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Articles

Graham D. Taylor*

The Collapse of the Northern Cod
Fishery: A Historical Perspective

Although the collapse of Atlantic Canada's northern cod fishery may have been unexpected in terms of its rapidity, it is not an isolated or inexplicable event. This paper reviews the major factors affecting the cod fishery crisis (and other natural resource disasters of the 20th century) including: (1) the rapid development of technologies of resource exploitation; (2) the inadequacy of international measures to conserve and regulate the fishery; (3) limitations on scientific capabilities to manage the fishery; and (4) a cultural climate that emphasized economic growth above other values. The paper assesses the prospects for recovery of the fishery in the context of a comparison with the "Dust Bowl" disaster that afflicted farmers in the North American Plains region in the 1930s.

In May 1989 a special committee convened by Tom Siddon, Canada's Minister of Fisheries, and chaired by Dr. Leslie Harris, president of Memorial University of Newfoundland, produced an alarming report on the state of the northern cod fishery of Atlantic Canada.¹ The Harris Committee reported that, contrary to the assumptions of population estimates produced by the Department of Fisheries and Oceans through the 1980s, the northern cod stock was in a perilous condition, and at current rates of harvesting the cod fishery would soon reach the point of commercial extinction.

Over the next three years the state of the cod fishery became a matter of intense government and media attention. While the Minister was reluctant to make major cuts in cod allocations—which would threaten the livelihoods of thousands of people in the Newfoundland and Maritime fisheries—studies by the DFO's scientists confirmed the grim outlook of the Harris Report. The large fish processing firms began to scale back their operations. Finally, in July 1992, Siddon's successor as Minister, John Crosbie—himself a Newfoundlander and a prominent figure in Brian Mulroney's cabinet—closed much of the northern cod fishery for a two-year period. By that point the population of cod of spawning age was estimated to have declined to one-quarter of its size in 1977 when

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1. Canada, *Independent Review of the State of Northern Cod Stock* by L. Harris (Ottawa: Minister of Supply and Services, 1990).

Canada had first sought to confront threats to the fishery by extending its jurisdiction to 200 miles offshore.

As Crosbie's moratorium neared its end, the fishery seemed in worse shape than ever, and the new (Liberal) Fisheries Minister, Brian Tobin, ordered the virtual closure of the entire Atlantic cod fishery for an indefinite period. Even the most optimistic observers did not anticipate the resurrection of the commercial fishery before the year 2000. Tobin's declaration marked the end of an era that extended back 500 years, from the time when Europeans first began to exploit the Atlantic cod fishery, centuries before the emergence of Canada.²

As the crisis turned into catastrophe, explanations proliferated as to its cause, and more precisely, who was to blame. Crosbie, who had initially expressed scepticism over the Harris Report, as Minister of Fisheries took the line that the guilty parties resided abroad. He asserted:

[The Canadian government] has taken conservation and management decisions based on scientific advice, and the Canadian fisheries industry has harvested in accordance with those decisions . . .

By contrast, certain foreign fleets, notably from Spain and Portugal, have continued to catch everything they can outside [the] 200-mile [limit] in a way that would make a 19th Century buffalo hunter in the Wild West blush.³

Crosbie's colourful allusion evoked images of one of North America's most notorious examples of species near-extinction; and, we may surmise, planted the seeds of the "Turbot War" of 1995.

Others sought scapegoats nearer to home. In the fisheries industry, some blamed the crisis on European (and Canadian) animal-rights activists who had successfully lobbied for a ban on seal hunting, maintaining that the ban allowed the rapid and unrestrained expansion of one of the cod's natural predators. Within the academic community, controversies erupted over the role of DFO scientists in the debacle. Throughout the 1980s, it was argued, when the cod stocks could have been able to replenish through careful management of the fishery, these scientists—unwittingly, or under pressure from political and industrial interests—had produced wildly optimistic projections of the spawning levels of the cod population. For their part, some DFO officials and their defenders maintained that other natural factors may have been at work: possibly

2. "A Calamity of Biblical Proportions," *The [Toronto] Globe and Mail* (21 December, 1993) B4; R. Kunzig, "Twilight of the Cod," (April 1994) *Discover* 44; W.H. Lear & L.S. Parsons, "History and Management of the Fishery for Northern Cod in NAFO Divisions 2J, 3K and 3L," in L.S. Parsons and W.H. Lear, eds., *Perspectives on Canadian Marine Fisheries Management* (Ottawa: National Research Council of Canada, 1993) 76.

3. John Crosbie, Letter to the Editor, *The [Toronto] Globe and Mail* (26 February 1992) A15.

sudden changes in water temperatures in the cod spawning grounds or pollutants in the ocean that aggravated mortality.⁴

In a larger historical perspective, the depletion of the northern cod may have been somewhat surprising in terms of its rapidity; but it is hardly unprecedented or inexplicable. A century earlier plaice had all but disappeared from the North Sea fishery. By the 1920s haddock fisheries in the North Atlantic and along the coasts of Maritime Canada and New England were depleted by overfishing, along with sardines off California's shore. In the whale industry, one region after another was "mined" to virtual extinction, from Labrador and the northern Pacific—sites of operations of the Nantucket whalers of Herman Melville's era—before the end of the 19th century; and on into the Arctic and Antarctic waters by the 1930s. A generation later, with almost every species approaching extinction, belated measures were undertaken by the International Whaling Commission to impose constraints on the slaughter. By this time only three countries continued to maintain a whaling industry. During the 1980s the anchovy fishery off the Pacific coast of South America lurched toward catastrophe after only twenty years of intensive exploitation. The freshwater fish of the Great Lakes of North America and the huge inland seas of the former Soviet Union had long before neared extinction as a result of overfishing and pollution. In this context the collapse of the northern cod fishery of Atlantic Canada may seem surprising only in that it was so long delayed.⁵

The history of the decline of the cod fishery highlights four factors which also have more general application to many fishery and resource crises through the 20th century.

I. *Technological Advances*

For more than three and a half centuries after Europeans began fishing off the Grand Banks the basic technologies of fishing and processing remained largely unchanged. During the 19th century "long-lining" was introduced, replacing individual hand-lines and doubling the annual

4. On the debate over the role of DFO scientists in the cod fishery crisis, see Kunzig, *supra* note 2 at 55–58. See also A.C. Finlayson, *Fishing For Truth: A Sociological Analysis of Northern Cod Stock Assessments from 1977 to 1990* (St. John's: Institute of Social and Economic Research, 1994).

5. See generally C. Ponting, *A Green History of the World: the Environment and the Collapse of Great Civilizations* (London: Penguin Books, 1991) at 175–177; K. Johnstone, *The Vanishing Harvest: The Canadian Fishing Crisis* (Montreal: Montreal Star Books, 1972) at 17–22; D. Sahrhage & J. Lundbeck, *A History of Fishing* (Berlin: Springer Verlag, 1992) at 151–152, 225–228 & 250–253; W. Ashworth, *The Late, Great Lakes: An Environmental History* (Toronto: Collins, 1986) at 112–122.

catch rate. Fish canning also developed in this era but had limited impact on the cod fishery whose major products continued to be dried or salted fish. The major innovations came in the early 1900s when otter trawlers first appeared in the Atlantic fishery: these steam-driven ships equipped with 200-foot long bags that dragged the ocean floor substantially increased productivity in the fishery. During this same period improvements in ships' speed and refrigeration technology expanded the market, encouraging consumption of fresh and fresh-frozen fish. This latter development may have provided the northern cod with some respite as attention focused on other species, notably haddock. But Maritime Canadian and Newfoundland inshore fishermen began voicing complaints as early as the 1920s that trawlers depleted the fishery by scooping up vast numbers of fish in an undifferentiated fashion.

After World War II, a variety of technological forces dramatically transformed the scene. Factory trawlers, four to five times the size of otter trawlers and equipped to process and freeze the catch on-board, proliferated along the Grand Banks during the 1950s–60s. Canadian and Newfoundland fishing enterprises lacked the capital to move into factory trawling, but developed larger long-line vessels that enabled them to move further offshore, to offset declining catches in the near-shore fishery. The development of radar and sonar during the war provided better capabilities to track migrating fish; by the 1970s even smaller vessels had access to this equipment.

Earlier technological changes had taken effect fairly gradually on the fishery. The post-war developments took hold quickly and with remarkable impact. Before 1954 the total northern cod catch off Atlantic Canada seldom exceeded 300,000 metric tonnes per year. By 1968 this figure was 810,000 tonnes. Overall cod catch for all the major fishing countries rose from 969,000 tonnes in 1954 to 1.9 million tonnes in 1968. But this date marked the high point in the history of the cod fishery. By 1975 the overall catch had fallen to 639,000 tonnes and Atlantic Canada's share to one-quarter its level in 1968.⁶

The development of new technologies for exploitation of the fisheries is a reflection of general trends throughout the past century. Technological changes have accelerated particularly since World War II, in part simply because the capabilities for development are there, and innovations in one technology can trigger changes in other areas. The diffusion of technological innovations has also increased, enhanced by improvements in communications and capital flows. With few cultural constraints

6. D. Sahrhage & J. Lundbeck, *ibid.* at 98–130; D.A. Pepper, *Men, Boats and Fish in the Northwest Atlantic: An Economic Evaluation* (Ph.D. Thesis, University of Wales, 1978).

on the expansion and use of new technologies, achieving the goal of “sustainable development” of threatened resources such as the fisheries depends on diplomacy and management — and in these areas the record of achievement has been less impressive.

II. *Inadequacy of International Regulation of the Fisheries*

The history of the Newfoundland and Maritime Canadian fishery has been punctuated by conflicts among the European powers during the 16th to 18th centuries, and confrontations between the U.S. and Canada well into the present era. But these were primarily conflicts over access to a rich commercial area and over questions of sovereignty, not struggles to control a declining resource. Until the 1950s the number of national players on the field was limited, and the cod seemed plentiful. Transportation and technological improvements, however, lured others into the Northwest Atlantic fishery, most notably Germany and the Soviet Union, who were operating some of the largest factory trawler ships in the area in the 1960s. By this time the Japanese had also entered the scene.

The basic problem for the fisheries is that many species (including cod) are migratory, and their migrations take them across international boundaries and across the “high seas.” Beyond the traditional three to twelve-mile coastal limits, little if any power could be exerted by any one country over foreign fishing operations. In the immediate aftermath of World War II, there was some recognition of the need for international cooperation, at least to monitor fishing activities; in 1949 the nine countries most substantially involved in the Grand Banks fishery established the International Commission on the North Atlantic Fisheries (later the Northwest Atlantic Fisheries Organization). But while ICNAF’s data-gathering operations signalled the growing crisis in the cod (and other) fisheries, and sought to develop measures to limit and allocate catches, it had little in the way of enforcement powers. This experience was not unique to ICNAF; the International Whaling Commission established in this same era proved virtually incapable of securing agreements among its members despite clear evidence that most species were being hunted to extinction.

Canada (and the U.S.) lobbied strenuously for imposition of enforceable controls through the 1970s. Failure to secure agreement through ICNAF contributed to the decision in both countries to extend their coastal zones to 200 miles offshore in 1977. Although this step substantially expanded the area over which Canada could exert direct regulatory controls, it did not fundamentally change the underlying circumstances affecting the fishery. Without basic agreements adhered to by all parties,

overall management of the fisheries for long-term stability remains at best an objective that could only be met in a limited fashion.⁷

III. *The Limitations of Science*

One of the premises upon which Canada justified extension of coastal jurisdiction from twelve to 200 miles was that, as the country most affected by problems of overfishing, it could be expected to exercise careful internal regulation in order to ensure long-term preservation of the fishery. Canada could boast of a long history of research in the field, dating back to the establishment of the Fisheries Research Board in the 1890s. In 1973 that body was integrated with the Canadian Fisheries Service in anticipation that it would play a more direct role in the implementation of regulatory policies. During that period the Canadian government had also established procedures through which overall catch quotas could be set, and licenses issued on a limited basis.⁸

In this context any errors in predictions of the cod stock on the part of scientists would have serious policy implications, not only for the Canadian fishing industry but also for the Canadian government's negotiating position vis-a-vis other members of ICNAF. The Fisheries Research Board had not been substantially involved in this kind of activity before the 1970s. The expansion of its responsibilities required development of expertise in the field of population dynamics that was still fairly novel (with major development occurring since the 1950s), and involved application of mathematical modelling rather than the traditional approaches used by marine biologists. The DFO restructured its research operations to develop these capabilities; but there was a gap between the public image of certainty in the application of these techniques and the realities of carrying out research in an area much larger than anything Fisheries scientists had had to deal with before. Furthermore, this transition occurred in an atmosphere of general euphoria about the prospects for development of the Canadian fishing industry within the new 200-mile limit.

That errors were made, particularly in the mid-1980s, is virtually incontestable. The reasons for these errors remains a subject of controversy. One recent analysis cites a range of elements in the situation:

7. D. Sahrhage & J. Lundbeck, *ibid.* at 276–280; A.T. Pinhorn & R.G. Halliday, "Canadian versus International Regulation of the Northwest Atlantic Fisheries: Management Practices, Fishery Yields and Resource Trends, 1960–86" (1990) 10 *North American Journal of Fisheries Management* 154.

8. J. Gough, "A Historical Sketch of Fisheries Management in Canada," in L.S. Parsons & W.H. Lear, eds., *supra* note 2, at 26.

deficiencies, or at least, uncertainties involved in the actual techniques for determining population size and trends; a tendency on the part of DFO officials to opt for the most optimistic scenarios; communication problems within the research organization; and a defensive response by the scientists to outside criticism. Other studies have cited such considerations as inadequate funding to support the scale of operations necessary for reliable measurements, and the incidence of unanticipated or even unknown factors, such as undersea temperature shifts.⁹

Underlying the debate is a basic problem in scientific research, particularly in the conditions that prevailed in the Atlantic Canadian fishery. L.S. Parsons and W.H. Lear concluded after a review of the entire history of the debacle:

The problems in accurately estimating stock abundance are not unique to northern cod. The history of management of fish stocks throughout the world is replete with examples of variance in estimates of equal proportion . . . [These] underscore the uncertainties inherent in fisheries management. They exemplify the great difficulty in long-term planning when dealing with a naturally variable resource.¹⁰

But Canada's fishery policies were based on a confidence in the capabilities of science to establish reasonable certainties in this area. Possibly a clearer appreciation of the limits of scientific capabilities might have provided for a more conservative management policy. But in a climate that focused on growth as a major economic and social objective, advocates of caution had few opportunities to present this case.

IV. *The Cultural Climate*

It is a fashionable cliché to observe that industrialized societies embrace cultural values that regard the natural environment as something to be mastered, that forces of science and technology can surmount any natural obstacle, and that prolonged, exponential economic growth is a positive and essential goal. These values are not exclusively linked to "capitalist" countries: the former Soviet Union has one of the worst track records in history for environmental destructiveness. The general assertion neglects, however, the emergence of an environmentalist tradition that can be traced back at least to the early years of the Industrial Revolution in the 18th century, if not earlier.¹¹

9. A.C. Finlayson, *supra* note 4 at 81–100; W.H. Lear & L.S. Parsons, *supra* note 2 at 76–82.

10. W.H. Lear & L.S. Parsons, *ibid.* at 86.

11. See K. Thomas, *Man and the Natural World* (New York: Pantheon Books 1983); D. Worster, *Nature's Economy: A History of Ecological Ideas* (New York: Cambridge University Press, 1977).

In the present context, it is interesting to trace the ways in which contemporary shifts in general attitudes toward environmental issues relate to changes in fishery policies. In the immediate aftermath of World War II, the benefits of technology and the centrality of growth and reconstruction were major features on the economic and cultural scene. By the 1960s and early 1970s, however, a more critical strain of thinking was emerging. Popular authors warned of the dangers of unrestrained population growth, organizations such as the Club of Rome provided computer models purporting to demonstrate that many natural resources were nearing the point of exhaustion, and the energy crisis dramatized for the everyday citizen the perils of the “limits to growth.” This was also the era in which the threats to the northern cod fishery emerged, and the apparent inability of international bodies to take effective action reinforced a view that Canadians must act to preserve their fisheries — as the Canadian government was acting to defend the country’s oil reserves from foreign control.

By the end of the decade environmentalism was in retreat. Neoconservatives in England and North America chastised the environmental movement for exaggerating its cause; in the emerging globalized economy, what was needed was a re-commitment to traditional values of economic growth and restrictions on governmental regulations. Perhaps more significantly, the environmentalist community was undergoing a shift. The “limits to growth” thesis encountered criticism from those who argued that careful management of scarce resources would produce “sustainable development,” balancing environmental concerns against social and economic needs. This was the framework within which fisheries management policies were taking shape.

“Sustainable development” ideas have much in common with the themes of the conservation movement earlier in the 20th century. Critical of unrestrained, unplanned resource exploitation, conservationists nevertheless adhered to the basic objectives of using scientific and technological capabilities to achieve economic growth through “sustainable yield” techniques. Where environmentalists in the 1970s emphasized equilibrium and adaptation, their successors focused more on concepts of change and development.¹²

While the designers of fishery policies in the early 1980s were not necessarily operating on a “neoconservative” agenda, emphasis was

12. On environmentalism in the 1970s–80s and “sustainable development” concepts and conservation see D. Worster, *The Wealth of Nature* (New York: Oxford University Press, 1993) at 142–155. See also S.P. Hays, *Beauty, Health and Permanence: Environmental Politics in the United States* (New York: Cambridge University Press, 1987).

clearly placed on growth as the central objective. The industry was reorganized at that time on the premise that there would be expanding capacity. As those prospects dwindled, emphasis shifted to focus on “conservation and management” of the resource.

Can the cod fishery recover through “conservation and management” to achieve “sustainable yields”? At this point it would be hazardous to predict the outcome: historically, some fisheries have been resuscitated to commercial viability, but the “readjustments” in the work force in the industry are likely to be permanent. Historical analogies are not without perils when used for predictive purposes, but it may be useful to consider as a comparison the long-term impact of the crisis that engulfed the North American prairies in the 1930s.

The extended drought and massive dust storms that devastated the Great Plains region of the United States and Canada in that era have been designated by Donald Worster as “the most severe environmental catastrophe in the entire history”¹³ of North America. Drought, like fish stock fluctuations, were part of life for Plains farmers; but the “Dust Bowl” storms stripped the land of its topsoil, destroying the livelihoods of hundreds of thousands of small farmers from Saskatchewan to Texas. The origins of the crisis involved elements that parallel in many ways those that destroyed the northern cod fishery.

The environment of the Great Plains was more fragile than the North Atlantic fishery and it succumbed after a relatively short period of intense exploitation. In other respects, however, there are similarities. As in the fishery, farmers on the Plains were small-scale operators, and when prices for wheat and corn declined drastically in the 1920s (due in large part to a resurgence of international competition after World War I), each producer farmed the land more intensively, trying to recoup losses through increased production. The introduction of mechanized farm equipment encouraged this intense land use and increased costs of production. By the end of the decade the soil had been scoured, left vulnerable as a prolonged period of drought ensued. Between 1931 and 1935 drought, wind storms, and grasshopper infestations tortured the people of the Plains like so many Biblical plagues.

The response by governments ranged from short-term relief programs to longer-term measures to salvage the land. In the United States these measures included creation of a “shelter-belt” program of reforestation to halt the “desertification” of the Plains, promotion of soil conservation activities, and the development of massive irrigation projects. None of

13. D. Worster, *Dust Bowl: the Southern Plains in the 1930s* (New York: Oxford University Press, 1979) at 24.

these measures was completely successful—although more temperate weather conditions helped alleviate the situation by the end of the “Dirty Thirties,” a new round of dust storms threatened the Plains again in the 1950s and the 1970s. But soil conservation did at least permit a partial recovery for farming on the prairies. At the same time, this post-World War II renewal involved far fewer farmers, operating on a much larger scale and using more capital-intensive methods; and a significant and continuing role for government in controlling production levels and maintaining irrigation infrastructures.¹⁴

While historical analogies have their limitations, the experience of the “Dust Bowl” suggests that the revival of the fishery would be accompanied by the emergence of fewer, more consolidated operations and a continuing regulatory role (and probably a continuing financial commitment) for the Canadian government. But even a well-managed Canadian fishery would be vulnerable to future crises without some form of enforceable international agreements on conservation of the resource on a trans-Atlantic basis. If the aftermath of the “Turbot War” leads to some greater degree of international cooperation—an unlikely scenario at the present—future historians may see the crisis of the 1990s as a benchmark in the evolution of a sustainable fishery rather than the final stage of its demise. But the “uncertainties inherent in fisheries management,” are perhaps even more applicable to the history of a resource where the vagaries of nature are compounded by the complexities of international politics, economic pressures, and deeply-held cultural convictions.

14. See generally D. Worster, *ibid.*; G. Friesen, *The Canadian Prairies: A History* (Toronto: University of Toronto Press, 1987) at 382–394 & 429–436; J.L. Shover, *First Majority Last Minority: The Transforming of Rural Life in America* (Dekalb: University of Illinois Press, 1976) at 141–170.