, Cambridge, MA. pp. 169–201.

Minnis PE. 2021. Famine foods. Plants we eat to survive. University of Arizona Press, Tucson, AZ.

Moola F, and Roth R. 2019. Moving beyond colonial conservation models: Indigenous protected and conserved areas offer hope for biodiversity and advancing reconciliation in the Canadian Boreal Forest. Environmental Reviews, 27(2): 200–201. DOI: 10.1139/er-2018-0091

Moziño JM. 1970. Noticias de Nutka: An account of Nootka sound in 1792. *Edited and translated by* IH Wilson Engstrand. University of Washington Press, Seattle, WA.

Muckle RJ. 2007. The first Nations of British Columbia. 2nd Ed. UBC Press, Vancouver, BC.

Mustonen T, Van Dam B, and Eklund H. 2021. A century of knowledge: Kwakwaka'wakw Elders and environmental change. FACETS. 6(1): 2110–2137. doi.org/10.1139/facets-2021-0101

Nazarea, VD, ed. 1999. Ethnoecology. Situated knowledge/located lives. The University of Arizona Press, Tucson, AZ.

Nicholas GP, ed. 2010. Being and becoming Indigenous archaeologists. Left Coast Press, Walnut Creek, CA. lcoastpress.com/book.php?id=277

Nuxalk Food and Nutrition Program. 1984. Nuxalk food and nutrition handbook. Nuxalk Nation, Bella Coola, BC.

Ommer RE, and The Coasts Under Stress Research Project Team. 2007. Coasts under stress. Restructuring and social-ecological health. McGill-Queen's University Press, Montreal & Kingston.

Ommer RE, and Turner NJ. 2004. Informal rural economies in history. Labour/Le Travail: Journal of Canadian Labour Studies, 53: 127–157.

Pasternak S, Magzul L, and Turner NJ. 2007. Born from Bears and corn: Why Indigenous knowledge systems and beliefs matter in the debate on GM foods. *In* Acceptable genes? Religious traditions/cultures and genetically modified foods. *Edited by* C Brunk and H Coward: Centre for Studies in Religion and Society, University of Victoria, Victoria, BC; and SUNY, New York.

Pinkerton E, and Weinstein M. 1995. Fisheries that work: Sustainability through community-based management. The David Suzuki Foundation, Vancouver, BC.

Recalma-Clutesi, K, director. 2008. Smoke from his fire. Documentary about Chief Adam Dick, Kwaxsistalla. APTN and Knowledge Network, Winnipeg MB.

Reconciling Ways of Knowing. 2021. Indigenous Knowledge and Science forum. Project convenors Miles Richardson, OC; Dr. David Suzuki; Dr. Nancy Turner; and Elder Dr. Dave Courchene, Jr; Project lead coordinator Jacquie Miller; waysofknowingforum.ca/

Ruiz GM, Fofonoff PW, Carlton JT, Wonham MJ, and Hines AH. 2000. Invasion of coastal marine communities in North America: Apparent patterns, processes, and biases. Annual Review of Ecology and Systematics, 31: 481–531. DOI: 10.1146/annurev.ecolsys.31.1.481

Salick J, and Ross N, eds. 2009. Indigenous Peoples and climate change. Global Environmental Change, 19(2): 137–316.

Salmón E. 2000. Kincentric ecology: Indigenous perceptions of the human-nature relationship. Ecological Applications, 10(5): 1327–1332.

Scholefield EOS. 1914. British Columbia. From the earliest times to the present, volumes I and II. S.J. Clarke Publishing Company, Vancouver, BC.

Scientific Panel for Sustainable Forest Practices in Clayoquot Sound. 1995. First Nations' Perspectives on forest practices in Clayoquot sound. Report 3 (with appendices).Cortex Consulting and Government of British Columbia, Victoria, BC.

Senos R, Lake F, Turner N, and Martinez D. 2006. Traditional ecological knowledge and restoration practice in the Pacific Northwest. *In* Encyclopedia for restoration of Pacific Northwest ecosystems. *Edited by* A Dean. Island Press, Washington, DC. pp. 393–426.

Sewid-Smith D. 1979. Prosecution or persecution? Nu-yum-Baleess Society, Cape Mudge, BC.

Sewid-Smith D, and Turner NJ. 1998. Incorporating traditional knowledge, interests and values of aboriginal peoples into restoration of natural systems projects. Helping the Land Heal Conference, Victoria, BC; Ecological Restoration in British Columbia. Victoria Conference Centre.

Sewid-Smith D (Mayanilth), Dick A (Kwaxsistalla), and Turner NJ. 1998. The sacred Cedar tree of the Kwakwaka'wakw people. *In* Stars above, earth below: Native Americans and nature. Background book for Alocoa foundation hall of native Americans (Exhibit). *Edited by* M Bol. The Carnegie Museum of Natural History, Pittsburgh, PA. pp. 189–209.

Snively G, and Williams L. 2018. Knowing home: Braiding indigenous science with Western science, Book 2. University of Victoria, Victoria BC.

Society of Ethnobiology. 2021. Decolonizing ethnobiology resources. ethnobiology.org/decolonizing-ethnobiology-resources.

Stephenson PH. 1997. Environmental health perspectives on the consequences of an ideology of control in 'Natural Systems.' The Canadian Review of Sociology and Anthropology, 34(3): 349–367.

Stephenson, PH, Elliott SJ, Foster LT, and Harris J, eds. 1995. A persistent spirit: Towards understanding aboriginal health in British Columbia. Canadian Western Geographical Series, Vol. 11. University of Victoria Department of Geography, Victoria, BC.

Stockton S, Gaston AJ, and Martin J-L. 2001. Where have all the flowers gone? The impact of introduced black tail deer on the shoreline vegetation of Haida Gwaii, British Columbia. Laskeek Bay Research, 10: 31–42.

Suttles W. 1951. The economic life of the Coast Salish of Haro and Rosario Straits. PhD diss., Department of Anthropology, University of Washington, Seattle, WA.

Suttles WP. 1968a. Coping with abundance: Subsistence on the Northwest coast. *In* Man the hunter. *Edited by* RB Lee and I DeVore. Aldine Publishing Co., Chicago. pp. 56–68.

Suttles WP. 1968b. Variation in habitat and culture on the Northwest Coast. *In* Man in adaptation: The cultural present. *Edited by* YA Cohen. Aldine Publishing Co., Chicago, IL. pp. 93–106.

Suttles WP. 1987. Coast Salish essays. University of Washington Press, Seattle.

Suttles WP, and Ames KL. 1997. Pre-European history. In The Rain forests of home: Profile of a North American bioregion. *Edited by* PK Schoonmaker, B von Hagen, and EC Wolf. Island Press, Covelo, CA. pp. 255–274.

Thomas M. 2001. The wisdom of Dr. Mary Thomas. *Edited by* RJ Hood, NJ Turner, and J Infanti. School of Environmental Studies, University of Victoria, Victoria, BC.

Thomas M, Turner NJ, and Garibaldi A. 2016. 'Everything is deteriorating': Environmental and cultural loss in Secwepemc territory. *In* Secwepemc people and plants: Research papers in Shuswap ethnobotany. *Edited by* MB Ignace, NJ Turner and S Peacock. Society of Ethnobiology Contributions in Ethnobiology Series, Jointly published by Society of Ethnobiology and Shuswap Nation Tribal Council, Kamloops, BC. pp. 365–401.

Thompson VD, Torben R, Garland CJ, Thomas DH, Smith KY, Bergh S, et al. 2020. Ecosystem stability and native American Oyster harvesting along the Atlantic Coast of the United States. Science Advances, 6(28). DOI: 10.1126/sciadv.aba9652

Thornton T, Deur D, and Kitka H Sr. 2015. Cultivation of Salmon and other Marine resources on the Northwest Coast of North America. Human Ecology, 43(2): 189–199. DOI: 10.1007/s10745-015-9747-z

Tran TC, Ban NC, and Bhattacharyya J. 2020. A review of successes, challenges, and lessons from Indigenous protected and conserved areas. Biological Conservation, 241: 108271. DOI: 10.1016/j.biocon.2019.108271

Truth and Reconciliation Commission of Canada. 2015. Honouring the truth, reconciling for the future: Summary of the final report of the truth and reconciliation commission of Canada. publications.gc.ca/site/eng/9.800288/publication.html.

Turner NJ. 1978. Plants of the Nootka sound Indians as recorded by Captain Cook. Sound Heritage, 7(1): 78–87.

Turner NJ. 1995. Food plants of coastal first peoples. Royal British Columbia Museum; and University of British Columbia Press, Vancouver, BC.

Turner NJ. 1998. Plant technology of British Columbia first peoples. Royal British Columbia Museum; and University of British Columbia Press, Victoria, BC.

Turner NJ. 1999. 'Time to Burn': Traditional use of fire to enhance resource production by aboriginal peoples in British Columbia. *In* Indians, fire and the land in the Pacific Northwest. *Edited by* R Boyd. Oregon State University Press, Corvallis, OR. pp. 185–218.

Turner NJ. 2014. Ancient pathways, ancestral knowledge: Ethnobotany and ecological wisdom of Indigenous Peoples of Northwestern North America, 2 volumes. McGill-Queen's Native and Northern Series Number 74. McGill-Queen's University Press, Montreal, QC.

Turner NJ, ed. 2020a. Plants, people, and places: The roles of ethnobotany and ethnoecology in Indigenous Peoples' land rights in Canada and beyond. McGill-Queen's University Press, Montreal, QC.

Turner NJ. 2020b. From 'Taking' to 'Tending': Learning about Indigenous land and resource management on the Pacific Northwest Coast of North America. ICES Journal of Marine Science (ICES-JMS), 77(7–8): 2472–2482. DOI: 10.1093/icesjms/fsaa095

Turner NJ, Armstrong CG, and Lepofsky D. 2021. Adopting a root. Documenting ecological and cultural signatures of plant translocations in Northwestern North America. American Anthropologist, 124(4): 1–19. DOI: 10.1111/aman.13658

Turner NJ, and Chambers FH. 2006. Northwest Coast and Plateau plants. *In* Smithsonian institution handbook of North American Indians; Volume 3: Environment, origins and population. *Edited by* DH Ubelaker, D Stanford, B Smith, and EJE Szathmary. Smithsonian Institution, Washington, DC. pp. 251–262.

Turner NJ, and Clifton H. 2009. 'It's so different today.' Climate change and Indigenous lifeways in British Columbia, Canada. Global Environmental Change, Special Issue on Indigenous Peoples and Climate Change. Edited by J Salick and N Ross. 19(2): 180–190.

Turner NJ, Davidson-Hunt IJ, and O'Flaherty M. 2003. Living on the edge: Ecological and cultural edges as sources of diversity for social-ecological resilience. Human Ecology, 31(3): 439–461. DOI: 10.1023/A:1025023906459

Turner NJ, and Davis A. 1993. "When everything was scarce": The role of plants as famine foods in Northwestern North America. Journal of Ethnobiology, 13(2): 1–28.

Turner NJ, Deur D, and Lepofsky D. 2013. Plant management systems of British Columbia first peoples. BC Studies, 179: 107–134.

Turner NJ, Gregory R, and Brooks C. 2008. Failing, and T. Satterfield. From Invisibility to transparency: Identifying the implications (of invisible losses to First Nations communities). Ecology and Society, 13(2): 7. ecologyandsociety.org/vol13/iss2/art7/. DOI: 10.5751/ES-02405-130207

Turner NJ, and Jones JT. 2000. 'Occupying the Land': Traditional patterns of land and resource ownership among first peoples of British Columbia. CD ROM Proceedings, IASCP 2000 Conference. International Association for the Study of Common Property Resources, Bloomington, Indiana.

Turner NJ, and Lepofsky D, eds. 2013. Ethnobotany in British Columbia: Plants and people in a Changing world. BC Studies, The British Columbian Quarterly. Special Issue, No. 179 (Autumn).

Turner NJ, and Loewen DC. 1998. The original 'Free Trade': Exchange of botanical products and associated plant knowledge in Northwestern North America. Anthropologica, XL: 49–70.

Turner NJ, and Peacock S. 2005. Solving the perennial paradox: Traditional plant management on the Northwest Coast. *In* Keeping it living: Traditions of plant use and cultivation on the Northwest Coast of North America. *Edited by* D Deur and NJ Turner. University of Washington Press, Seattle, WA. pp. 101–150.

Turner NJ, Smith RY, Jones JT, and Reed RA. 2005. 'A Fine Line Between Two Nations': Ownership patterns for plant resources among Northwest Coast Indigenous Peoples – implications for plant conservation and management. *In* Keeping it living: Traditions of plant use and cultivation on the Northwest Coast of North America. *Edited by* D Deur and NJ Turner. University of Washington Press, Seattle, WA. pp. 151–178.

Turner NJ, and Turner KL. 2008. "Where our women used to get the food": Cumulative effects and loss of ethnobotanical knowledge and practice; case studies from coastal British Columbia. Botany, 86(2): 103–115. DOI: 10.1139/B07-020

United Nations. 1987. Report of the world commission on environment and development: Our common future. Accessed May 27, 2021. sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf.

United Nations. 1993. United nations convention on biological diversity. Accessed May 27, 2021. cbd.int/.

United Nations. 2007. United Nations declaration on the rights of Indigenous Peoples. Adopted by the UN General Assembly, 13 September, 2007. Accessed May 27, 2021. un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html.

Vaughan M. 2018. Kaiāulu: Gathering tides. Oregon State University Press, Corvallis.

Walshaw, S. 2021. Ethics and advocacy – organizing equity and decolonizing ethnobiology. Group discussion, Society of Ethnobiology, 2021 Virtual Conference, May 12–14, 2021. Society of Ethnobiology, Boston, MA.

Whitford HN, and Craig RD. 1918. Forests of British Columbia. Canada Commission of Conservation, Ottawa, ON.

Winter KB, Lincoln NK, and Berkes F. 2018. The social-ecological keystone concept: A quantifiable metaphor for understanding the structure, function, and resilience of a biocultural system. Sustainability, 10(9): 3294. DOI: 10.3390/su10093294

Winter K, Ticktin T, and Quazi S. 2020. Biocultural restoration in Hawai'i also achieves core conservation goals. Ecology and Society, 25(1): 26. DOI: 10.5751/ES-11388-250126

Woodward E, Hill R, Harkness P, and Archer R, eds. 2020. Our knowledge our way in caring for country: Indigenous-led approaches to strengthening and sharing our knowledge for land and sea management. Best Practice Guidelines from Australian experiences. NAILSMA and CSIRO. csiro.au/en/research/indigenous-science/indigenous-knowledge/our-knowledge-our-way.