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Lake Sturgeon: The Historical Geography of Lake Winnipeg Fishery Commons

Introduction

In the province of Manitoba lake sturgeon (*Acipenser fulvescens*) is currently threatened, extirpated from most of its original range. This has occurred for a number of reasons. A major feature has been the removal of control over the resource from the local level. Capitalization and resource extraction by outside interests has been allowed and encouraged by Canadian governments. Compounding this, a gap existed between local fisheries overseers and centralized Fisheries Department decision-makers who used incomplete and fragmented knowledge at critical junctures in the development of the sturgeon fishery. Finally, over-lapping uses for resources and development of some resources at the expense of others, i.e. hydro-electrical development, have negatively impacted fish populations and habitats. Few researchers have examined the transformation of resources from common property to commercial commodity. Cree and Ojibwe management of lake sturgeon is reconstructed as the basis for understanding the history of sturgeon fishing and its management on Lake Winnipeg, challenging some of the conventional wisdom and history about the transformation. The paper crosses boundaries of history, zoology and fisheries management theory to reexamine the *sturgeon problem*, incorporating divergent perspectives, including Cree and Ojibwe management systems. The most recent efforts to manage lake sturgeon in Manitoba have been with both formal and informal co-management, one response to a long history marked by successes and failures. The most significant result is a patchy pattern of over-exploitation, limited fishery closures, culminating in an overall decline in sturgeon populations. The paper begins with an examination of changing human-resource relations and the historical commons.

The Historical Commons

Rostlund (1952) challenged that man's relations to food resources were more complex than previously thought. Fish resources did not limit human populations, local opportunity dictated the level of fish use, native fishing technology limited impacts on fish populations, and

aboriginal fishing was a complex, distributed throughout North America. There are sufficient archaeological artifacts, dating to 2000 B.C., documentary evidence since 1740, plus oral histories, to reconstruct Cree and Ojibwe management of sturgeon fisheries for the region around Lake Winnipeg. One cautionary note however, for most historical and anthropological studies of Indigenous pre contact society and even those during the fur trade period, which include sturgeon material, Indigenous use is either misrepresent or ignored (Ray 1974, Hultkrantz 1983, Hallowell 1992). While a few studies consider the role of sturgeon and the fishery, none include details on traditional management processes and institutions (Rostlund 1952, Holzkamm *et al.* 1988, Gulig 1995). Ethno-historical studies have, since the 1970's, more closely reconsidered the importance of fish, though the audience for such studies remain fairly small (Cronon 1983, Tough 1984, Smith 1991). Scientific studies of sturgeon often fail to include a thorough history of sturgeon fisheries and this is reflected in fisheries management that is unable or unwilling to accept and integrate Indigenous knowledge of the fish (Scott and Crossman 1973, Harkness 1980, Houston 1987, Wallace 1991).

The myriad of human-sturgeon relations, focusing specifically on fishing complexes, have changed overtime. Seasonal movement remained a guiding force for most inhabitants around Lake Winnipeg. Some communities, however, were relatively sedentary having access to reliable and secure resources, for example fish. Big game, such as the buffalo (*bison bison*) appeared to have been the predominant resource on the plains, allowing groups to produce the most food with the least effort. Seasonal migration meant that a diversity of resources were used. Life was changed, after 1870, by the demise of the buffalo and decline in populations of other species, influx of settlement, increasing demands on diminishing resources, conversions of tribal lands to private property, industrialization of resources (ie. commercial fisheries), and encouragement to become agrarian, all conspired to transform mother earth into resources. Carter (1980, 1990) has shown that the transformation of Dakota and Cree to agriculturalists in western Canada were fairly successful, that is until government policy was enacted to limit aboriginal success.

Archaeologists have noted sturgeon to be an important resource in human *lifeways* for more than four thousand years. Elder male fishermen would pass sturgeon knowledge to younger fishers of where sturgeon made themselves available in great numbers and the proper fishing methods. Cree and Ojibwe knowledge of sturgeon focused on spawning indicators and sites, sturgeon behaviour (such as feeding), and uses for all parts of the fish. Families would participate in sturgeon fishing and processing, congregating in Spring. The technology used to fish sturgeon varied temporally and spatially and will be discussed in more depth later in this paper. With increased colonization, Cree and Ojibwe management of lake sturgeon in the Lake Winnipeg basin persisted as an organized common property fishery. Traditional use of resources was accomplished through adaptation and mediating past success with future needs.

For many pre contact Cree and Ojibwe, with the exception of Sturgeon clan, sturgeon was considered a gift; it gave its flesh to fishers in exchange for being used responsibly. A fisher who did not show the proper respect while fishing and processing the fish would not be able to catch them in the future. This reciprocal relationship between human-fish continued well into the present for active sturgeon fishermen. Since contact in the 1730's, and especially after the colonization and settlement process beginning in 1821, human behaviour and development have negatively impacted this species.

Traditional knowledge, or what Spry (1991: 83) calls “profound knowledge of the environment,” of sturgeon fishing locations mirrored the biological characteristics of the fish.

Sturgeon would congregate in large numbers to spawn in the fast water at rapids and falls. Fishing areas were not individually owned, rather, they were to be used by all in the community who they became available to. One had to not only claim an area but also actively maintain a presence. Fishing took place near the shore on larger rivers and lakes depending on where sturgeon made themselves available. Men would gather at fast water, spearing, trapping and netting individual fish (which varied between 1-8 feet in length). The patterns of migration-spawning seem to have been relatively stable over many generations. Seasonal fishing camps, such as the 3000 year old site at the Forks (Winnipeg), have been documented by archaeologists (Kroker *et al.* 1993). On smaller rivers, such as the Roseau River, Ojibwe fishing structures could block the entire river to fish movements (Waddell 1970). Interestingly, high Spring waters would render such weirs useless and they could therefore only operate with water levels below the level of the rock fence. On the Roseau River Ojibwe exercised proprietorial rights and if adequately compensated, they would open up their fish dam to log drives, mediating alternative uses (Waddell 1970: 26). At Norway House, the Cree would not permit anyone to completely block the Nelson River with fish nets.

Spry (citing Ahenakew, 1991: 83) argues that "generosity was important in an economy based on sharing the work that had to be done and the proceeds of hunting and gathering." Sharing, an integral component of Cree and Ojibwe life, served as the means by which allocation and distribution of sturgeon was accomplished. Community fishers would co-operate. Fishers would *bring home* the fish, tethered live or processed (butchered or smoked) and give to family relations. The purpose of a sharing network has been misunderstood by historians and anthropologists who equated sharing as a reasonable response to a *brutish short existence.* What these scholars fail to consider is that ethical systems based on learning develop, fishers learn that co-operation far outweighs any sort of benefit resulting from competition. Similar to understandings derived from the *Prisoners Dilemma* framework, sharing results in the greatest pay-offs in reciprocal relations. Sharing sturgeon extended from immediate family members, close relatives, community members and eventually to the settler newcomers. Co-operation-sharing also formed, for a time, the basis for trade relations in the later 1700's. Within reserve communities, up to present, sharing still served the function of cementing the esteem and value of a fisher/hunter to feed others. This has often been overlooked by economists and social planners whose analysis has no value for subsistence components of reserve mixed-economies.

Well into the 1850's sturgeon took on an added exchange value, the flesh, eggs, and swim bladder could be traded for goods while by-products of trade, such as the head and undersized fish, could meet domestic needs. With the introduction of commercial industrial fishing, sturgeon became, essentially, a commodity. The reciprocal relationship between human and sturgeon was diminished. The value of the fish in a commercial market depended on its conversion and fishing effort was measured as a ratio of the return from the catch. As Gould (1991) correctly observed, "white entrepreneurs often used native fishermen for labour," Cree and Ojibwe were marginalized by the industrial fishery. Rather than follow Martin's (1978)folly, suffice to say that these relationships did in fact change in the crude manner described above.

Martin (1978) argued that the majority of beaver trappers were aboriginal and they were responsible for extirpation of beaver; because hunter-gatherer societies lived in close contact with the land they knowingly participated in wildlife overkills. Martin's (1978) thesis and case study of the Micmac and Ojibwa are generalized onto all *Indians,* deriving his thesis from, particularly, fur trade scholarship (Hickerson 1970, Bishop 1970;1974, Ray 1974). Responding to Martin's

thesis, is a collection of essays edited by Krech III (1981). Martin's assumptions of *Indians wagging war on animals* as a response to spiritual crisis resulting from epidemics, is shown to not hold for the Huron nor did it apply to northern Athapaskans. Albers and James (1984: 75) noted "it is ironic that a group of anthropologists has challenged a historian on the basis on faulty temporal interpretation and analysis." Albers and James (1984) argue that Martin mistook metaphorical allusions for cause and effect explanations. In fact, Rotstein's (1978: 1) suggested that a metaphor of wagging war against animals suited the overall "warlike environment of early North American politics". Tanner's (1979) discussion of religious ideology affirmed that worldview is not readily analyzed, nor is it proscribed, for discussions of material production, and Van Kirk (1980) argued that fur trade relations were complex and changing and therefore we must be careful in our pigeonholing. Cronon's (1983) ecological history demonstrates that understanding changes to ecosystems are often rashly attributed to overexploitation when other ecological factors are contributing. As Peers (1991: 107) argued, the general tone of life to 1870 was based not on overexploitation, but rather decisions were based on need, on"what resources to exploit, and when and how to exploit them... part of an overall strategy to extract the most food with the least effort and to maintain a balanced and productive annual food-harvesting round." Fisheries management of Lake Winnipeg sturgeon began to displace Indigenous *community-based* management systems in the early 1870's. Before this time Cree and Ojibwe communities varied in size, based mostly on family groupings, however in areas of abundant resources and trade many families could be found grouped together. Following traditional seasonal patterns, Cree families along the Nelson River, within the boreal sub-arctic forests of their ancestors, subsisted, traded and participated in local labour markets under sway of international commercial forces.

Only those sturgeon needed were fished or tethered and later pulled to shore when required. As a mostly Spring-Summer fish, sturgeon filled an important gap in sustaining human populations. Around Lake Winnipeg, Spring was not a particularly productive time of the year. Fur bearers, with the exception of muskrat, and both small and big game animals such as rabbits, bison and moose, would be harder to access and fat reserves would be greatly diminished by the end of Winter. Between the availability of Spring migrating waterfowl, Summer berries and Summer fattened small and big game, sturgeon was an important resource. While it is difficult to give an exact figure to the domestic-commercial harvests of sturgeon before contact, post contact trade records provide an approximation. Commercial trade in sturgeon and sturgeon products, i.e. isinglass, occurred at a significant level over a considerable time period. For instance, Tough (1989: 7) found that from 1825 to 1891 the Hudson Bay Company (HBC) traded 52,134 lbs. isinglass annually (226,429 lbs. of sturgeon). In contrast, the commercial for export industrial sturgeon fishery produced twice the amount of sturgeon for a shorter duration, 1890-1910, ending when the fishery collapsed!

Fishing technology changed and adapted over-time on rivers of small to medium size and near-shores of larger lakes. With some spatial variations generalizations are possible. The weir and sturgeon trap seem to have been mostly used on rivers. At Roseau River a photo of a historic *Indian fish trap* was taken in 1900 and according to the caption "hundreds of Indians from as far west as Bismark congregated every spring to catch and smoke jacks, sturgeon and catfish" (Waddell 1970: 14). In conjunction with these larger stone and wood constructions, clubs and harpoons seem to have been predominant fishing tools in most of the Lake Winnipeg system. Spears were particularly well suited to fishing at rapids, often with platform construction and use of gaffing hooks. Syms (in Hannibal-Paci 1997) has dated a harpoon from Nelson House to four

thousand years old and similar examples can be found as far east as James Bay (oral accounts of the use and construction of sturgeon harpoon heads have been documented for the Winnipeg River). In open lakes and larger rivers, canoes and nets would be used to go after sturgeon. With the demise of sturgeon populations the use of weirs declined. Increased trade and settlement around Lake Winnipeg enabled commercial nets made mostly from hemp and twines. By the mid to late 1800's the settler, Métis and Aboriginal populations around the Forks at Red River Settlement (now Winnipeg) were no longer afforded the right to use weirs and barrier and thus had to rely on less efficient imported (thus expensive) technology. Set lines became an innovation of colonizing technology for which no traditional North American examples exist. It is with caution this conclusion is reached. For instance, traditional hooks of bone are not preserved in the material record and newer metal technology may have replaced them. We would have oral history to tell us of their existence, yet there is none.

Cleland (1982: 761) viewed fisheries as an "organizing concept for understanding the cultural evolution" of the Great Lakes region. Structurally, he built on the work of Rostlund (1952), thematically tracing historic accounts from 1615 to 1885. Scrutinized archaeological artifacts of barbless copper fishhooks, gorges, nets, net sinkers, harpoons, spears, and bones, for the development of the fishery since the Late Archaic period (3000-1000 BC), Cleland argued that subsistence use of fish resources and settlement systems developed around fish concentrations. He argued that fisheries evolved from spearing and angling to harpooning and netting; fishing sites showed increasing use and specialization of fish species, and hunters evolved into specialized fishers as their knowledge of fish behavior increased. Net technology developed in the Late Woodland period (1350 AD) requiring more complex social relations: labor intensive crews setting-lifting-maintaining nets; gender divisions, men working nets and women processing fish, developed. Cleland (1982) concluded that dependency on reliable resources did not mean decreases in mobility and increases in labor; increasing efficiency of fishing technology also did not mean replacement of less efficient implements. Fishers achieved security by way of increased preservation and storage of surplus.

With changes to fishing technology and increasing demands on sturgeon populations by the fur trade, there is no evidence that the Cree and Ojibwe over-harvested. McCarthy's (1988) examples from Grand Rapids, Manitoba, contextualize Cree use and trade of sturgeon from 1740's to 1880's. In 1887 the Robinson Fish company established a presence at Grand Rapids and in less than ten years the fishery failed and the local economy was seriously threatened by the loss. Similarly, according to Holzkamm and Wilson (1988:4) the Ojibwe at Rainy River sustained a yield of approximately 311,000 lbs. of sturgeon annually between 1823 to 1885, "under Ojibway management the sturgeon spawning run could support a sustainable fishery of considerable size." By 1891 the Ojibwe sturgeon fishery was greatly diminished by over-fishing from "non-Indian Canadian entrepreneurs and settlers" (Holzkamm and Wilson 1988:6).

Transformation of common property of commercial commodity

The effects of Treaty and government policy on First Nations was their exclusion from competing in the development of western Canada. The policy foundations to protect, civilize and assimilate underlay dismantling tribal systems. Throwing Indians on their own resources, really meant forcing them to become peasant farmers. Restriction to simple implements forms a thematic understanding of Indian policy itself; by taking away any opportunity Indians had, it was

unfortunately believed that they could be made good workers and willing candidates for assimilation. Reserve growth was underdeveloped by individualizing and archaic policies. *Indian fishers* were denied the enjoyment of competing in industrial inland fisheries on Lake Winnipeg. Industrial companies stretched nets across the mouths of rivers completely blocking spawning runs. In the competition of bigger boats and new fishing technologies near-shore fisheries collapsed. *Indians* were relegated to a role as labor for industrial companies. Without the necessary capital *Indians* no longer had access to what had once been a reliable and secure resource (fish). To be generous, Indian and Fisheries administrators were practical in their approach to the fisheries, justifying racial policy on conservation of fish stocks.

Sturgeon has not been sustained by the transformation from common property to commercial commodity. The displacement of community-based fisheries to commons was accomplished with unchecked development. Over-harvest of sturgeon was, however, preventable. Lake Winnipeg Cree and Ojibwe were alarmed by the fishing companies and protested to local officials. There was resistance on the part of Fisheries officials to protect fish for *Indians* by restricting the growth of the *fledgling industrial* fishery. Local fisheries managers had a regional example of the impact of human development on the fish at Red River. The Red and Assiniboine rivers were no longer productive sturgeon fisheries after 1875. The failure occurred despite an 1865 order from Governor and Council of Assiniboia making it "unlawful to erect any weirs or barriers in any part of the Red River or Assiniboine" (CSP 1871: 120). No person was charged with maintaining a weir. Moreover, federal fisheries officials believed that Lake Winnipeg's bounty was inexhaustible. Suppression of Cree and Ojibwe fisheries management, competing bureaucracies, and poorly enforced regulations, led to the fisheries collapse.

Few researchers have examined the transformation of resources from common property to commercial commodity. Morton (reprinted 1973) set the stage for the myth of the big game hunter when he argued that buffalo was the most significant commodity in western Canada. Bishop (1970) also drawing on statements found in traders journals, argued that loss of mobility resulting from a switch to fur trade production found northern Ojibwa depleting game and being *forced* to turn to hare and fish for survival, Hickerson (1970) argued that the Chippewa and their neighbors utilized a variety of foods in different seasons, however, game animals were critical, and Ray (1974) placed big game at the pinnacle of a hierarchy of resources. Rather than debate the relative food available to Ojibwe, Overholt and Callicott (1982: 151) argued, "to attain success in life the traditional Ojibwa depended upon the aid of other-than-human persons", thus placing resource use outside the realm of human choice and preference. Friesen (1987) suggested that regional economies were based on the abundance of certain game, however, seasonal movement found most plains peoples moving through a variety of habitats with unique speciation and Smith (1991) argued that despite the fact that fish have been under-valued, northern plains bison hunters often used fish as an alternate subsistence resource. Lytwyn (u.p. 1995) contributed a great deal to the debate, arguing that there are literary roots to the myth of the big game hunter, primarily the journals of Alexander Mackenzie and David Thompon.

Spry's discussions of Aboriginal resource use are probably the best critical examination of the commons for the Great Plains region. Spry (1983) reconstructed tribal common property relations whose access were recognized by tribes through means of force or friendship. Rent's were paid in accordance to a tribes ability to safe-guard valuable resources. Spry (1983) examined the property rights transition through imposition of Treaties and examples of how open

access conditions impacted important aboriginal resources of: bison, fish, woods, and pastures. While aboriginal property rights are suggested to have been use-rights only, Spry argued that Treaty assurances to continued use of lands for hunting and gathering did not materialize. The transition uniquely impacted Métis culture and political-economy, particularly the conversion of common property to scrip and private property. Steady and sustainable use of the lands productivity was lost to its rising monetary value; riches were privately drawn from natural stocks. If private property was a means of securing resources, it was equally a process whereby great wealth could be accumulated based on knowing of how to use capital. Spry (1991: 84) argued that " important changes in the Indians' lifestyle, and in their relationship to the gifts of nature", compounded by migratory patterns of buffalo, industrial demand for hides, and American military Indian policy conspired to injure the once great herds. Conversion of Native land title to private property and the making of rules and regulations for the preservation of resources were "the white solution to the problem of conflicting uses of nature-given resources"(Spry 1991:87).

With regard to First Nations views on land and resources Friesen (1991) contrasts the aspirations of Métis, *Indians* and Canadian government to Treaty one. *Indian interpretations* were that in exchange for reserves they maintained use-rights to resources. *White interpretations* differed in that exclusive right to regulate and restrict access formed the basis of private and state property regimes. In the arena of conservation, Manitoba, like other provinces, sought to limit access to resources, for all except those it licensed, and therefore opposed anything resembling Treaty guaranties to unlimited use of resources. Furthermore, provincial authorities interpreted reserves to be the only area outside of their regulatory authority. This approach was mirrored in fisheries regulation after 1880. Government took access to fish from aboriginal people through definition: domestic, subsistence and commercial; restrictions to season. Conservation sought to restrict fishing during spawning; and imposition of fishing licenses which undermined Treaty rights (outside promises). The post Treaty period is marked by the subjugation of *Indians* in the face of provincial legislation and departmental regulation. According to Friesen (1991: 153), "through their treaty they had sought to secure some of the economic independence that is essential to political autonomy."

According to Newell (1993), from 1871-1918, the West coast *Indian food fishery* was *invented* in the context of pre-industrial frontier political-economy. Newell turned history to show that while *Indian labor* and *technology* were integral to the early salmon fishery-cannery, *conflict* shaped its over-all direction. Fisheries regulations separated subsistence use from commercial and social relations, thus securing the growing cannery, and undermining *Indian* fisheries. *Indians* continued to assert traditional rights to fish. The dependance on *Indian* labor, 1889-1918, was subdued with racial government policy, creating open-access conditions, 1919-1945, that saw an overall marginalization of *Indians* in the fishing industry. After 1946, increased technology radically reorganized the fishery along economic lines: the race of bigger boats, lack of capital, limited opportunity in the centralization of canneries, and discriminatory government regulation found *Indians* increasingly dependent on subsistence fisheries

Discussion

Historical documents from explorers and traders journals reflect limited visits amongst various communities of Cree and Ojibwe. Just what motive/audience the writer had in mind often served to guide what was noted or left out of documents. It is important to revisit these

documents with a few filters in mind. Most traders, explorers and missionaries had in mind the possibilities of establishing trade (precious metals and goods, i.e. beaver) and transportation routes (western passage and Mandans). Often rare and unique objects-occurrences were record and the mundane, for example what was served for dinner and who cooked, was left out. Tropes such as the dying noble savage and motives such as the harvesting of souls often coloured how Cree and Ojibwe were represented to the old and new world. Using these documents for example, Bishop (1970:11) argued that Ojibwe land tenure was based on a "first come first serve" seasonal rotation. While this is not in dispute, Bishop never mentions sturgeon fishing. For most Cree and Ojibwe the spring spawn of sturgeon was of great importance.

As previous alluded to, in areas of abundance, sturgeon served as an important resource within seasonal harvesting patterns. Sturgeon fishing stations served as important gathering places, however, these stations could only sustain limited populations, maintained particularly when other resources such as whitefish, maple sugar, wild rice, big game and waterfowl were also available. Fishing stations were managed by families and communities and trade centers developed around prosperous stations. Prior to the advent of the industrial commercial fishing industry, Cree and Ojibwe maintained large scale, apparently sustainable commercial trade of sturgeon. Opportunistic sturgeon fishing also took place. For those who traveled the waterways sturgeon were gifts that made themselves available (Tanner 1994). Treaty, reserve selection and allocations were based mainly on the availability of reliable fishing grounds, however, the complexity of interpreting the significance of Treaty to First Nations and government exceed the scope of this paper (see Aronson 1988).

On the south basin of Lake Winnipeg and along the Winnipeg River there was a rapid expansion of the commercial industrial fishery. The pressures and innovations of "commercial fishing" displaced Ojibwe fisheries. The incredible pressures on the ways sturgeon were fished and related to, expressed in the peoples manner and fishing institutions, was displaced. The general state of Cree and Ojibwe sturgeon fisheries after 1884 can only be described as *uncommon property resources* caught in a spiraling *tragedy of the commons* (Marchak *et al.* 1987). The fishery was uncommon property because traditional harvesting territories, established through war, negotiation and treaty, weighed less in the eyes of the colonizer than the rights of industrial fishing boats. In the new order of fisheries regulations, Cree and Ojibwe management and rights to fish sturgeon were negated.

It was not until after 1950 that a scientific economic explanation for the commons was developed by Gordon. Gislason (*et al.* 1982: 8) observed that poor economic performance of many unregulated fisheries has been blamed on open access of common property resource management policy. Treaty rights, proprietorial ownership and Indigenous management systems were quickly forgotten when the sturgeon fishery was transformed into a commercial industry. Scientific based fisheries management of lake sturgeon has little to say about Cree and Ojibwe management. Fisheries management is, after-all, value free and culture is treated as cleavage by many scientists and managers. However, the scale of Cree and Ojibwe sturgeon fishing, if we can trust isinglass returns beginning in the 1820-1830's, is large and long standing, relatively stable when compared with unregulated and regulated industrial commercial fishing, characterized by oscillating and deteriorating harvests. Can fisheries management be understood as a science without first analyzing it as a political process? Wilson (*et al.* 1994) argued the science of fisheries management evolved in response to industrial commercial fisheries. Wilson should have also include that it evolved in the wake of colonization, responding to the development of

centralized decision-making, bureaucratization and commercialization. For Lake Winnipeg there was no fisheries management before 1884 because there were only pre-industrial commercial sturgeon fisheries. Efforts by the settler society to manage fishing. By 1865 settlers at the site of present day Winnipeg were restrained from using weirs and barriers. The banning of these ensured that no traditional stewardship continued, that no individual(s) could exercise control over access and allocation to fish resources. Mgr. Alexandre Tache's analysis of the *Northwest* forms the basis to scientific knowledge of Lake Winnipeg fauna. Fisheries management between 1884 and 1893 was greatly influenced by the observations and enforcement of regulations by local fisheries officers.

Knowledge of sturgeon was based on the accumulated observations by local officials and was not driven by scientific-based knowledge of the fish. The poor state of knowledge regarding sturgeon in Manitoba resulted from limits to the communication and dispersal of what was known. In fact, had the knowledge of earlier sturgeon fisheries been factored in, more resources and care for the management of the fishery would have certainly resulted. A significant limit for Fisheries officials were that they were not men of science, rather, they were men with some knowledge of fishing, and more likely men with political affiliation. Clearly, the lack of fisheries regulations in Manitoba before 1880 allowed unprecedented changes in the fishery, i.e. failure of sturgeon spawning up the Red River. It was 1891 before a proper Fisheries organization was established to enforce regulations, and by 1892 doubts about the viability of sturgeon was extended to the Lake Winnipeg fishery. The period leading up to the collapse of the fishery in 1910, sturgeon management (and knowledge of the fish) developed slowly. The unique biological and life history characteristics of lake sturgeon and the history of these fisheries have remained separated in scientific discussions about current management. The significant separation between the biological and socioeconomic aspects are surprising.

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