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Title: More in the Breach than the Observance: Crayfish, Conservation & Capitalism c. 1890-c.1939.

by: Lance van Sittert

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"MORE IN THE BREACH THAN THE OBSERVANCE": CRAYFISH, CONSERVATION & CAPITALISM c.1890-c.1939

by
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An emerging environmental history in South Africa has so far focused exclusively on terrestrial environments and their human-resource interactions (land, game, forests)[1]. In so doing it has also been heavily influenced by the revisionist and social history of the past two decades and careful to locate environmental issues in the broader social, economic and political context of an emerging capitalism in Southern Africa. No attempt has yet been made, however, to extend the scope of this endeavour to encompass the marine resource and recent environmental literature on the subject still evidences a strong present-mindedness which strongly detracts from its analysis[2]. The marine environment is innately hostile to capitalism, except in its petty or merchant forms, by virtue of its common property status and susceptibility to a range of "natural factors" which disrupt production[3]. For productive capitalism to succeed in such a hostile environment, it needs to be able to limit the effects of both these factors on accumulation in order to justify investment. In South Africa this was achieved after 1945 through large-scale central state intervention, assuming ownership of the resource and conferring de facto private property rights on private exploiters and lessening the effect of "natural factors" on production through the provision of infrastructure and marine research[4]. Prior to this, capital's successful exploitation of the marine resource was fundamentally dependent on untrammelled access, relying on the sure abundance of the latter to compensate for the detractions of non-ownership and the vagaries of weather and resource. These constraints also made marine resources a low development priority alongside mining and agriculture and saw them relegated to the realm of the regional maritime state which was too weak exercise effective ownership, confer ownership rights on capital or mediate the effects of natural factors on production. The Cape colonial state concentrated its efforts on developing deep sea trawling, but after 1910 the provincial state confined itself to the "preservation" of fish and game. The

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[1] See for example the Special Issue "The Politics of Conservation" in Journal of Southern African Studies, 15, 2, 1989.

[2] F. Manuel & J. Glazewski "The Oceans: Our Common Heritage" in J. Cock & E. Koch (eds) Going Green (Cape Town, 1991) and J. Clarke Back to Earth (Johannesburg, 1991), pp.136-151.

[3] See for example S.A. Mann & J.M. Dickinson "Obstacles to the Development of a Capitalist Agriculture" in Journal of Peasant Studies, 5, 4, 1978, pp.466-481; P.R. Sinclair From Traps to Draggers (St Johns, 1985), pp.141-148 and J-P. Platteau "Penetration of Capitalism and Persistence of Small-Scale Organisational Forms in Third World Fisheries" in Development and Change, 20, 4, 1989, pp.621-654.

[4] L. van Sittert "Labour, Capital and the State in the St Helena Bay Fisheries c.1856-c.1956" (Unpublished Ph.D Thesis, University of Cape Town, 1992), pp.295-373.

latter's attempts to carry out this mandate set it on a collision course with nascent fishing capital.

The ensuing conflict was most protracted in the case of the crayfish industry where productive capital had been able to establish a beach-head due to the accessibility, super-abundance and relatively sedentary nature of this crustacean. Initially "a food for the poor" and cheap bait for line fishing, crayfish's similarities in appearance and taste to the lobster of the northern hemisphere facilitated the emergence of a flourishing export trade by the second decade of the 20th Century. The South African industry's competitiveness abroad was dependent on a plentiful supply of cheap raw material at home and in defense of an open resource frontier, the canners vigorously resisted all attempts by the colonial and provincial states to impose conservation on the industry which might constrain and even threaten the raw material supply. It was only in the late 1920s that the canning industry acceded to the closing of the frontier, not to conserve the resource which was by then badly depleted along the Peninsula and southern west coast, but to prevent new entrants from gaining access to it. So too the industry used the threat of resource depletion in the first half of the 1930s to restrict an emerging freezing industry. Conservation thus became a means for the canning industry to establish weak proprietary rights over the crayfish resource, while continuing to exploit it as before without regard to legislative restrictions. Such disregard, however, became increasingly problematic after 1936 as the central state intervened ever more directly in the crayfish industry. It soon understood that the conservation of the resource was dependent on the rationalisation of the export industry through control of production and wholesale marketing and the 1939 Crawfish Export Act laid the basis for such a reorganisation. Throughout the period 1890-1939, however, crayfish conservation was at best an ideal and at worst another weapon in the armoury of competing capitals jockeying for advantage on the export market. As the Director of Fisheries lamented in 1936, crayfish conservation was honoured by the industry "more in the breach than the observance" and this did not change until after the Second World War[5].

FROM "POOR MAN'S FOOD" TO LUXURY EXPORT

Any discussion of the history of human exploitation and management of the crayfish requires some prior knowledge of this crustacean's life-history, for it is only by understanding the latter that the problems and complexities facing the former can be understood. To begin with, the Cape or west coast crayfish or spiny lobster (*Jasus lalandii*) is but one of fourteen known crayfish species found in the seas around southern Africa[6]. When most people talk about crayfish, it is invariably *Jasus lalandii* that they have in mind and only a practised eye can tell it apart from its less well known or abundant deep and warm water cousins which frequent the south and east coasts. *Jasus lalandii* is, by default, then a littoral, cold water crayfish native to the west coast from Cape Agulhas to southern Namibia.

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[5] C. von Bonde "Fishery Legislation, Conservation and Research: A Plea for Co-operation between the Industry and the Fisheries Survey Division" in Crawfish Canners' News Bulletin, 3, 1, 1936, p.1.

[6] C. von Bonde & J.M. Marchand The Natural History & Utilisation of the Cape Crawfish, Kreef or Spiny Lobster, Jasus (Palinurus) lalandii (Milne Edwards) Ortmann (Fisheries & Marine Biological Survey [FMBS], Fishery Bulletin No.1, 1935), pp.6-8.

Both its range and abundance are governed by the Benguela upwelling system which relies on prevailing summer south-easterlies to force plumes of cold, nutrient-rich sub-surface water up over the broad western continental shelf. The combination of nutrients and sunlight produce verdant plankton pastures which sustain a marine ecosystem characterised by the super-abundance of relatively few species[7]. Within this unique macro environment, *Jasus lalandii* has evolved as the chief sessile predator of the marine benthos, colonising kelp beds, reefs and offshore islands to depths of 70 metres or more and preying chiefly on ribbed mussels[8].

Despite more than a century of commercial exploitation, crucial stages in the life cycle of *Jasus lalandii* remain obscure. In stark contrast to their more familiar sedentary adult form, Cape crayfish start life as free-swimming microscopic larvae (phyllosomata) which bear no physical resemblance to the adult and pass through no fewer than eleven metamorphoses[9]. The larvae enter the offshore currents on hatching and traverse the Atlantic Ocean, riding the mid-ocean gyres on a round trip from the west coast of Africa to the east coast of South America and back, the duration of which is unknown. Upon their return the phyllosomata rely on environmental cues to recognise their home area, whereupon they undergo a final metamorphosis before settling out in juvenile (perulus) form in shallow kelp beds along the shore[10]. The perulus is in effect a transparent, miniature crayfish (2cm) and takes a further five years to reach adulthood and sexual maturity, moving progressively further offshore into deeper water as it does so[11]. Adult *Jasus lalandii* moult (shed their hard exoskeleton) annually, the new shell taking a time to harden, during which the crayfish is literally soft-shelled. Males grow more rapidly and larger than females and moult in spring (September-November). The females moult in autumn and early winter (April-June) followed by mating. The fertilised eggs (or "berry") are carried on the underside of the female's "tail" (abdomen) for five months before hatching (a fully-grown female carrying as many as 240 000 eggs at a time). Hatching takes place in summer (October-November) and is timed to coincide with the onset of upwelling which facilitates the dispersal

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[7] L.V. Shannon "The Physical Environment" in A.I.L. Payne & R.J.M. Crawford (eds) Oceans of Life off Southern Africa (Cape Town, 1989), pp.21-27.

[8] M. & G. Branch The Living Shores of Southern Africa (Cape Town, 1988), pp.66-80.

[9] C. von Bonde The Reproduction, Embryology and Metamorphosis of the Cape Crawfish Jasus lalandii (Milne Edwards) Ortmann (FMBS, Investigational Report [IR] No.6, 1936), pp.15-20 and B.I. Lazarus The Occurrence of Phyllosomata off the Cape with particular reference to Jasus lalandii (Sea Fisheries Branch [SFB], IR No.63, 1970).

[10] D.E. Pollock "Spiny Lobsters" in A.I.L. Payne & R.J.M. Crawford Oceans of Life off Southern Africa, pp.77-79.

[11] B.I. Silberbauer The Biology of the South African Rock Lobster Jasus lalandii (H. Milne Edwards) 1: Development (SFB, IR No.92, 1971) and D.E. Pollock Growth of Juvenile Rock Lobster Jasus lalandii (SFB, IR No.106, 1972).

of the larvae offshore[12]. *Jasus lalandii's* dependence on the Benguela upwelling system is further evidenced by the marked decrease in size and onset of sexual maturity northwards up the west coast. This is believed to result from overcrowding caused by poorly oxygenated water offshore due to the decay of phytoplankton blooms in the upwelling regime[13]. Compared to its relatives further east *Jasus lalandii* is slow-growing, longer-lived (30-40 years) and larger. This combination of super-abundance, accessibility and size has made it an historically important food source for human populations living along the western coastal fringe of Southern Africa since earliest times.

A mass of evidence from countless coastal middens and cave floor deposits attests to the importance of crayfish as a seasonal staple in the diets of pre-colonial hunter-gatherers[14]. With the advent of European colonialism crayfish remained an important marine resource, due mainly to its abundance. In 1892 one observer related how "you see them [crayfish] coming in, in banks, like a bank of snoek or harders, ten or twelve feet deep, piled one top of another"[15]. Ironically, this abundance (and its habit of congregating in huge numbers around the Woodstock sewer outfall in Table Bay) led to the crayfish being socially undervalued as food by the colonists, who compared it unfavourably to the more familiar lobster of the northern hemisphere. As one prominent fish merchant explained "It is not a lobster, it has quite a different flavour to an English lobster"[16]. Another said more simply "the crawfish is a food for the poor" and welcomed its eradication in Table Bay as conducive to trawling for more highly prized soles[17]. Even those favourably disposed to the crayfish were chiefly concerned with its importance as

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[12] A.E.F. Heydorn The Rock Lobster of the South African West Coast Jasus lalandii (H. Milne Edwards) 1: Notes on the Reproductive Biology & The Determination of Minimum Size Limits for Commercial Catches (SFB, IR No.53, 1965): A.E.F. Heydorn The Rock Lobster of the South African West Coast Jasus lalandii (H. Milne Edwards) 2: Population Studies, Behaviour, Reproduction, Moulting, Growth & Migration (SFB, IR No.71, 1969) and B.I. Silberbauer The Biology of the South African Rock Lobster Jasus lalandii (H. Milne Edwards) 2: The Reproductive Organs, Mating & Fertilization (SFB, IR No.93, 1971);

[13] D.E. Pollock & C.J. de B. Beyers "Environment, Distribution & Growth Rates of West Coast Rock-Lobster Jasus lalandii (H. Milne Edwards)" in Transactions of the Royal Society of South Africa, 44, 3, 1981, pp.379-400 and D.E. Pollock & L.V. Shannon "Response of Rock Lobster Populations in the Benguela Ecosystem to Environmental Change - A Hypothesis" in South African Journal of Marine Science, 5, 1987, pp.887-899.

[14] See for example J.R. Grindley "The Cape Rock Lobster *Jasus lalandii* from the Bonteberg Excavation" in South African Archaeological Bulletin, 22, 1967, pp.94-102 and J.E. Parkington "Coastal Settlement between the Mouths of the Berg & Olifants Rivers, Cape Province" in South African Archaeological Bulletin, 31, 1976, pp.127-140.

[15] Cape of Good Hope Report of the Fisheries Committee 1892 [G.37-'92], Evidence of C. Poppe, p.47.

[16] Ibid., Evidence of H.R. Stephan, p.12.

[17] Ibid., Evidence of C. Schroeder, p.18.

a source of bait for catching of line fish[18]. For this reason commercial exploitation of the crayfish has historically concentrated on exporting it in canned and later frozen form as a cheap substitute for vanishing lobster on the European and American markets[19].

FIGURE 1 ABOUT HERE

The first Cape crayfish canning factories were established in the last quarter of the 19th Century and owed their initial success to "the unlimited supply [of crayfish] at nominal prices and ... the increasing scarcity of lobsters in America and Europe"[20]. Cheap raw material was no substitute for quality, however, and a succession of Cape Town-based concerns followed one another into bankruptcy on account of defective processing techniques[21]. An influx of expatriates with experience in the fishing and canning industries of Europe and North America, a shift in the American lobster industry from canning for export to freezing for the home market and the opening up of new crayfish resources at Hout Bay, Saldanha Bay and St Helena Bay, gave the fledgling Cape industry a new lease on life in the 1900s[22]. On the eve of the First World War there were eight factories in operation and both catches and exports to Europe had reached new heights. The "food for the poor" at the Cape was now "much in demand amongst the *bourgeois* class in Paris"[23]. Wartime food shortages in Britain and France accelerated these upward trends by pushing export prices steadily higher and giving added impetus to the expansion of the industry away from Cape Town. By the early 1920s the South African crayfish was firmly established on the European market and the canning industry was immune to the post-war resumption of foreign imports which extinguished a nascent wartime fish canning industry producing for the local market[24]. The export boom fuelled by rising prices peaked in 1922, however, and was followed by prolonged price recession, exacerbated by the devaluation of the

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[18] Ibid., Evidence of J. Combrinck, p.23 and Evidence of W.P. Boonzaaier, p.40.

[19] T.H. Huxley The Crayfish: An Introduction to the Study of Zoology (London. 1896), pp.10-11 Huxley estimated that Paris alone consumed 5-6 million crayfish annually in the 1890s valued at £16 000.

[20] Report of the Fisheries Committee, 1892, p.ix.

[21] W. Wardlaw Thompson Sea Fisheries of the Cape Colony (Cape Town, 1913), pp.85-87 and J.D.F. Gilchrist "The Cape Crawfish & Crawfish Industry" in Marine Biological Report No.1 [C.P.5-'13], 1913. pp.3-6.

[22] B. & E. Silverman Memoirs of a Pioneer in the Fish Canning Industry of South Africa (Cape Town, 1956), pp.12-18; F. Gill Ovenstones: A Story of the Sea (Cape Town, 1958) and S.C. Townell "The Crawfish Industry of the Cape West Coast 1874-1947" (Unpublished Honours Dissertation, University of Cape Town, 1977), pp.28-33.

[23] W. Wardlaw Thompson Sea Fisheries of the Cape Colony, p.86.

[24] Union of South Africa, Fishing Harbours Committee General Observations & Conclusions in Respect to the Fishing Industry of the Cape Province, 1927, pp.75-76 and Cape Archives [CA]: PAN 71; K59\22.

franc and growing competition from Japanese canned crab on the French market[25].

The steady fall in prices and declining catches on the Cape Peninsula and southern west coast squeezed company profits, spurring a search for new sources of raw material and opening a moving crayfish frontier on the west coast. New factories were established at Lamberts Bay and Port Nolloth in 1918 and Luderitz, in the newly acquired mandate territory of South West Africa, in 1922. These were followed by others at Hondeklipbaai (1925) and Doringbaai (1927)[26]. The old Cape Town industry declined swiftly as a result of falling catches and relocation. Plant and machinery was shipped north and factories converted into can-making and warehousing facilities for the isolated new production outposts north of St Helena Bay. Fleet motorisation also gathered momentum, the oar- and sail-powered open boat fishery giving way rapidly by the mid-1920s to a system of fewer and larger motorised decked boats, each "mothering" its own fleet of dinghies[27]. These changes created a growing north-south divide in the industry between the southern canners, burdened with ever more severe raw material shortages and rising production costs, and their northern counterparts, with easy access to cheap raw material and a profit per case averaging 15s by the late 1920s[28]. The latter were able to meet Japanese competition head-on, cutting prices to retain their market share, but the ensuing prices wars threatened the struggling southern companies with bankruptcy as their already narrow profit margins were squeezed into the red. In desperation they formed the South African Lobster Canners Association (SALCA) in 1928 to control output at home through a production quota and maintain a minimum price abroad which allowed all canners to show a profit[29]. Despite initial successes, the SALCA failed to win full industry support. The refusal of the largest South African canning company and South West African industry to abide by its production and price controls soon undermined the Association as the central state turned a deaf ear to requests to legislatively enforce the latter on recalcitrant[30].

The onset of the Depression, the Gold Standard crisis and the development of a crayfish freezing industry in Cape Town saw the collapse of the SALCA in 1931 and

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[25] S.C. Townell "The Crawfish Industry of the Cape West Coast 1874-1947", pp.50-53.

[26] R. Lees Fishing for Fortunes (Cape Town, 1969), pp.68-73.

[27] F.H. Sibson "The Crawfish Industry" in South African Journal of Industries, 8, 6, 1925, pp.359-362; Union of South Africa, Board of Trade & Industries Report No.180: The Fishing Industry, 1934, p.38 and C. von Bonde & J.M. Marchand The Natural History & Utilization of the Cape Crawfish, Kreef or Spiny Lobster Jasus (Palinurus) lalandii (Milne Edwards) Ortmann, pp.31-36. In 1934 the Board of Trade and Industries Reported that less than 10% of the total inshore fleet was motorised, the remainder still relying on wind and muscle power.

[28] State Archives [SA]: HEN 1538; 180\2\1(1), Report of the Cost Accountant for the Board of Trade & Industries "The South African Crayfish Canning Industry", 16 November 1931, pp.6-12.

[29] Ibid., pp.12-19.

[30] Report No.180: The Fishing Industry, 1934, pp.62-64 and SA: HEN 1538; 180\2\1(1).

severely destabilised the French market. In response to a worsening balance of trade with South Africa, protests from its langouste and colonial canning industries and complaints by French distributors about the declining quality of South African crayfish, the French government raised tariffs on crayfish and then imposed a crippling import quota in 1934, amounting to a mere fraction of annual exports in the early 1930s[31]. The closure of the canning factories and rising unemployment along the west coast created a minor political crisis for the South African government and forced it to finally intervene in the industry. Stop-gap legislation gave the state authority to allocate production quotas to individual companies while it hastily negotiated a reciprocal trade treaty with France which led to the easing of the quota ceiling in the latter part of the 1930s[32]. Research into improving the quality of canned crayfish also led to the industry standardising the use of lacquered tin plate for can making in the mid-1930s[33]. The canners search for alternative markets to compensate for the shrunken French market failed to bear fruit and as prices in France fell back to their pre-Depression low in the late 1930s, price wars re-emerged[34]. The nascent freezing industry, by contrast, pioneered a new market for its product in the United States after 1936. Because of their low overheads the packers were able to invest in large motorised vessels capable of staying at sea for a week at a time and fishing the most northern of the crayfish grounds. They also paid higher prices for crayfish and, in this way, drew both raw material and labour away from the beleaguered canning industry[35]. Despite these successes, however, the freezing industry was hampered by a poor quality product resulting in increasing Food & Drug Administration rejections and the threat of a total ban on frozen crayfish imports to the United states[36].

Thus by 1939 both sectors of the crayfish processing industry, organised under the banner of the South African Food Canners Council, were lobbying, for very different reasons, for direct state intervention in the industry to streamline

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[31] S.C. Townell "The Crawfish Industry of the Cape West Coast 1874-1947", pp.75-78 and pp.94-95.

[32] Union of South Africa House of Assembly Debates, vol.23, 1934, cols.3441-3442 and cols.4529-4536; Union of South Africa Extraordinary Government Gazette, No.2202, 7 June 1934, Crawfish Export Control Act (Act No.50, 1934); Union of South Africa Extraordinary Government Gazette, No.2272, 10 May 1935, Crawfish Export Control Amendment Act (Act No.41, 1935) and S.C. Townell "The Crawfish Industry of the Cape West Coast 1874-1947", pp.78-82.

[33] C. von Bonde & J.M. Marchand Studies in the Canning of the Cape Crawfish (Kreef or Spiny Lobster) Jasus lalandii (Milne Edwards) Ortmann (FMBS, IX No.5, 1935).

[34] Union of South Africa Report of the Select Committee on the subject of the Crawfish Export Bill 1939 [S.C.13-'39], Evidence of E.P. Smith, C. von Bonde & F.P. Spooner, pp.1-5 and R. Lees Fishing for Fortunes, pp.85-88.

[35] Union of South Africa FMBS Report No.11, 1933, p.18 and Report No.180; The Fishing Industry, 1934, p.59.

[36] FMBS Report No.13, 1935, p.40; FMBS Report No.16, 1938, p.149 and FMBS Report No.17, 1939, pp.79-80.

export marketing and control the quality of production. The central state, for its part, had abandoned its laissez-faire approach to the industry after 1936 when it assumed de facto responsibility for the management and development of marine fisheries from the provincial state's of the maritime provinces[37]. In 1939 it unveiled the Crawfish Export Act, making provision for both a single-channel marketing structure and state enforced quality controls, and addressing the two most immediate threats to the stability and continued profitability of the canning and freezing industries[38]. The Act laid the foundation stone of the modern crayfish industry and provided the legislative framework for the post-Second World War reorganisation of crayfish processing and export as a luxury item for the expanding middle classes of Europe and North America. It is against this background of the emergence and troubled development of the commercial exploitation of crayfish in South Africa that the history of its conservation needs to be seen and ultimately understood.

FROM CLOSED SEASONS TO SANCTUARIES

Early Conservation Measures c.1890-c.1906

By the late 19th Century crayfish was important only as "food for the poor" and bait and its apparent super-abundance seemed to guarantee its immunity from overfishing. The impact of commercial fishing on other marine resources, however, was much on the minds of colonial politicians and legislators in the 1890s. By that decade the snoek and mullet [harder] fisheries, which formed the mainstay of a thriving export trade to the sugar plantations of Natal and the Indian Ocean islands and an expanding "rantsoenvis" market in the South Western Cape, were in crisis due to falling catches. The Cape Town and west coast merchants who controlled the trade demanded legislative measures to protect these and other commercially important species from over exploitation[39]. Nor were they alone in wanting a greater state role in the fisheries. Their fellows in the Eastern Cape, denied participation in the lucrative Mauritian trade by virtue of their location far distant from the snoek resource, looked to railway links with the Rand to turn the rumoured deep sea wealth of the Agulhas Bank to profit. They wanted the colonial state to bear the cost of proving the Bank for commercial trawling by appointing a marine biologist and equipping a trawler for experimental fishing[40]. These diverse pressures led to the passing of the Fish Protection Act (1893) and the appointment of a Government Biologist (1896) and purchase of the

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[37] Union of South Africa Report of the Provincial Finance Commission [U.G.46, 1934]; Report No.180; The Fishing Industry, 1934, pp.78-84 and SA: HEN 1505: 180\1\20(1).

[38] Report of the Select Committee on the subject of the Crawfish Export Bill, 1939; House of Assembly Debates, vol.38, 1940, cols.3692-3699 and Extraordinary Government Gazette, No.2749, 10 April 1940, Crawfish Export Act (Act No.9 of 1940).

[39] See evidence in Report of the Fisheries Committee, 1892.

[40] See Cape of Good Hope Memorandum on the Development of Sea Fisheries, 1895 [G.61-'95].

steam trawler "Pieter Faure" (1897)[41]. Although crayfish hardly figured at all in the lengthy deliberations surrounding these events, it was nonetheless directly effected by them.

FIGURE 2 ABOUT HERE

The chief difficulty facing the colonial state in framing protective legislation was the lack of knowledge about any of the commercial fish species, including crayfish. From the contradictory evidence of canners, fishermen and others before the 1892 Commission, a vague picture emerged. The main features of crayfish biology (moulting, migration and berry females) were identified, but the exact timing of these different activities was the source of heated debate and speculation. One man, who relied on catching small crayfish from the Breakwater for sale in town, even argued that the fish he caught were a different species to the larger variety found elsewhere in the Bay[42]. To assuage merchant fears about the impact of canning on the bait supply, the colonial state included crayfish in the ambit of the Fish Protection Act[43]. In so doing it relied exclusively on the report of the 1892 Commission as guide in imposing a minimum size limit of three inches and a closed season for female crayfish from November to January each year. Because the intent was to protect the bait supply rather than the canning industry, neither of these controls applied to crayfish caught for bait purposes, leaving fishermen free to continue taking crayfish for fishing and food[44].

The appointment of J.D.F. Gilchrist as Government Biologist in 1896 did little to alter the conventional wisdom underpinning the legislation. Gilchrist graduated from Edinburgh University in 1894 with a doctorate in Zoology and spent a brief time at the Zoological Station in Naples, Europe's premier marine biological research facility, before accepting the post of government biologist at the Cape[45]. His primary task was to "prospect" for new deep water trawling grounds off the coast of the colony with the aid of the "Pieter Faure" and in 1896 he conducted a brief survey of Table Bay and False Bay to assess their suitability for trawling. In the course of reconnoitring Table Bay he found that "the crawfish supply is being considerably diminished in certain places" and, with canner support, recommended a longer closed season while still allowing fishermen to

[41] Cape of Good Hope Cape of Good Hope Government Gazette, No.7532, 29 August 1893. Fish Protection Act (Act No.15 of 1893), Cape of Good Hope, Department of Agriculture Report of the Government Marine Biologist January-March 1896 [G.52-`96] and Report of the Marine Biologist for the Year 1897 [G.53-`98].

[42] See Report of the Fisheries Committee, 1892, Evidence of J. Combrinck, p.23; Evidence of W.P. Boonzaaier, p.40 and Evidence of C. Poppe, pp.45-47 and Report of the Marine Biologist for the Year 1896 [G.41-`97], p.16.

[43] Cape of Good Hope Government Gazette, No.7557, 24 November 1893, Proclamation No.453 of 1893.

[44] Ibid. and CA: PAN 38; A120\e\5(2), L. MacLean to the Provincial Secretary, 29 March 1911.

[45] See W.J. de Kock (ed) Dictionary of South African Biography vol.I (Cape Town, 1968), pp.309-310.

catch crayfish all year round[46]. The close season was duly increased to three and a half months and extended to all crayfish, both male and female. In addition, canners were forbidden to catch or process berry females at any time in the year[47]. Gilchrist also quickly disproved the theory that there were two species of crayfish in Table Bay and was sceptical of the conservation value of the three inch minimum size limit. The marine survey, however, was chronically underfunded from its inception in 1896 to its demise in 1906 and had to pay its own way by selling the "Pieter Faure's" catch on the Cape Town market. Gilchrist also lacked proper research facilities ashore and it was not until 1902 that the St James laboratory at False Bay was completed[48]. The limited commercial importance of crayfish thus did not justify him spending research time and money investigating the size limit and the legislation remained largely unchanged until 1906. It was also seldom enforced, even in Cape Town. As Gilchrist lamented in 1899, "There is little or no supervision exercised over the sale of immature oysters or crawfish, and the same is to be said with regard to the close season for oysters and crawfish"[49]. The exemption of Namaqualand from the closed season was thus a purely token gesture which was a tacit admission of the legislation's lack of any scientific basis and limited reach. The system of honorary fishery officers inaugurated in 1896 never operated satisfactorily and had virtually collapsed due to financial cutbacks by the early 1900s[50]. The early conservation efforts of the colonial state thus only peripherally effected the commercial exploitation of crayfish which was in any event small-scale and largely unsuccessful. The canning industry itself remained unorganised and did not have representation on the Fisheries Advisory Board (FAB) appointed in 1896 to advise Gilchrist[51]. The latter devoted most of his time to the deep water survey and when he did turn his attention to inshore fishing it was to investigate aspects of the line and net fisheries. As a result the established 19th Century patterns of crayfish usage were little altered by state conservation measures.

FIGURE 3 ABOUT HERE

The Open Frontier c.1906-c.1927

All this changed after the mid-1900s as the canning industry revived and expanded beyond its Table Bay cradle, establishing beach heads at Hout Bay and Saldanha and St Helena Bays on the west coast. This expansion was motivated by the search for virgin crayfish grounds for commercial exploitation. As a result the industry's total catch quadrupled from an estimated 1200 tons in 1905 to 4800 tons by 1910 and did so again before the eve of the First World War, reaching 17500 tons in

[46] Report of Marine Biologist for January-March 1896, p.7 & p.9.

[47] Cape of Good Hope Government Gazette, No.7750, 1 October 1895, Proclamation No.393 of 1895.

[48] J.D.F. Gilchrist "The Marine Biological Laboratory at St James" in Marine Biological Report No.3 [C.P.3-1916], 1916, pp.48-55.

[49] Report of the Marine Biologist for the Year 1899 [G.23-1900], p.11.

[50] Compare Report of the Marine Biologist for the Year 1896, p.6 with Report of the Government Biologist for the Year 1902 [G.59-1903], p.9.

[51] Report of the Marine Biologist January-March 1896, p.2.

1914[52]. An eight fold increase in less than a decade sparked widespread fears of overfishing and the Cape industry following the same road to ruin as the lobster canning industries in Europe and America[53]. Fears of resource decline and industry collapse remained the peculiar concern of the Cape Town industry for the next decade and a half. The new factory owners on the west coast, in contrast, saw only "several hundred miles of Crayfish-yielding coast where the fish are not to be counted by the thousand, but by the million"[54]. The old lie of inexhaustible abundance, so glibly told about Table Bay in the 1890s, was now transposed onto the new west coast frontier where the fish were believed to "carpet" the seabed for more than 200 miles north of Saldanha Bay[55]. Developments during the First World War reinforced these contradictory perceptions of a resource simultaneously in decline and super abundant. By 1920 the number of canning factories had doubled from 8 in 1914 to 16 and the catch topped 25000 tons. The Cape Town industry's share of the wartime boom, however, halved, from 60% of the catch in 1915 to a mere 26% by 1920. By 1928 it had collapsed altogether, accounting for a minuscule 8.5% of the total industry catch in that year[56]. All eyes now turned to the open west coast frontier which leap-frogged rapidly northwards from its pre-war outpost at St Helena Bay to Port Nolloth by 1918 and Luderitz four years later. In its wake it left the by now familiar blight of overfishing. Thus in 1926 St Helena Bay canners, who stood on the very threshold of the resource frontier just a decade before, reported that "originally good-sized [crayl]fish could be found in large numbers in the bay, but that in recent years the size has decreased, till now nothing but undersized fish and fish on the edge of the size-limit are obtainable"[57]. The spectre of resource depletion thus dogged the industry's every footstep on its march towards the ever receding frontier of inexhaustible abundance. It also profoundly shaped state and industry ideas on crayfish conservation, creating increasing tension between the latter's demand for untrammelled access at the frontier and the former's insistence on the need for stricter controls in its wake.

This ideological difference played itself out over the issue of a close season. Initially imposed to protect female crayfish in berry, it was extended in 1895 to

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[52] See Figure 1.

[53] J.D.F. Gilchrist "The Cape Crawfish and Crawfish Industry", p.2; "A Crayfish Prospectus: Interesting Information Concerning the Industry" in The South African Review, 14 March 1913 and "The Fishing Industry: Signs of Gradual Diminution of Supply, Government Action Urgently Required" in South African Commerce and Manufacturers Record, February 1916.

[54] CA: PAN 38; A120\e\5(3), Stephan Brothers to the Administrator, 4 September 1913 forwarding report of C.H. Cook.

[55] Ibid.

[56] CA: PAN 37; A120\e\3(1), "Return showing the Number of Crayfish Captured and the Number of Boats Employed in the Capture of such Fish during the Years 1913 to 1918; PAN 42; A120\e\36, "Annual Return shewing the Number of Crayfish Caught for the use of the Canning Factories of the Cape Province", 1916-1921 and FDS; FS8\6\1, Return headed "Crawfish - 1928".

[57] CA: PAN 41; A120\e\24(2), F.H. Sibson to the Secretary of the Crawfish Survey Committee, 13 April 1926.

cover all crayfish and, in its new guise, served to chiefly protect male fish during the annual moult. This seems to have won a degree of legitimacy with the industry, probably because it roughly conformed to the actual moulting period in Table Bay and was not conscientiously enforced. With the establishment of new factories at Hout Bay, Saldanha Bay and St Helena Bay in the 1900s, however, the measure's already tenuous and conditional legitimacy collapsed under a new and relentless assault from the industry. Aside from its doubtful effectiveness and dubious conservation value, the close season imposed four months of enforced idleness on the canning industry. As one company complained, "the present close season regulations are oppressive and a restriction on trade", pointing out that;

> "[I]n canning operations an expensive plant and a permanent staff of skilled employees is necessary and when, in addition to the uncertainty of the weather throughout the year, a close season of 3 1\2 months is insisted on, operations are carried out under great difficulties and often at a loss"[58].

In addition to being unsound economically and threatening the survival of the fledgling industry, the close season exacerbated the existing problem of lost production time due to the variability of the weather and the resource, as well as the annual winter snoek season[59]. The canners estimated that such "natural factors" cost them a further third of the year, in addition to the third lost to the close season. For these reasons they maintained that any further restriction on secondary production was only justified if it fulfilled a useful conservation function. This the close season manifestly failed to do, protecting the resource when the faster-growing male crayfish were moulting and thus in any event unavailable to baited nets, while leaving the slower-growing and berry females vulnerable to both fishing and the abuses of the bait concession[60]. In addition, the industry argued, soft-shelled fish were unsuitable for canning and it could thus be relied on to regulate itself in this regard. The state effort should rather concentrate on the effective enforcement of the minimum size limit and protection of berry females[61].

The colonial state, for its part, was well aware of the employment and export potential of the industry and prepared to negotiate the specifics if not the principal of the matter with the canners. Thus while it continued to insist on four months closure it was not unsympathetic to the industry's "immediate pressing needs" and instituted separate close seasons for Hout Bay and the west coast in

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[58] CA: PAN 38; A120\e\3(1), North Bay Canning Company to the Minister of Agriculture, 28 September 1908.

[59] CA: PAN 37; A120\e\3(1), Return shewing the Number of Crayfish Captured and the Number of Boats Employed in the Capture of such Fish during the Years 1913 to 1918 and PAN 39; A120\e\5(5), H. Scharmberg to J.G. Reid, 15 January 1918 & Hickson & Sons to the Provincial Secretary, 26 September 1918.

[60] J.D.F. Gilchrist "The Cape Crawfish and Crawfish Industry", p.42.

[61] See for example CA: PAN 38; A120\e\5(2), North Bay Canning Company to the Secretary for Agriculture, 4 March 1909.

1906[62]. A precedent of ad hoc state concessions to industry demands was thus established. The lack of scientific or conventional knowledge of the crayfish resource at these places, however, made the setting of exact dates difficult and the situation remained unresolved in 1910, when stewardship of the marine resource was transferred from the colonial state to its provincial successor. The latter resuscitated the defunct fisheries bureaucracy, appointing Gilchrist Fishery Adviser, reconstituting the FAB with canning industry representation and taking over the St James laboratory from the South African Museum. It also retained the old colonial state fisheries legislation intact and so inherited the close season problem from its predecessor[63]. Lengthy discussions between the provincial authorities and industry between 1910 and 1913 fine-tuned the timing of the three close seasons, but in the absence of objective evidence they remained vulnerable to industry manipulation as companies jockeyed for competitive advantage[64]. The canners were divided on the issue of multiple close seasons, with the more vulnerable Cape Town factories favouring a uniform close season and the Hout Bay and west coast companies insisting on separate close seasons[65]. The latter allowed considerable room for manoeuvre. Individual firms regularly won exemptions on the grounds of assisting in the gathering of information on the resource or simply the contingency of the fish remaining in good condition. This led to immediate calls for similar concessions in all the other areas, necessitating annual revisions, disrupting supply contracts and undermining forward planning[66]. Even when such concessions were refused, the system of staggered close seasons and their weak enforcement (especially on the west coast), allowed companies to poach in adjacent closed areas and continue operating after their own area was closed to fishing[67]. With the onset of the wartime boom these problems intensified, as new companies entered the industry and export prices rose steadily. The "special" conditions of the war and the industry's contribution to the war effort as a food supplier to beleaguered Europe became a standard justification for blanket concessions on the close season until 1918[68].

The provincial state was hard-pressed to resolve these problems or control abuses.

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[62] Report of the Government Biologist for the Year 1906 [G.34-1907], p.2.

[63] Cape Province Province of the Cape of Good Hope Official Gazette, No.86, 17 March 1911, Fisheries Ordinance (Ordinance No.12 of 1911).

[64] CA: PAN 38; A120\e\5(2), Secretary of the FAB to the Administrator, 4 October 1910 forwarding responses of canning companies to close season and "The Protection of Crayfish - Official Inquiry Opened in Cape Town - Demand for a Close Season" in South African News, 4 October 1913.

[65] Ibid.

[66] See for example CA: PAN 38; A120\e\5(3), Hout Bay Canning Company to the Provincial Secretary, 9 August 1913.

[67] CA: PAN 38; A120\e\5(2) John Ovenstone to the Provincial Secretary, 25 October 1910 and PAN 39; A120\e\5(4), Stephan Brothers to the Administrator, 4 March 1914 & Fishery Officer to the Chief Clark, 8 October 1915.

[68] CA: PAN 39; A120\e\5(4), Provincial Secretary to the FAB, 15 February 1917.

It needed industry support to do so and was powerless to compel factories to shut down when their particular area was closed to fishing. It thus tightened up legislative controls in other areas. Following tagging and other investigations by Gilchrist in Table Bay in 1912-1913, it revoked the bait concession on berry females and raised the size limit to 4 inches[69]. Unlike the close season, which constrained canning production, these measures were chiefly directed at controlling primary (fishing) production. Industry acquiescence, however, did not denote compliance, as the authorities found to their dismay when the Fishery Officer started regular raids on Table Bay canneries in 1916-1918. Both fishermen and factories, inured to years of lax enforcement, regularly caught and processed a significant percentage of both undersize and berry fish. The vigorous policing of the Table Bay industry provoked a backlash of fishermen strikes and industry denials which accounts, in part, for the lack of a similar campaign on the west coast[70]. It is safe to assume that here too the minimum size and berry restrictions were less than rigorously observed and all canners bent the rules to compensate for lost production time during bad weather or simply to maximise their returns during the boom[71]. Gilchrist's investigations into the life history of the crayfish after 1912 also raised hopes of artificially rearing crayfish in hatcheries to restock depleted grounds and free the industry once and for all from effects of its own avarice. By 1918, however, these hopes had faded as all attempts to rear phyllosomata beyond a certain stage failed[72]. The absence of such phyllosomata in seas off the Cape also confounded Gilchrist, who assumed that the crayfish was a basically sedentary species confined to inshore waters. The larval pool of phyllosomata circulating in the mid-Atlantic was only discovered more than a half century later, but the hatchery idea was shelved and attention returned to controls on human exploitation. The death of the Fishery Officer in the 1918 Spanish influenza epidemic and Gilchrist's appointment the following year as director of the new deep water fisheries survey, however, effectively terminated research into the crayfish resource after 1918.

By then overfishing of the Cape resource was self-evident and the industry had turned to the west coast in search of new supplies of raw material, reopening the close season debate. With the establishment of factories at Lamberts Bay and Port Nolloth in 1918, this centred on the purely nominal close season north of St Helena Bay. The provincial state insisted on its retention with minor modifications, while the canners protested the measure's lack of any scientific basis and detrimental effect on new capital investment[73]. They favoured continuing the wartime trend of conserving the female breeding stock through the establishment of protected breeding and nursery areas, permanently closed to

[69] Province of the Cape of Good Hope Official Gazette, No.309, 3 April 1914, Proclamation No.73 of 1914

[70] See correspondence in CA: PAN 37; A120\e\3(1).

[71] See for example CA: PAN 37; A120\e\3(1), Provincial Secretary to the FAB, 13 April 1916 and Secretary of the FAB to the Provincial Secretary, 1 May 1916.

[72] J.D.F. Gilchrist "Crawfish Investigations, Including Experimental Hauls, Artificial Rearing and Migratory Movements of the Cape Crawfish (Jasus lalandii) in Province of the Cape of Good Hope" in Marine Biological Reports No.4 [C.P.3-1918], 1918, pp.6-8 and CA: PAN 42; A120\e\29.

[73] See correspondence in CA: PAN 39; A120\e\5(5 &6).

fishing. In 1918 six such sanctuaries were identified and proclaimed, but the provincial state viewed this as an additional conservation measure to the close season and refused demands to abolish the latter[74]. It further limited public access to the resource in 1920, abolishing the long-standing bait concession and restricting it to a few permit holders. The sanctuaries, however, were never beaconed or enforced and by the early 1920s had fallen into de facto disuse[75]. As a result, the failure of one of the Lamberts Bay factories (1919) and the teething problems of the others were blamed on provincial state intransigence over the close season and severely strained relations with the industry. Finally, in 1921 the provincial authorities relented and agreed to shift the close season to cover the winter months when the females were moulting and in berry while retaining the system of multiple seasons. This concession did little to improve relations with the industry, however. These deteriorated even further the same year with the imposition of a controversial provincial tax on canning company profits[76]. The new tax coincided with the downturn in prices on the European market and the money went into the general account and was not ear-marked for crayfish research. This was an especially sore point with the industry in view of the post-war conflict over the northern close season, collapse of the sanctuaries and the resurrection of the fisheries survey by the central state in 1920. The latter, like its predecessor, focused exclusively on the proving of new deep water fishing grounds for the trawling industry, but for the canners it served as an example of all that was wrong with provincial state management of the crayfish resource[77].

In 1924 the industry approached the central state for assistance in conducting research into the close season. The Department of Mines and Industries, although sympathetic, pleaded poverty and the canners agreed to a self-imposed levy to fund their own research[78]. The industry had assisted the colonial and provincial state's with money and boats for research since the 1900s and now mounted their own Crawfish Survey. A Royal Navy lieutenant, F.R. Sibson, was appointed "crayfish observer" and an old yacht, the "Carol", purchased to serve as his survey vessel. His brief was to provide the industry with hard evidence on the breeding and moulting patterns of the crayfish along the west coast which could be used to settle the close season debate once and for all[79]. Neither Sibson, the "Carol"

[74] Province of the Cape of Good Hope Official Gazette, No.548, 15 February 1918, Proclamation No.15 of 1918 and CA: PAN 40; A120\e\24(1), Secretary of the FAB to the Provincial Secretary, 19 September 1917 and Minutes of Meeting of FAB, 5 February 1918.

[75] CA: PAN 40; A120\e\24(1), J.G. Reid to the Fishery Officer, 28 February 1922.

[76] Province of the Cape of Good Hope Official Gazette, No.784, 3 February 1922, Provincial Crayfish Profits Tax Ordinance (Ordinance No.22 of 1921) and correspondence in CA: PAN 4; CFT2 & PAN 42; A120\e\31(1).

[77] H. Warington Smyth "The South African Fisheries Survey" in South African Journal of Industries, 3, 8, 1920, pp.694-699.

[78] CA: FDS 2; MIC178\24, Minutes of Meeting between Department of Mines & Industries and the Canning Industry, 9 September 1924.

[79] CA: FDS; MIC74\25, Minutes of the First Meeting of the Crawfish Survey Committee, 11 November 1924.

nor the industry were up to the task. As prices plummeted on the French market funding dried up and in 1926 the "Carol" was sold after a succession of engine and crew problems. Sibson persevered until 1928, but without a reliable vessel, was unable to institute a systematic programme of research. A perceptive observer, his monthly reports nonetheless provided accumulative evidence that the industry avoided canning soft-shelled fish and that the new winter close season was unnecessary on account of the rough weather and snoek season which precluded all crayfish fishing[80]. The latter was in any event under renewed assault from the industry as prices fell in Europe forcing lay-offs and factory closures along the west coast and allowing canners to wring concessions from the provincial state on humanitarian grounds. The beleaguered Cape Town industry even succeeded in getting a temporary reduction in the size limit in 1925-1926 to aid its fishermen[81]. In addition, the motorisation of the fleet and decline of the open boat fishery in the 1920s both contributed to the rising unemployment along the coast and undermined the old multi-season policy by allowing boats to range across several areas with impunity.

FIGURE 4 ABOUT HERE

In response to these new challenges the provincial state gave ground rapidly from the mid-1920s, retreating into an ever more narrow definition of its original "preservation" mandate. Following Gilchrist's death in 1926 it scrapped the post of Fishery Adviser and the following year disbanded the FAB and, on the recommendation of Sibson and the new head of the fisheries survey, Cecil von Bonde, suspended the close season indefinitely[82]. The sanctuaries proclaimed in 1918 were revived and the provincial authorities contented themselves with exercising a nominal control over these areas. The canners too shifted their attention from resource to production and marketing issues after the abolition of the close season. The Crawfish Survey was abandoned in 1928 and with the formation of the SALCA the focus shifted to issues of output and a minimum price. The resource was now open to fishing all year round, with the exception of a few areas (sanctuaries), and within the limits set by the size and berry proscriptions. None of these were effectively enforced, however, and the frontier appeared to have triumphed over the sustained, but ineffectual attempts of successive regional states to close it or reign in the competitive capitalism which was its motor.

Closing the Frontier c.1927-c.1939

The open crayfish frontier defended by the industry up to 1927, however, created growing divisions between the old centres of production in the south and the newer frontier outposts in the north. The former lost ground rapidly after 1927 as

[80] FMBS Report No.6, 1928, p.8 and CA: FDS; MIC169\25 (1 & 2), F.H. Sibson, Crawfish Survey Monthly Reports, 1924-1926.

[81] See for example fishermen petitions and canning company correspondence in CA: PAN 37; A120\e\3(2) and PAN 40; A120\e\5(6).

[82] Province of the Cape of Good Hope Official Gazette, No.1063, 17 December 1926, Proclamation No.110 of 1926 and CA: PAN 40; A120\e\5(8), North Bay Canning Company to the Administrator, 5 December 1926 forwarding "Crawfish Survey Monthly Report November 1926" and C. von Bonde to the Provincial Secretary, 10 March 1927 forwarding "Report on the Desirability or Otherwise of a Close Season for Crawfish".

output sky-rocketed and price-cutting intensified on the French market compelling them to try and close the frontier with the aid of the central state. Increased Japanese competition on the French market and wild rumours of foreign factory ships canning crayfish outside Union territorial waters led to the formation of the SALCA in 1928. In addition to legislatively enforcing a production quota and minimum price, the Association called for a moratorium on the construction of new canning factories and thus the effective closing of the west coast crayfish frontier. Its motivation for the latter was that the crayfish resource was depleted and in danger of overfishing[83]. At the same time, however, SALCA members pressured the fisheries survey to relax the existing conservation legislation to enable them to maintain slipping catches and remain competitive in an increasingly volatile export market. Both the Cape Town sanctuaries were thus permanently opened to fishing for three months in the year from 1927, with occasional ad hoc extensions. So too the St Helena Bay sanctuary, which was opened for short periods to fishing by oar and sail vessels between 1931 and 1934. In addition, the fisheries survey approved a half inch reduction in the minimum size limit for the canners on the southern west coast and only in 1931 extended this to the industry as a whole[84].

The SALCA's new-found conservation consciousness was thus primarily motivated by a desire to prevent potential competitors gaining access to the resource and did not hinder its own intensified exploitation of the same. It thus pursued the closing of the frontier to others to maintain it as an exclusive preserve for itself. Key to this endeavour was an official system of controlled access. The provincial state had contemplated, but never introduced, a licensing system for the canning industry similar to that which applied to whaling factories. In its absence all that was required was for a prospective canning factory operator to acquire leasehold rights to a portion of coastal (public) land from the Department of Lands in Pretoria. This was invariably granted without reference to either the provincial authorities or the fisheries survey[85]. The SALCA thus looked to the fisheries survey to remedy this situation after 1928. The latter fell under the Board of Trade and Industries, however, which maintained a strict laissez-faire stance towards the industry, advocating expansion and a competitive ethic in the belief that the crayfish resource could sustain intensified exploitation and that the industry was therefore capable of further development. The SALCA, however, found an ally in the director of the marine survey. Cecil von Bonde was a protegee of Gilchrist at the South African College and succeeded his mentor as head of the fisheries survey in 1926[86]. A firm believer in modernisation and the vanguard role of science in the development process, he sought to restructure the survey around the needs of the inshore fisheries. In this regard he was an outspoken critic of the fragmentation of state authority in the industry and advocate of a

[83] CA: FDS 5; FS3\10, F.H. Sibson to the Secretary of the Fisheries Survey Committee, 27 October 1927 and correspondence in SA: HEN 1538, 180\2\1(1).

[84] See Figures 2 and 3.

[85] See correspondence in SA: HEN 1538; 180\2\1(1).

[86] "Departmental Personalities No.6: Dr C. von Bonde, Director of Fisheries" in Commerce & Industries, January 1948, p.150 and Obituary in South African Journal of Marine Science, 1, 1983, pp.1-2.

national Bureau of Fisheries[87]. For all these reasons von Bonde was sympathetic to the SALCA's concerns about unbridled industry expansion and resource depletion. Having failed to convince either the provincial authorities or his own department to block new entrants into the industry he negotiated a moratorium on the leasing of land for new factories with the Select Committee on Public Lands in 1932. Earlier, he secured the agreement of the South West African administration to check similar expansion in its territory, thereby closing the frontier at Luderitz as well[88].

The closing of the west coast frontier came to late to save the SALCA and failed to check the expansion of the freezing industry which, by the early 1930s, had replaced internecine rivalry as the chief threat facing the canning industry. The abolition of the close season in 1927 unleased a production boom which continued until 1932. From 27000 tons in 1927, itself a record, the catch rose to 36 500 tons in 1930 and a staggering 50000 tons two years later[89]. The canning industry accounted for only part of this increase, as Cape Town fish merchants and others, encouraged by the removal of state restrictions, flocked to the open frontier and began freezing crayfish for export. Because of their low overheads, they were able to outbid the canners for both the labour and raw material by offering higher prices for crayfish. They also invested heavily in boats capable of working the most northern grounds from Cape Town and thus posing a threat to all sectors of the canning industry. Abroad, their product entered the French market under the same customs head as the canned article and undercut the French langouste, prompting France to raise tariffs on crayfish imports and further undermining the canners ability to compete with Japanese canned crab[90]. The canners, organised in the SAFCC after 1933, thus launched a concerted campaign to have the freezing industry closed down and again used overfishing as their Trojan Horse. The SAFCC argued that the canning industry had a historical claim to precedence over the new interlopers, a far larger capital investment in plant and machinery and employed a bigger workforce which would be unemployed if the industry collapsed. More importantly, the freezing trade was not only overfishing the resource, but destroying the long term productivity of the crayfish grounds through its practice of "tailing" the fish and dumping the bodies at sea. This was held to scare the surviving crayfish away and ruin the grounds for further fishing[91]. The fisheries survey was sympathetic to all these arguments and in 1933 tightened up the conservation legislation to curb this practice and the growth of the freezing trade in general. All industry and public access to the designated crayfish sanctuaries was revoked and in 1934 Hout Bay was added to the list of prohibited fishing areas. Secondly, the "tailing" of fish at sea was made illegal by a regulation requiring crayfish to be landed in a whole state. Thirdly, the dumping

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[87] See for example FMBS Report No.7, 1929, pp.4-10 and C. von Bonde "The Correlation between Marine Biology and the Problems of the Fishing Industry" in South African Journal of Science, 28, 1931, pp.42-50.

[88] See correspondence in SA: HEN 1538; 180\2\1(1).

[89] See Figure 1.

[90] S.C. Townell "The Crawfish Industry of the Cape West Coast 1874-1947", pp.87-103.

[91] Report No.180: The Fishing Industry, 1934, pp.60-61.

of crayfish offal at sea was prohibited[92]. A further amendment, raising the minimum size back to the 4 inch limit, last in force in 1929, however, drew a storm of protest from the canners and it was immediately lowered back to 3 1\2. The proscription on dumping offal was also amended in 1934 to allow canning factories to continue their practice of dumping cooked offal into the sea off their jetties[93]. Thus, once again, the canning industry's concern with resource conservation masked narrow ulterior motives, in this case a desire to close down the freezing trade, and was pointedly not intended to constrain its own fishing and canning activities in any way.

The canning industry's privileged position was strengthened by the French quota crisis of 1934-1935. Not only did the central state legislatively intervene to ensure an equitable distribution of the reduced pack, but it negotiated a gradual increase in the canned quota, assisted the industry in locating new crayfish grounds along the west coast and provided the industry with scientific research to improve the quality of its product[94]. No such increases were secured for the packers, nor was research conducted on freezing processes and when the freezing trade brought South West African boats south to fish after 1936 they were banned from Union waters at the behest of the canners[95]. Increased state intervention, however, also brought with it a more effective implementation of the conservation legislation, particularly after Pretoria's de facto assumption of control over marine fisheries from the provincial state in 1936. The fisheries survey acquired a crayfish survey vessel, the "Jasus", in 1930, but was forced to sell it during the Depression due to budget cuts. Thereafter it relied on the deep water survey ship, the "Africana", shared with the navy hydrographic survey, to conduct investigations on the crayfish grounds and tag fish. Its enforcement capability was limited to the Cape Town police launch "Mauritania" which was slower than the average crayfish boat, manned by an inexperienced crew and had a very limited range[96]. The fisheries survey thus looked to the industry to assist it in enforcing the law. The canning industry, however, still depended on lax enforcement to routinely circumvented restrictions on primary production and, in the context of a shrunken export market, falling prices and continued competition from the freezing industry, continued to do so with impunity. As the Board of Trade and Industries reported in 1934;

> "[M]ost canners accused each other of catching females in berry and soft and undersized fish, and [we] actually witnessed the arrival of catches including comparatively high percentages of undersized fish and females in berry. In one instance, the manager of a factory refused to accept a proportion of a catch on these grounds, but it was openly stated in evidence that when fish were scarce and times were bad the fishermen could not resist the temptation to circumvent the law, and it was very hard for a factory manager to accept a catch when

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[92] See Figures 1 and 4.

[93] CA: PAN 37; A120\e\3(4), SAFCC to the Provincial Secretary, 17 October 1933 and F.C. Erasmus to the Administrator, 25 August 1933.

[94] See Footnotes No. 30 and 31 above.

[95] See correspondence in CA: PAN 22; A120\b\150(5).

[96] FMBS Report No.12, 1934, pp.6-8; FMBS Report No.14, 1936, p.23 and FMBS Report No.16, 1938, pp.137-147.

> he was acquainted with the precarious circumstances at the homes of such fishermen"[97].

This spurious "humanitarian" argument had been successfully deployed by the industry since the mid-1920s to justify the relaxation of close season, size limit and sanctuary restrictions. By the latter half of the 1930s, with the end of the Depression and passing of the French quota crisis, the state was not amenable as it once was to this logic. The freezing industry, for their part, pioneered the United States market after 1936 and had no reason to voluntarily adhere to legislation which was unenforced and ignored by their competitors. Despite this von Bonde was optimistic that he could win industry support for conservation in return for expanded research into the crayfish resource. While conceding that such research was often classed with "crystal gazing and palmistry" he stressed that it was all that stood between the industry and the "wanton destruction" of the resource through overfishing[98]. The chief culprit in this regard was the fisherman "who does not feel pride or possession or responsibility for the various species he takes" and honoured the law "more in the breach than in the observance"[99]. On recent evidence the same was clearly more than true of the industry as well, but von Bonde continued to give it the benefit of the doubt and appeal for its assistance;

> In this very necessary and important work the Industry can be of material assistance to this Division by making it clear to their fishermen that the laws should be observed and by explaining to them in as much detail as possible why these laws were promulgated. It is felt that all employers of fishermen can do much more than they are doing at present to help, especially by refusing to take any fish which do not conform to the regulations as promulgated"[100].

The industry, however, was a doubtful ally, as von Bonde well knew and in 1936 he angrily reported that the Llandudno sanctuary had been "systematically raided and almost depleted of crawfish"[101]. Industry attempts to combat this problem, he complained, had been "too half-hearted" and some companies had actively encouraged the fishermen in their "nefarious practices"[102]. With the closing of the crayfish frontier, the sanctuaries were left-over, small pieces of frontier artificially preserved and maintained similar terrestrial game reserves. The temptation to poach was irresistible in the context of shrunken markets and fierce competition. Any impediment to production which increased costs by forcing boats to travel further afield in search of legal crayfish or starved a factory of raw material by denying it occasional recourse to sanctuaries or undersized and berry fish was thus unlikely to garner much popular support. Following the failure of

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[97] Report No.180: The Fishing Industry, 1934, p.60.

[98] C. von Bonde "Fishery Legislation, Conservation & Research: A Plea for Co-operation between the Industry and the Fisheries Survey Division" in Crawfish Canners' News Bulletin, 3, 1, 1936, pp.3-4.

[99] Ibid., p.1.

[100] FMBS Report No.13, 1935, p.36.

[101] FMBS Report No.14, 1936, p.24.

[102] Ibid.

self-regulation, von Bonde looked increasingly to state enforcement. In 1937 the fisheries legislation was strengthened to make it illegal to conceal the identity number of a fishing boat or withhold or give false information about the crew. In addition the police were empowered to stop boats at sea on suspicion of poaching and seize gear and the fines for all fishing offenses were substantially increased[103]. "The Gap", a favourite haunt of poachers between the Llandudno and Table Bay sanctuaries, was also closed[104]. The following year the fisheries survey's first crayfish patrol boat, the "Impala", was taken into service, replacing the antiquated "Mauritania"[105]. Armed with these new deterrents, von Bonde was able to curb poaching, but the canning industry remained an unenthusiastic partner and accusations of the catching and processing of poached, undersized and berried fish persisted until the war.

The issue of resource conservation and threat of overfishing were integral to the central state's closing of the crayfish frontier in the early 1930s and continued to dominate debates within the industry for the remainder of the decade. In the hands of the SALCA and SAFCC they were skilfully deployed to protect the canning industry's own economic interests by preventing new companies from entering the South African and South West African crayfish fishery and lessening the threat posed by the freezing trade. At no stage did this constrain canners from processing undersize or berry fish or discouraging their fishermen from poaching in the sanctuaries. The de facto right to self-regulation conceded by the provincial state in 1927 thus continued to mask a cavalier frontier mentality towards the crayfish resource on the part of both canners and packers. The central state's failure to gain more than token industry support for the stricter enforcement of the conservation legislation after 1936 reinforced the economic arguments for more direct state intervention in the crayfish industry itself. The problems of price instability, poor quality and resource depletion were thus increasingly seen as integrally related to the competitive capitalism which predominated in the canning and packing industries. The 1939 Crawfish Export Act, in addition to its quality and market controls, entrenched the state's authority to allocate exploitation rights to the resource[106]. This authority was used to weed the industry of "small capitalists" after 1946, conferring de facto ownership rights on a select few quota holders and guaranteeing them a remunerative return on their exports[107]. In this way, the state cemented a cost-effective alliance with private capital, built around the conservation of both the industry and the resource.

CONSERVATION & CAPITALISM

The marine resource poses particular problems to capital penetration, being at once resistant to forms of private tenure and subject to "natural factors" which militate against the establishment of a stable production regime. Historically,

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[103] Province of the Cape of Good Hope Official Gazette, No.1695, 7 May 1937. Fisheries Ordinance Amendment Ordinance.

[104] See Figure 4.

[105] FMRS Report No.16, 1938, pp.137-138.

[106] See Footnote No.36 above.

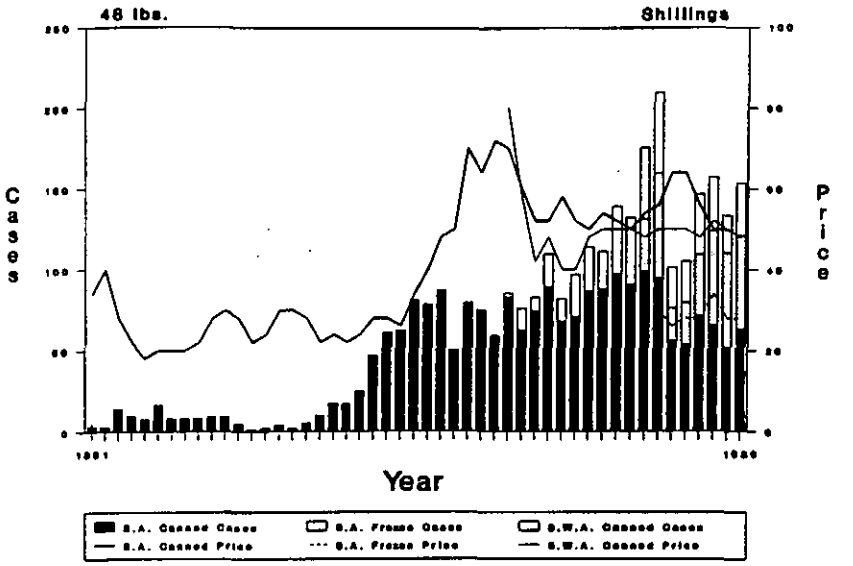
[107] SA: HEN 1558; 180\29\13\19, F.P. Spooner to the Acting Secretary for Commerce & Industries, 9 September 1946.

these factors have tended to favour particular kinds of capital over others, more specifically merchant over productive capital. The west coast crayfish, however, was unique in its relatively sedentary nature, confined to shallow water nearshore, and thus well-suited to exploitation by productive capital once initial problems of processing technique had been resolved. The sure abundance of crayfish more than offset the continued influence of such "natural factors" as weather and moulting on factory production. Indeed a super-abundance of cheap crayfish was the historical "comparative advantage" so judiciously exploited by the nascent canning industry to gain a foothold on highly competitive overseas markets. For this reason to it also steadfastly resisted all attempts by the state to exercise proprietary rights over the resource, on behalf of the "common interest", through limiting or controlling industry exploitation. In the period 1906-1927 this mainly took the form of an annual close season which threatened the industry with ruin by exacerbating the already heavy burden of "natural factors" on production time and hamstringing efforts to pioneer new sources of raw material on the west coast. Such state conservation efforts, quite literally, threatened the continued survival of canning capital. The fact that the peculiar life-history of crayfish, a part of which was spent drifting in mid-Atlantic, made it unsuitable to direct human manipulation through artificial rearing and restocking of the wild population merely reinforced this point.

By the late 1920s the "comparative advantage" of new and abundant crayfish resources had been permanently lost by part of the industry whose already precarious position was further threatened by the open frontier attracting more new entrants to the industry. These canners embraced resource conservation as a means of closing the frontier and thereby securing their exclusive right to exploit the resource After the closing of the frontier in 1932, the canning industry continued to deploy conservation as a means of defending their access to the crayfish resource against competition from other producers, particularly the freezing industry. Having secured their privileged position, however, they were still dependent on untrammelled access to the resource and continued to disregard conservation controls which in any way threatened their supply of raw material. With the intervention of the central state in the industry in the wake of the French quota crisis, however, these practices became increasingly problematic as conservation was more strictly and uniformly enforced. The conservation crisis of the late 1930s added to the quality and price problems abroad in deciding the state to rationalise and restructure the industry. It was only after the Second World War, with the state's granting of de facto ownership rights to the resource in the context of a single-channel export marketing structure, that the canning and freezing industry began to adopt a more conservationary attitude towards the resource, but by then their historical comparative advantage had be permanently lost.

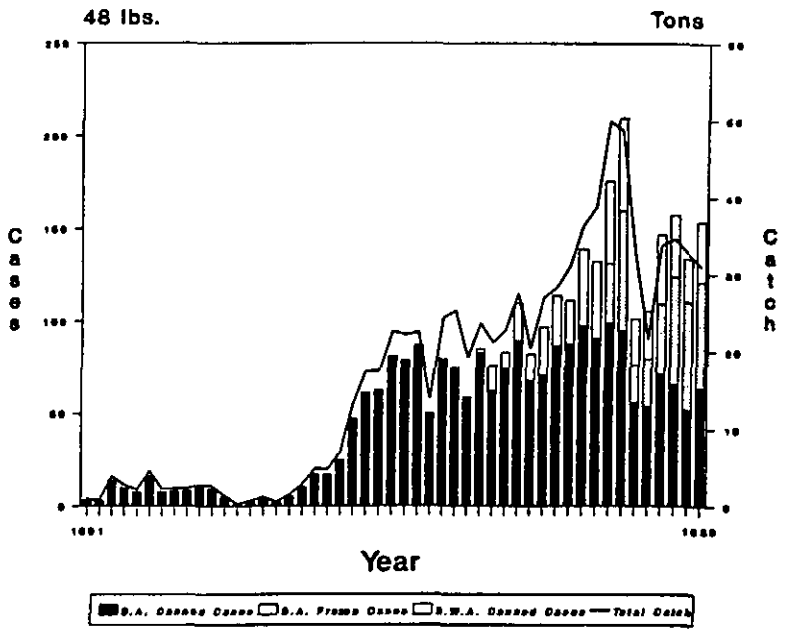
Figure 1

CRAYFISH EXPORTS 1891-1939



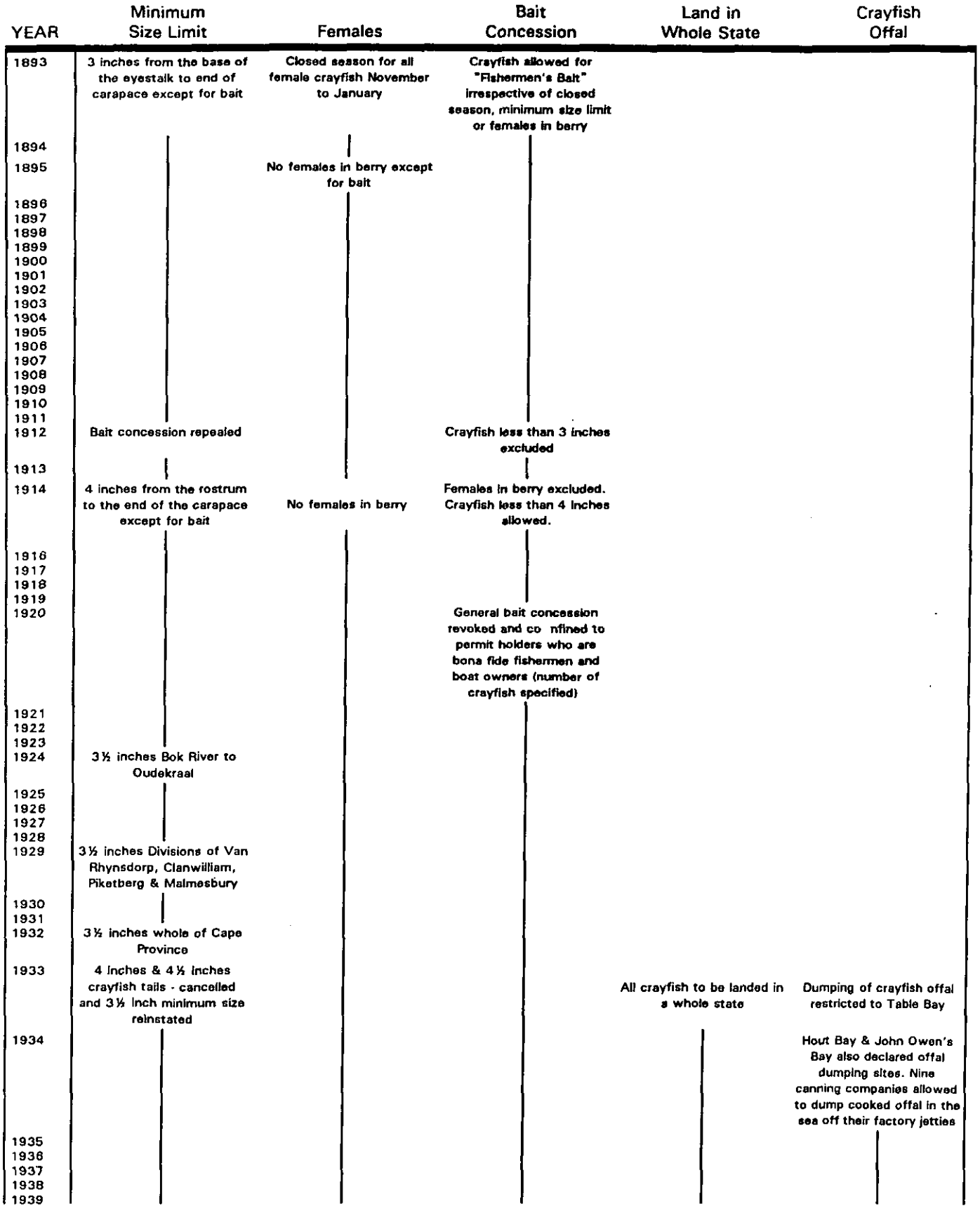
SOURCES: Own calculations based on data contained in W. Wardlaw Thompson, Sea Fisheries of the Cape Colony (Cape Town 1913) and Union of South Africa Department of Customs & Excise, Annual Statement of the Trade and Shipping of the Union of South Africa, 1910-1939.

TOTAL CRAYFISH CATCH 1891-1939



SOURCES: Own calculation based on data contained in W. Wardlaw Thompson, Sea Fisheries of the Cape Colony (Cape Town 1913) and Union of South Africa Department of Customs & Excise, Annual Statement of the Trade and Shipping of the Union of South Africa, 1910-1939.

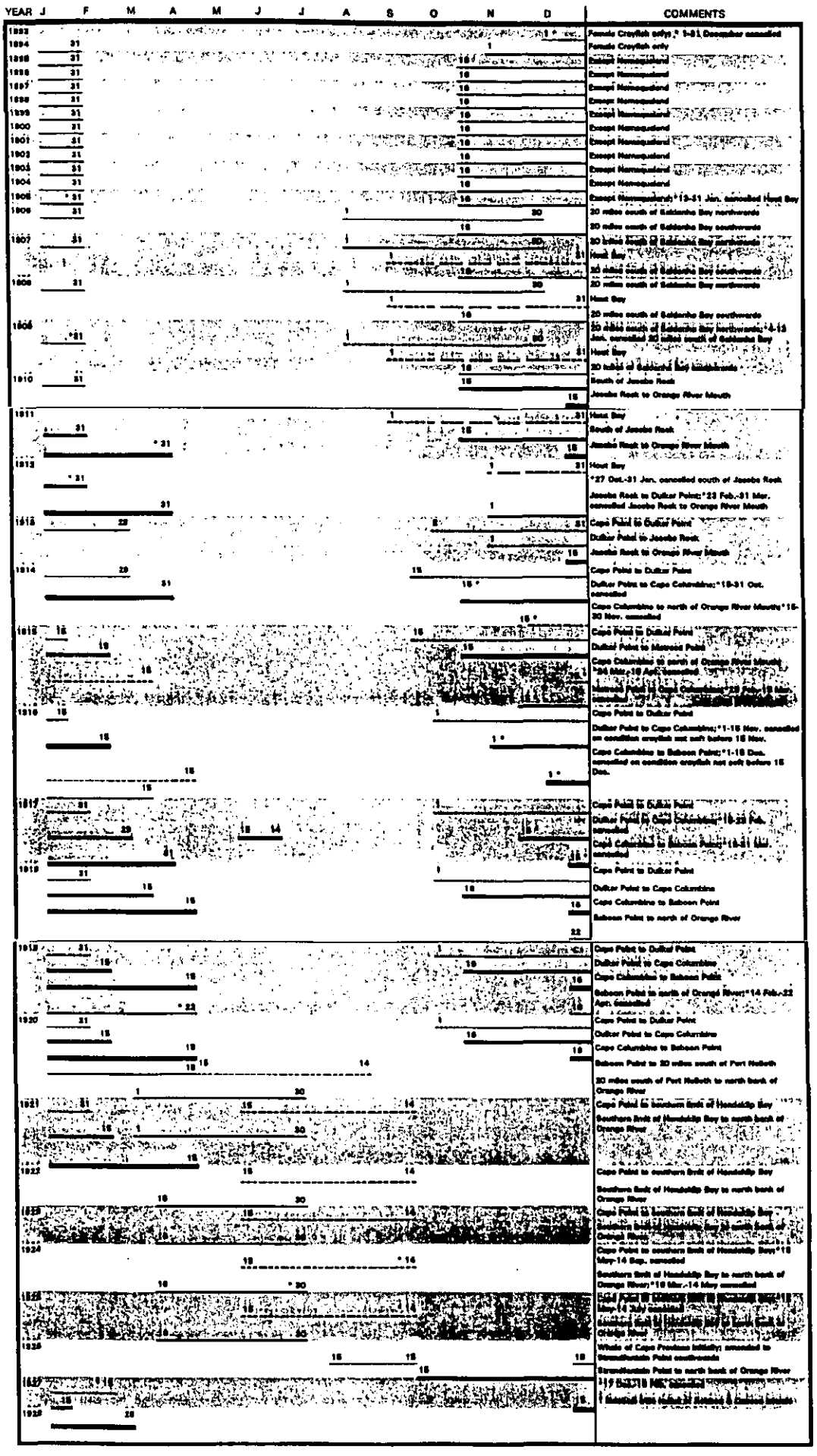
Figure 2
MISCELLANEOUS CRAYFISH CONTROLS
c.1893-c.1939



SOURCES: Cape of Good Hope Government Gazette, 1893-1909 and Province of the Cape of Good Hope Official Gazette, 1910-1939.

Figure 3

THE CRAYFISH CLOSED SEASON 1893-1927



SOURCES: Cape of Good Hope Government Gazette, 1893-1909 and Provinces of the Cape of Good Hope Official Gazette, 1910-1939.

Figure 4

CRAYFISH SANCTUARIES 1918-1939

SANCTUARY	ESTABLISHED	EXTENT	AREA	CONCESSIONS
Hout Bay	1934	Hout Bay	—	—
Llandudno	1918	Llandudno - Hottentots Huisje (1918) Sandy Bay - Hottentots Huisje (1928)	½ Nautical Mile (1918) 3 Nautical Miles (1928)	1929: Open to fishing 1/11-28/2 @ year 1930: Open season extended to 31/3/1930 1931: Open season extended to 15/5/1931 1932: Open season amended to 1/7-30/9 @ year 1933: Open season abolished
1937 LLANDUDNO & TABLE BAY SANCTUARIES AMALGAMATED FOR 3 YEARS				
Table Bay	1918	Disused Woodstock Sewer (1918) Three Anchor Bay - Diep River Mouth (1928) Bachelors Cove - Diep River Mouth (1928)	¼ Nautical Mile (1918) ½ Nautical Mile (1927) 3 Nautical Miles (1928)	1929: Open to fishing from Three Anchor Bay to Bachelors Cove 1/11-28/2 @ year 1931: Open season extended to 15/5/1931 1933: Open season abolished
Bok Bay	1918	Buffels River - Bok Point (1918)	½ Nautical Mile (1918) 3 Nautical Miles (1928)	—
Saldanha Bay	1918	North Bay (1918) Saldanha Bay inside North & South Heads (1927)	—	—
Jacobs Bay	1918	Jacobs Bay	—	1927: Disestablished
St. Helena Bay	1918	Steenbergs Cove - Wilde Varkens Vlei (1918) Britannia Point - Berg River Mouth (1927)	½ Nautical Mile (1918) 3 Nautical Miles (1928)	1932: Open to fishing by oar & sail boats 9/3/1932-9/6/1932 1933: Open to fishing by oar & sail boats 8/12/1933-31/2/1934 1936: Open to fishing by oar & sail boats

NOTES: 1929-1933: Fishing for crayfish in all sanctuaries permitted from the coast
1929: Sanctuaries established for 5 years [Proclamation No. 232, December 1929]
1934: Sanctuaries established for further 10 years [Proclamation No. 188, December 1934]

SOURCE: Province of the Cape of Good Hope Official Gazette, 1918-1939.