

A black and white photograph of an underwater scene. The top of the image shows the water's surface with light reflecting through. Below, a large school of fish swims in the mid-ground. In the foreground, a coral reef is visible, with various types of coral and smaller fish swimming around it. The overall atmosphere is serene and natural.

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# Appendices

## APPENDIX 1

### Stock Exploitation Status and Catch Ranges for Major Commercial Fisheries (Appendix 8 from Annual Report 2000/2001)

Fishery	Stock assessment complete	Exploitation status	Breeding stock assessment	Previous acceptable catch or effort range (tonnes/days)	*Catch (tonnes) current season	Year	Future acceptable catch or effort range (tonnes/days)	Year	Comments current season catch
<b>WEST COAST BIOREGION</b>									
Western rock lobster	Yes	Fully exploited	Adequate	13,500-14,500	14,523	99/2000	8,166-14,523	2000/01	Above forecast catch due to exceptional puerulus settlement 3-4 years previously.
Roe's abalone	Yes	Fully exploited	Adequate	116 (Q) (740-990 days)	107.7 (755 days)	2000	107.9 (725-929 days)	2001	New management plan now treats Roe's abalone as a single fishery.
South-West trawl	NA	NA	NA	Not available	Prawns 32 Scallops 23	2000	Not available	2001	Prawn catch is mainly king prawns.
Abrolhos Islands & Mid-West trawl	NA	Fully exploited	Adequate	250-400	429	2000	50-600	2001	Recruitment is dependent on environmental conditions each year.
Cockburn Sound	NA	NA	Not appropriate	40-95	56	2000	40-95	2001	Finfish only (excludes bait fish).
West coast purse seine	Yes	Fully exploited	Depleted	260	14	2000	NA	2001	Reduced catch due to mortality effect and limited availability of pilchard stock.
Estuarine fisheries (west coast)	Yes**	Fully exploited**	NA	Not available	305	2000	Not available	2001	Includes fish and crustaceans.
<b>GASCOYNE COAST BIOREGION</b>									
Shark Bay prawn	Yes	Fully exploited	Adequate	1,611-2,183	2,250	2000	1,501-2,330	2001	Higher than average king prawn catch due to high catchability linked to sea temperature.
Exmouth prawn	Yes	Fully exploited	Adequate	771-1,276	565	2000	771-1,276	2001	Tiger prawn recruitment levels reduced due to negative cumulative cyclone effects. King and endeavour prawn catches reduced by closures.
Shark Bay scallop	Yes	Fully exploited	Adequate	1,500-2,750	1,345	2000	1,250-3,000	2001	Catches remain at low end of range due to continuing negative environmental impacts on recruitment.
Shark Bay snapper	Yes	Fully exploited	Adequate	450-550 (Q)	488	2000	550 (Q) (820-950 standard days)	2001	Reduced catch due to low effort. Snapper catch only.
Shark Bay beach seine & mesh net	Yes**	Fully exploited**	Adequate**	95-140 (whiting)	127 (whiting)	2000	95-140 (whiting)	2001	Whiting catch only.
<b>NORTH COAST BIOREGION</b>									
Onslow prawn	NA	NA	NA	61-132	87	2000	60-130	2001	Higher summer rainfall gave improved banana prawn catches.
Nickol Bay prawn	NA	NA	NA	Banana prawn 300-500	Banana prawn 467	2000	All prawns 90-300	2001	Unusually high summer rainfall provided exceptionally high banana prawn catches
Broome prawn	Yes	Under-exploited	Adequate	King prawn 36-164	King prawn 76	2000	King prawn 35-170	2001	Fishing season matched to lunar-phase-driven recruitment patterns in order to achieve higher exploitation rates.
Kimberley prawn	NA	NA	NA	301-645	236	2000	240-500	2001	Banana prawn catch showed limited response to higher rainfall.
Pearl oyster	Yes	Fully exploited	Adequate	617,700 oysters <sup>1</sup> (Q) (15,331-22,599 dive hours)	568,191 oysters (15,151 dive hours)	2000	572,500 oysters <sup>1</sup> (Q) (15,331-22,599 dive hours)	2001	Quota in Zone 1 was not fully utilised owing to substitution of hatchery produced stock.

Fishery	Stock assessment complete	Exploitation status	Breeding stock assessment	Previous acceptable catch or effort range (tonnes/days)	*Catch (tonnes) current season	Year	Future acceptable catch or effort range (tonnes/days)	Year	Comments current season catch
<b>NORTH COAST BIOREGION (CONT.)</b>									
Pilbara trawl	Yes**	Fully exploited	Adequate	2,100-2,400	2,075	2000	1,900-2,200	2001	Assessment only includes major species.
Pilbara demersal trap & line	NA	Fully exploited	Limited data	300-400	316	2000	150-300	2001	Range for trap only as line is not restricted.
Northern demersal	NA	Fully exploited**	Declining**	600-1,000	470	2000	600-1,000	2001	Low catch due to low effort.
Kimberley gillnet & barramundi	Yes**	Fully exploited**	Adequate**	25-40 (barramundi)	45 (barramundi)	99/2000	25-40 (barramundi)	2000/01	Higher barramundi catch obtained although effort trending lower.
North coast shark	NA	NA	NA	NA	103	99/2000	NA	2000/01	Developing fishery. Lower catch due to redirection of effort.
Spanish mackerel	NA	NA	NA	260-390	305	2000	249-358	2001	Commercial catch of Spanish mackerel only. Range is preliminary estimate only, fishery yet to stabilise.
<b>SOUTH COAST BIOREGION</b>									
Esperance rock lobster	Yes	Fully exploited	Adequate	50-80	69	99/2000	50-80	2000/01	Catch figures and projections include the fishery's three management zones: Esperance, GAB and Albany.
Abalone (greenlip/brownlip)	Yes	Fully exploited	Adequate	235.63 (Q) (1,110-1,520 days)	223.37 (1,173 days)	2000	229.54 (Q) (1,110-1,520 days)	2001	Two zones previously managed separately now amalgamated into one fishery since 1999.
WA salmon	Yes	Fully exploited	Adequate	1,300-3,600	2,283	2000	1,300-3,600	2001	Environmental factors (Leeuwin Current) influence recruitment and catch levels in subsequent years.
Australian herring trap	Yes	Fully exploited	Adequate	450-1,200	818	2000	450-1,200	2001	South coast catch only.
Southern & west coast demersal gillnet & longline	Yes**	Fully exploited**	Adequate**	875-1,075**	785	99/2000	725-975**	2000/01	Key species only reported. Breeding stocks of two major species are adequate; whiskery shark catches have increased in two sectors which has reduced breeding stocks.
Estuarine fisheries (south coast)	Yes**	Fully exploited**	NA	200-500	252	2000	200-500	2001	Includes fish, molluscs and crustaceans.
Albany/King George Sound purse seine	Yes	Not applicable	Severely depleted	0	Not applicable	2000	50-100	2001	Fishery closed as a result of mortality. Research quota set for 2001.
Bremer Bay purse seine	Yes	Not applicable	Severely depleted	0	Not applicable	2000	100-200	2001	Fishery closed as a result of mortality. Research quota set for 2001.
Esperance purse seine	Yes	Fully exploited	Depleted	1060	983 (453 boat days)	2000	1,000-1,200	2001	Quota set allowing for disease but recognising good recruitment. (Effort cannot be projected.)
<b>NORTHERN INLAND BIOREGION</b>									
Lake Argyle catfish	Yes	Over-exploited	Decreasing	100-140	231	99/2000	100-140	2000/01	Catch well above historic levels due to activation of latent effort.

\* Catch figures supplied for latest year available.

\*\* For key species only.

NA No assessment.

Q Quota management

I Pearl catch quota is in individual oysters.



# Appendices

## APPENDIX 2

### Fisheries Research Division Staff Publications

#### REPORTS

- Baharthah, T. and Sumner, N.R.** 2000. *Community survey 2000*. Fisheries WA, 76 pp.
- Dibden, C.J., Jenkins, G., Sarre, G.A., Lenanton, R.C.J. and Ayzajian, S.G.** 2000. *The evaluation of a recreational fishing stock enhancement trial of black bream (Acanthopagrus butcheri) in the Swan River, Western Australia*. Fisheries Research Report no. 124, Fisheries WA, 26 pp.
- Freeman, K.A.** 2001. *Aquaculture and related biological attributes of abalone species in Australia: A review*. Fisheries Research Report no. 128, Fisheries WA, 52 pp.
- Gaughan, D.J., Baudains, G.A., Mitchell, R.W.D. and Leary, T.I.** 2001. *Pilchard (Sardinops sagax) nursery areas and recruitment process assessment between different regions in southern Western Australia*. Final report to Fisheries Research and Development Corporation on project 1999/150, 36 pp.
- Griffin, D., Wilkin, J.L., Chubb, C.F., Pearce, A., and Caputi, N.** 2001. *Mesoscale oceanographic data analysis and data assimilative modelling with application to Western Australian fisheries*. Final report to Fisheries Research and Development Corporation on project 1997/139. CSIRO Marine Research, Hobart.
- Hine, P.M., Jones, J.B. and Diggles, B.K.** 2000. *A checklist of parasites of New Zealand fishes, including previously unpublished records*. NIWA Technical Report no. 75, 95 pp.
- Lawrence, C.S.** 2000. *Yabby hybrid growout experiment*. Final report to Fisheries Research and Development Corporation on project 97/319.02, 99 pp.
- Lawrence, C.S., Brown J.I. and Bellanger, J.E.** 2000. *Morphology and incidence of yabby (Cherax albidus) burrows in Western Australia*. Final report to Aquaculture Development Fund, 27 pp.
- Lee, C.L. and Nel, S.** 2001. *A national aquaculture development strategy for indigenous communities in Australia*. Agriculture, Fisheries and Forestry Australia, Canberra, 120 pp.
- Lloyd, J., Ovenden, J., Newman, S.J. and Keenan, C.** 2000. *Stock structure of Pristipomoides multidentis resources across Northern Australia*. Final report to Fisheries Research and Development Corporation on project 96/131. Fishery Report no. 49, Northern Territory Department of Primary Industry and Fisheries, 100 pp.
- Malseed, B.E. and Sumner, N.R.** 2001. *A 12-month survey of recreational fishing in the Swan-Canning Estuary Basin of Western Australia during 1998-99*. Fisheries Research Report no. 126, Fisheries WA, 46 pp.
- Murray, A.G., O'Callaghan, M. and Jones, B.** 2000. *The development of a model of the spread of the pilchard fish kill events in southern Australian waters*. Final report to Fisheries Research and Development Corporation on project 99/225, 112 pp.
- Newman, S.J., Evans, D. and Ashworth, R.** 2000. *Assessment of the outer-shelf fishery resources off the Pilbara coast of tropical Western Australia*. Final report to Fisheries Research and Development Corporation on project 97/138, 165 pp.
- Newman, S.J., Steckis, R.A., Edmonds, J.S. and Lloyd, J.** 2000. *Analysis of the stable isotopic composition of the otoliths of goldband snapper, Pristipomoides multidentis, as an aid to the determination of stock structure*. Final report to Fisheries Research and Development Corporation on project 98/154, 31 pp.
- Nowara, G.B. and Newman, S.J.** 2001. *A history of foreign fishing activities and fishery-independent surveys of demersal finfish resources in the Kimberley region of Western Australia*. Fisheries Research Report no. 125, Fisheries WA, 88 pp.
- Potter, I.C., de Lestang, S. and Melville-Smith, R.** 2001. *The collection of biological data required for management of the blue swimmer crab fishery in the central and lower west coasts of Australia*. Final report to Fisheries Research and Development Corporation on project 97/137, 53 pp.
- Sumner, N.R. and Malseed B.E.** 2001. *A 12-month survey of recreational fishing in Shark Bay during 2000-01*. Final report on World Heritage project, 32 pp.
- Sumner, N.R., Malseed, B.E. and Williamson, P.C.** 2000. *Estimating the recreational catch of blue swimmer crabs in the south west of Western Australia*. Final report to Fisheries Research and Development Corporation on project 98/119.
- Williams, I.H., Vercoe, P.E. and Lawrence, C.S.** 2001. *Freshwater aquaculture ponds for collaborative research between industry, university and government*. Final report to Aquaculture Development Fund, 16 pp.

#### SCIENTIFIC PAPERS

- Cappo, M., Eden, P., Newman, S.J. and Robertson, S.** 2000. *A new approach to validation of periodicity and timing of opaque zone formation in the otoliths of eleven species of Lutjanus from the central Great Barrier Reef*. *Fishery Bulletin* (US) 98(3): 474-488.

- Cappo, M., Walters, C.F. and Lenanton, R.C.** 2000. Estimation of rates of migration, exploitation and survival using tag recovery data for western Australian 'salmon' (*Arripis truttaceus*: Arripidae: Percoidae). *Fisheries Research* 44: 207-217.
- Caputi, N., Chubb, C.F., Hall, N.G. and Brown, R.S.** 2000. Measurement of catch and fishing effort in the western rock lobster fishery, in *Spiny Lobsters: Fisheries and Culture*, eds B.F. Phillips and J. Kittaka, Fishing News Books, Oxford, pp. 334-356.
- Cheah, M.S.H. and Lee, C.L.** 2000. Induced ovulation of the Australian eel-tailed catfish *Neosilurus ater* (Perugia) with Ovaprim. *Asian Fisheries Science* 13: 87-96.
- Chubb, C.F.** 2000. Reproductive biology: Issues for management, in *Spiny Lobsters: Fisheries and Culture*, eds B.F. Phillips and J. Kittaka, Fishing News Books, Oxford, pp. 245-275.
- Coote, T.A., Hone, P.W., Van Barneveld, R. and Maguire, G.B.** 2000. Optimal protein level in a semi-purified diet for juvenile greenlip abalone (*Haliotis laevigata*). *Aquaculture Nutrition* 6(4): 213-220.
- Crowe, T.P., Dobson, G. and Lee, C.L.** 2001. A novel method for tagging and recapturing animals in complex habitats and its use in research into stock enhancement of *Trochus niloticus*. *Aquaculture* 194: 383-391.
- Dabrowski, K., Czesny, S., Kolkovski, S., Lynch, W.E. Jr, Bajer, P. and Culver, D.A.** 2000. Intensive culture of walleye larvae produced out of season and during regular season spawning. *North American Journal of Aquaculture* 62: 219-224.
- Evans, L.H., Jones, J.B. and Brock, J.A.** 2000. Diseases of spiny lobsters, in *Spiny Lobsters: Fisheries and Culture*, eds B.F. Phillips and J. Kittaka, Fishing News Books, Oxford, pp. 586-600.
- Gaughan, D.J., Mitchell, R.W. and Blight, S.J.** 2000. Impact of mortality, possibly due to *Herpesvirus* sp., on pilchard, *Sardinops sagax*, stocks along the south coast of Western Australia 1998-1999. *Marine and Freshwater Research* 51: 601-612.
- Gaughan, D.J., White K.V. and Fletcher, W.J.** 2001. Links between functionally distinct adult assemblages of *Sardinops sagax*: Larval advection across management boundaries. *ICES Journal of Marine Science* 58(3): 597-606.
- Gauldie, R.W. and Jones, B.J.** 2000. Stocks or geographically separated populations of the New Zealand orange roughy, *Hoplostethus atlanticus*, in relation to parasite infestation, growth rate, and otolith shape. *Bulletin of Marine Science* 67(3): 949-971.
- Glencross, B.D.** 2000. Essential fatty acid and lipid requirements in farmed fish: Sourcing the good oils. *Proceedings of the Nutrition Society of Australia* 24: 216-224.
- Glencross, B.D. and Smith, D.M.** 2001. A study of the arachidonic acid requirements of the giant tiger prawn, *Penaeus monodon*. *Aquaculture Nutrition* 7(1): 59-70.
- Glencross, B.D. and Smith, D.M.** 2001. Optimising the essential fatty acids, eicosapentaenoic and docosahexaenoic acid in the diet of the prawn, *Penaeus monodon*. *Aquaculture Nutrition* 7(2): 101-112.
- Glencross, B.D., Curnow, J.C., Smith, M.B., Smith, D.M. and Williams, K.C.** 2001. The protein and lipid requirements of post-puerulus western rock lobster (*Panulirus cygnus*). *Aquaculture* 199: 121-131.
- Groom, P.K., Lamont, B.B. and Wright, I.W.** 2001. Lottery (stochastic) and non-lottery (biological) processes explain recruitment patterns among eight congeneric shrub species in southwestern Australia. *Journal of Mediterranean Ecology* 2: 1-14.
- Hyndes, G.A., Platell, M.E., Potter, I.C. and Lenanton, R.C.J.** 1999. Does the composition of the demersal fish assemblages in temperate coastal waters change with depth and undergo consistent seasonal changes? *Marine Biology* 134: 335-352.
- Izquierdo, M.S., Tandler, A., Salhi, M. and Kolkovski, S.** 2001. Influence of dietary polar lipids' quantity and quality on ingestion and assimilation of labelled fatty acids by larval gilthead seabream. *Aquaculture Nutrition* 7: 153-160.
- Jackson, G. and Cheng, Y.W.** 2001. Parameter estimation with egg production surveys to estimate snapper, *Pagrus auratus*, biomass in Shark Bay, Western Australia. *Journal of Agricultural, Biological and Environmental Statistics* 6(2): 243-257.
- Jones, J.B.** 2001. Baitfish and quantitative risk assessment issues. *Proceedings of the OIE International Conference on Risk Analysis in Aquatic Animal Health, Paris, France, 8-10 February 2000*, ed. C.J. Rodgers, Office International des Epizooties (OIE), 360 pp.
- Jones, J.B. and Lawrence, C.S.** 2001. Diseases of yabbies (*Cherax albidus*) in Western Australia. *Aquaculture* 194: 221-232.
- Kolkovski, S.** 2001. Digestive enzymes in fish larvae and juveniles: Implications and applications to formulated diets. *Aquaculture* 200: 181-201.
- Kolkovski, S. and Tandler, A.** 2000. The use of squid protein hydrolysate as a protein source in microdiets for gilthead seabream *Sparus aurata* larvae. *Aquaculture Nutrition* 6: 11-17.
- Kolkovski, S., Czesny, S. and Dabrowski, K.** 2000. Use of krill hydrolysate as feed attractant for fish larvae and juveniles. *Journal of the World Aquaculture Society* 31: 81-88.



# Appendices

- Kolkovski, S., Czesny, S., Yackey, C., Moreau, R., Cihla, F., Mahan, D. and Dabrowski, K.** 2000. The effect of vitamins C and E in (n-3) highly unsaturated fatty acids-enriched *Artemia nauplii* on growth, survival and stress resistance of fresh water walleye *Stizostedion vitreum* larvae. *Aquaculture Nutrition* 6: 199-206.
- Kolkovski, S., Jenkins, G.I. and Lee, C.L.** 2000. Cage culture in Western Australia: Current status and future plans. *Proceedings of the First International Symposium on Cage Aquaculture in Asia, 2-6 November 1999, Tungkan, Taiwan*, eds I. Chiu Liao and C. Kwei Lin, Asian Fisheries Society and World Aquaculture Society, pp. 39-47.
- Kolkovski, S., Yackey, C., Czesny, S. and Dabrowski, K.** 2000. The effect of microdiet supplementation of dietary digestive enzymes and a hormone on growth and enzyme activity in yellow perch juveniles. *North American Journal of Aquaculture* 62: 130-134.
- Koven, W., Kolkovski, S., Hadas, E., Gamsiz, K. and Tandler, A.** 2001. Advances in the development of microdiets for gilthead seabream, *Sparus aurata*: A review. *Aquaculture* 194(1-2): 107-121.
- Lawrence, C.S. and Jones, C.** 2001. *Cherax*, in *Biology of Freshwater Crayfish*, ed. D.M. Holdich, Blackwell Science, Oxford.
- Lawrence, C.S., Morrissy, N.M, Vercoe, P.E. and Williams I.H.** 2000. Hybridisation in freshwater crayfish: Production of all male progeny. *Journal of the World Aquaculture Society* 31: 651-658.
- MacArthur, L.D. and Hyndes, G.A.** 2001. Differential use of seagrass assemblages by a suite of odacid species. *Estuarine, Coastal and Shelf Science* 52(1): 79-90.
- Maguire, G.M. and Lawrence, C.S.** 2001. Marron farming turning the corner. *Land Management* 1(3): 30-31.
- Melville-Smith, R., Phillips, B. and Penn, J.** 2000. Recreational spiny lobster fisheries: Research and management, in *Spiny Lobsters: Fisheries and Culture*, eds B.F. Phillips and J. Kittaka, Fishing News Books, Oxford, pp. 447-461.
- Molony, B.W. and Sheaves, M.** 2001. Challenges of external insemination in a tropical sparid fish, *Acanthopagrus berda*. *Environmental Biology of Fishes* 61: 65-71.
- Murray, A.G., O'Callaghan, M. and Jones, B.** 2001. A model of transmission of a viral epidemic among schools within a shoal of pilchards. *Ecological Modelling* 144: 245-251.
- Murray, A.G., O'Callaghan, M. and Jones, B.** 2001. Simple models of massive epidemics of herpes virus in Australian (and New Zealand) pilchards. *Environment International* 27: 243-248.
- Newman, S.J., Cappo, M. and Williams, D.McB.** 2000. Age, growth and mortality of the stripey, *Lutjanus carponotatus* (Richardson) and the brown-stripe snapper, *L. vitta* (Quoy and Gaimard) from the central Great Barrier Reef, Australia. *Fisheries Research* 48(3): 263-275.
- Newman, S.J., Cappo, M. and Williams, D.McB.** 2000. Age, growth, mortality rates and corresponding yield estimates using otoliths of the tropical red snappers, *Lutjanus erythropterus*, *L. malabaricus* and *L. sebae*, from the central Great Barrier Reef. *Fisheries Research* 48(1): 1-14.
- Newman, S.J., Steckis, R.A., Edmonds, J.S. and Lloyd, J.** 2000. Stock structure of the goldband snapper, *Pristipomoides multidens* (Pisces: Lutjanidae) from the waters of northern and western Australia by stable isotope ratio analysis of sagittal otolith carbonate. *Marine Ecology Progress Series* 198: 239-247.
- Penn, J.W., Caputi, N. and Melville-Smith, R.** 2001. Crustacean fisheries, in *Encyclopedia of Ocean Sciences*, eds J. Steele, S.Thorpe and K. Turekian, Academic Press, London, pp. 570-578.
- Phillips, B.F., Chubb, C.F. and Melville-Smith, R.** 2000. The status of Australia's rock lobster fisheries, in *Spiny Lobsters: Fisheries and Culture*, eds B.F. Phillips and J. Kittaka, Fishing News Books, Oxford, pp. 45-77.
- Phillips, B. F., Cruz, R., Caputi, N. and Brown, R. S.** (2000). Predicting the catch of spiny lobster fisheries, in *Spiny Lobsters: Fisheries and Culture*, eds B.F. Phillips and J. Kittaka, Fishing News Books, Oxford, pp. 357-375.
- Pironet, F.N. and Jones, J.B.** 2000. Treatments for ectoparasites and diseases in captive Western Australian dhufish. *Aquaculture International* 8(4): 349-361.
- Potter, I.C., Chalmer, P.N., Tiivel, D.J., Steckis, R.A., Platell, M.E. and Lenanton, R.C.J.** 2000. The fish and fishery of the Leschenault Estuary in south-western Australia. *Journal of the Royal Society of Western Australia* 83(4): 259-280.
- Purcell, S.W.** 2000. Association of epilithic algae with sediment distribution on a windward reef in the northern Great Barrier Reef, Australia. *Bulletin of Marine Science* 66: 199-214.
- Risbey, D.A., Calver, M.C., Short, J., Bradley, J.S. and Wright, I.W.** 2000. The impact of cats and foxes on the small vertebrate fauna of Heirisson Prong, Western Australia. II. A field experiment. *Wildlife Research* 27: 223-235.
- Sheaves, M.J. and Molony, B.W.** 2000. Short-circuit in the mangrove food chain. *Marine Ecology Progress Series* 199: 97-109.
- Simpfendorfer, C.A., Goodried, A.B. and McAuley, R.B.** 2001. Size, sex and geographic variation in the diet of the tiger shark, *Galeocerdo cuvier*, from Western Australian waters. *Environmental Biology of Fishes* 61: 37-46.

- St John, J.** 2001. Temporal variation in the diet of a coral reef piscivore (Pisces: Serranidae) was not seasonal. *Coral Reefs* 20(2): 163-170.
- St John, J., Russ, G.R., Brown, I.W. and Squire, L.C.** 2001. The diet of a large coral reef serranid, *Plectropomus leopardus*, in two fishing zones on the Great Barrier Reef, Australia. *Fishery Bulletin* 99: 180-192.
- Stephenson, P.C., Edmonds, J.S., Moran, M.J. and Caputi, N.** 2001. Analysis of stable isotope ratios to investigate stock structure of red emperor and Rankin cod in northern Western Australia. *Journal of Fish Biology* 58: 126-144.
- Ward, T.M., Hoedt, F., McLeay, L., Dimmlich, W.F., Jackson, G., Rogers, P.J. and Jones, K.** 2001. Have the recent mass mortalities of the sardine *Sardinops sagax* facilitated an expansion in the distribution and abundance of anchovy, *Engraulis australis* in South Australia? *Marine Ecology Progress Series* 220: 241-251.
- Ward, T.M., Hoedt, F., McLeay, L., Dimmlich, W.F., Kinloch, M., Jackson, G., McGarvey, R., Rogers, P.J. and Jones, K.** 2001. Effects of the 1995 and 1998 mass mortality events on the spawning biomass of sardine, *Sardinops sagax*, in South Australian waters. *ICES Journal of Marine Science* 58(4):865-876.
- IN PRESS**
- Caputi, N., Chubb, C.F. and Pearce, A.** 2001. Environmental effects on recruitment of the western rock lobster, *Panulirus cygnus*. *Marine and Freshwater Research* 52.
- Cheng, Y.W. and Kuk, A.Y.C.** Determination of the unknown at first capture of western rock lobsters (*Panulirus cygnus*) by random effects model. *Biometrics*.
- Cheng, Y.W., Lawrence, C.S., Morrissy, N.M. and Bellanger, J.** The statistical correlations and implied causal relationships between physical, chemical and biological parameters and yabby (*Cherax albidus*) production of Western Australian farm dams. *Freshwater Crayfish* 13.
- Gaughan, D.J., Fletcher, W.J. and White, K.V.** Growth rate of larval *Sardinops sagax* from ecosystems with different levels of productivity. *Marine Biology*.
- Griffin, D., Wilkin, J.L., Chubb, C.F., Pearce, A. and Caputi, N.** 2001. Ocean currents and the larval phase of Australian western rock lobster, *Panulirus cygnus*. *Marine and Freshwater Research* 52.
- Lawrence, C.S., Brown, J.I. and Bellanger, J.** Morphology and incidence of yabby burrows in Western Australian farm dams. *Freshwater Crayfish* 13.
- Lenanton, R.C., Bastow, T., Edmonds, J., Valesini, F., Nowara, G. and Connard, M.N.** The use of stable isotope ratios in whitebait carbonate to identify the source of prey for Western Australian penguins. *Marine Ecology Progress Series*.
- Melville-Smith, R., Anderton, S. and Caputi, N.** 2001. Predicting the recreational western rock lobster (*Panulirus cygnus*) catch in Western Australia. *Marine and Freshwater Research* 52.
- Mitchell, R.W.D., Blight, S.J., Gaughan, D.J. and Wright, I.W.** Does the mortality of released *Sardinops sagax* increase if rolled over the headline of a purse seine net? *Fisheries Research*.
- Molony, B.W., Morrissy, N. and Bird, C.** The West Australian recreational marron fishery (*Cherax tenuimanus*) (Smith 1912): History and future challenges of a recreational fishery. *Freshwater Crayfish* 13.
- Phillips, B.F., Melville-Smith, R., Cheng, Y.W. and Rossbach, M.** 2001. Testing collector designs for commercial harvesting of western rock lobster (*Panulirus cygnus*) puerulus. *Marine and Freshwater Research* 52.
- Stephens, F.J., Cleary, J.J., Jenkins, G., Jones, B., Raidal, S.R. and Thomas, J.B.** 2001. Pathogenesis and epidemiology of spontaneous exophthalmos in the Western Australian dhufish *Glaucosoma hebraicum* Richardson. *Journal of Fish Diseases* 24.
- NON-REFEREED CONFERENCE/WORKSHOP PAPERS**
- Caputi, N., Penn, J., Kangas, M. and Sporer, E.** 2001. Research and management of prawn fisheries in Western Australia. *Aménagement de la pêche crevettière à Madagascar: Actes de l'atelier, 12-14 December 2000, Antananarivo, Madagascar*, eds E. Ranaivoson and Z. Kasprzyk, pp. 388-393.
- Glencross, B.D.** 2001. Putting a value on lupin use in the aquaculture industry: A fishy business? *Crop Updates 2001*, Department of Agriculture, Western Australia. Online: <http://www.agric.wa.gov.au/cropupdates/2001/lupins/Glencross.htm>.
- Kolkovski, S.** 2000. *Artemia*: Past, present and future status, in *Hatchery Feeds: Research and Development Plan 2000-2005*, ed. M.J. Littmann. Prepared for the Fisheries Research and Development Corporation in conjunction with the Hatchery Feeds Workshop, 9-10 March 2000, Cairns. Online: <http://www.aims.gov.au/pages/research/hatchery-feeds/hfa-01.html>.
- Lawrence, C.S.** 2000. Recent developments in yabby research. *Proceedings of the Australian Crayfish Aquaculture Workshop, Perth, 5 August 2000*, eds C.S. Lawrence and G. Whisson, International Association of Astacology, pp. 26-33.
- Lawrence, C.S.** 2001. From the farm dam to market: Trapping, holding and purging yabbies. *Proceedings of the Aqua 2001 Conference, Dubbo, NSW, 16-19 February 2001*, NSW Fisheries, pp. 21-22.
- Lawrence, C.S.** 2001. The WA yabby experience. *Proceedings of the Aqua 2001 Conference, Dubbo, NSW, 16-19 February 2001*, NSW Fisheries, pp. 7-8.



# Appendices

- Lawrence, C.S.** 2001. WA Fisheries research results. *Proceedings of the Aqua 2001 Conference, Dubbo, NSW, 16-19 February 2001*, NSW Fisheries, pp. 31-36.
- Lawrence, C.S.** 2001. The gap between research and industry application: The WA yabby experience. *Proceedings of AQUATECH 2001: National Aquaculture Technical Training Conference, Fremantle, 17-18 January 2001*, pp. 22-23.
- McKinlay, J.P. and Millington, P.J.** 2000. Fisher obligations in co-managed fisheries: The case for enforcement. *Use of Property Rights in Fisheries Management: Proceedings of the FishRights99 Conference, 11-19 November 1999, Fremantle, Western Australia*, ed. R. Shotton. Fisheries Technical Paper 404/2, FAO, Rome, pp. 405-414.
- Melville-Smith, R. and Phillips, B.F.** 2001. Testing collector designs for commercial harvesting of western rock lobster puerulus. *Developments in Rock Lobster Enhancement and Aquaculture III: Proceedings of the Third Annual Rock Lobster Enhancement and Aquaculture Subprogram Workshop, Wellington, New Zealand, 2001*, ed. R. van Barneveld, RLEAS Publication no. 6, p. 53.
- Phillips, B.F. and Melville-Smith, R.** 2001. Potential impacts of puerulus collection on the biological neutrality of the West Australian rock lobster fishery and the relevance to other fisheries. *Developments in Rock Lobster Enhancement and Aquaculture III: Proceedings of the Third Annual Rock Lobster Enhancement and Aquaculture Subprogram Workshop, Wellington, New Zealand, 2001*, ed. R. van Barneveld, RLEAS Publication no. 6, pp. 47-52.
- Rogers, P.P. and Penn, J.W.** 2000. Shark Bay Prawn Fishery: A synoptic history and the importance of 'property rights' in its management. *Use of Property Rights in Fisheries Management: Proceedings of the FishRights99 Conference, 15-19 November 1999, Fremantle, Western Australia*, ed. R. Shotton. Fisheries Technical Paper 404/2, FAO, Rome, pp. 297-303.
- Southgate, P. and Kolkovski, S.** 2000. Development of artificial diets for fish larvae. *Hatchery Feeds: Proceedings of a Workshop held in Cairns, 9-10 March 2000*, ed M.J. Littmann. Report to the Fisheries Research and Development Corporation. Online: <http://www.aims.gov.au/pages/research/hatchery-feeds/hfa-01.html>.
- Southgate, P. and Kolkovski, S.** 2000. Formulated diets: development of formulated diets for fish larvae, in *Hatchery Feeds: Research and Development Plan 2000-2005*, ed. M.J. Littmann. Prepared for the Fisheries Research and Development Corporation in conjunction with the Hatchery Feeds Workshop, 9-10 March 2000, Cairns. Online: <http://www.aims.gov.au/pages/research/hatchery-feeds/hfa-01.html>.
- IN PRESS**
- Jackson, G.** Evaluation of hatchery-based restocking of Shark Bay snapper as a potential management tool – the need for good science and a cautious approach in a World Heritage context. *Proceedings of the Australian Society of Fish Biology 2000 Workshop, 'Stock Enhancement of Marine and Freshwater Fisheries', Albury, NSW, 7-13 August 2000*.
- Lenanton, R.C. and Norris, J.** Sound policy and rules – central to any stock enhancement decision process. *Proceedings of the Australian Society of Fish Biology 2000 Workshop, 'Stock Enhancement of Marine and Freshwater Fisheries', Albury, NSW, 7-13 August 2000*.
- Molony, B.W.** Trout (*Oncorhynchus mykiss*) production and stocking in Western Australia: An examination of the fishery and evaluation of the stocking program. *Proceedings of the Australian Society of Fish Biology 2000 Workshop, 'Stock Enhancement of Marine and Freshwater Fisheries', Albury, NSW, 7-13 August 2000*.
- POPULAR ARTICLES AND CLIENT INFORMATION**
- Commercial Fisheries Production Bulletin: Western Rock Lobster Fishery no. 21, 18 August 2000. Fisheries WA Research Division, 4 pp.
- Commercial Fisheries Production Bulletin: Western Rock Lobster Fishery no. 22, 15 January 2001. Fisheries WA Research Division, 2 pp.
- Commercial Fisheries Production Bulletin: Western Rock Lobster Fishery no. 23, 30 May 2001. Fisheries WA Research Division, 4 pp.
- Lawrence, C.S. and Bellanger J.** 2001. How to grow bigger yabbies and improve farm income. Aquainfo no. 25, Fisheries WA, 7 pp.
- Lee, C. L. (ed.)** 2001. Secretariat of the Pacific Community Trochus Information Bulletin no. 7, 35 pp.
- Lee, C. L.** 2001. Pictorial view of the ACIAR trochus reseeding research project. Secretariat of the Pacific Community Trochus Information Bulletin no. 7, pp. 30-32.
- Purcell S.W. and Lee, C.L.** 2001. Testing the efficacy of restocking trochus using broodstock transplantation and juvenile seeding: an ACIAR funded project. Secretariat of the Pacific Community Trochus Information Bulletin no. 7, pp. 3-8.
- Rossbach, M., Phillips, B.F. and Melville-Smith, R.** 2001. The sandwich collector, developed for commercial-scale harvesting of western rock lobster (*Panulirus cygnus*) pueruli. *The Lobster Newsletter* 14(1): 7-9.

## APPENDIX 3

### Table of Catches from Fishers' Statutory Monthly Production Returns of 1999/2000

This table contains the landed and estimated live weight of species recorded in the compulsory catch and fishing effort returns provided by fishermen each month. These data include the catch taken as by-product as well as the targeted catch. These catch data may differ slightly from some of the catch estimates presented for specific fisheries as the latter may include additional data from other sources, such as research logbooks and processors. The figures may also differ slightly from previously reported figures as additional data may have been received by the agency. The table represents the latest year for which a complete set of data is available.

Catch category	Landed weight (kg)	Live weight (kg)	Catch category	Landed weight (kg)	Live weight (kg)
<b>Fish</b>			<b>Fish (continued)</b>		
Anchovy	9,457	9,457	Javelin fish	25,638	25,638
Barracuda (northern pike)	1,058	1,064	Jewfish, Westralian (dhufish)	195,898	210,879
Barramundi (giant perch)	30,111	47,650	Jobfish	67,505	67,566
Bigeye (not tuna)	22,289	22,289	Jobfish (goldband snapper)	136,353	136,530
Boarfish	4,703	5,281	Jobfish, rosy	171,010	171,031
Bonefish (Pacific bonefish)	194	194	John Dory	91	98
Bonito	1,446	1,482	Kingfish, black (cobia)	25,176	25,620
Bream, Argyle	10	13	Kingfish, yellowtail	1,288	1,428
Bream, black	28,145	28,145	Knifejaw	798	951
Bream, buffalo	180	180	Leather jacket	30,479	48,552
Bream, mixed	107	107	Ling, pink (rock ling)	38	38
Bream, monocle	14,404	14,404	Long tom	85	85
Bream, Robinson's	37,246	37,690	Mackerel, blue	13,855	13,855
Bream, sea	1,219	1,219	Mackerel, grey	4,213	4,800
Bream, silver (tarwhine)	15,744	15,744	Mackerel, other	67,525	72,676
Bream, western yellowfin	10,841	10,841	Mackerel, scaly	2,800,045	2,800,045
Catfish, sea (golden cobbler)	42,142	42,388	Mackerel, shark	318	343
Chinaman fish (not cod)	14,710	15,835	Mackerel, Spanish	262,626	337,347
Cobbler	52,613	73,980	Mangrove jack	10,548	10,665
Cobbler, silver	85,357	230,526	Maray	10,885	10,885
Cod	103,007	106,851	Morwong	288	294
Cod, bar (grey-banded, 8-bar)	6,474	6,586	Mullet, bluetail	20	20
Cod, Chinaman	5,220	5,837	Mullet, diamond scale	99	130
Cod, Maori	20	20	Mullet, other	2,168	2,168
Cod, Rankin	111,451	119,608	Mullet, red	62,091	62,091
Cod, spotted	49,996	50,029	Mullet, sea	386,285	386,285
Dart	185	185	Mullet, yellow-eye	82,774	82,774
Dolphinfish	475	540	Mulloway	48,016	49,721
Emperor, blue-lined (grass, black)	1,305	1,335	Parrot fish	9,310	9,327
Emperor, blue-spot	15,725	15,725	Perch, Moses	54,552	54,601
Emperor, spangled	3,752	4,333	Perch, other	18,736	19,258
Emperor, sweetlip	49,980	52,199	Perch, pearl	36,814	37,008
Flagfish (Spanish flag)	174,166	174,210	Perch, red (maroon sea perch)	14,880	14,979
Flathead, other	10,780	10,785	Perch, scarlet sea (saddletail)	96,574	96,687
Flathead, rock	92	92	Perch, yellowtail	1,260	1,260
Flounder	2,518	2,630	Pike, sea	4,735	4,735
Footballer (footballer sweep, banded sweep)	331	344	Pilchard	1,463,750	1,463,750
Foxfish (hogfish, pigfish)	538	538	Queenfish	828	2,017
Garfish, sea	45,285	45,285	Red emperor	257,877	259,464
Groper	153	204	Redfish	46,920	48,755
Groper, baldchin	43,027	45,991	Redfish, Bight	9,038	9,596
Groper, blue	27,053	33,801	Roach	13	13
Gurnard	279	282	Salmon, Western Australian	2,597,744	2,597,744
Hapuku	13,590	13,855	Samson fish (sea kingfish)	93,838	102,110
Herring, Australian	841,385	841,387	Scad, yellowtail	7,757	7,757
Herring, hairback	21	21	Shark, blacktip	36,537	64,971
Herring, Perth	12,328	12,328	Shark, bronze whaler	220,520	348,232
			Shark, creek whaler	1,710	2,720
			Shark, eastern school	4,342	6,906



# Appendices

Catch category	Landed weight (kg)	Live weight (kg)
<b>Fish (continued)</b>		
Shark, 'golden' (copper whaler)	1,381	2,196
Shark, grey nurse	737	1,135
Shark, gummy	154,622	244,956
Shark, hammerhead	33,867	53,772
Shark, lemon	1,362	2,168
Shark, mako (shortfin)	861	1,222
Shark, other	126,365	199,644
Shark, pencil	1,433	2,285
Shark, pigeye	450	716
Shark, silvertip	240	382
Shark, spot tail	400	636
Shark, spurdog	1,470	2,332
Shark, tawny nurse	211	335
Shark, thickskin (sandbar)	146,488	232,469
Shark, tiger	25,689	33,768
Shark, whiskery	140,909	210,092
Shark, wobbegong	32,287	51,092
Skates and rays, other	13,051	23,874
Snapper, bullnose (variegated emperor)	1,132	1,132
Snapper, golden (fingermark sea perch)	343	394
Snapper, frypan	53,316	53,316
Snapper, Lenko (deep sea)	42	42
Snapper, long nose	27,628	29,175
Snapper, north-west (large)	90,802	91,751
Snapper, north-west (small)	480,581	480,623
Snapper, north-west	150,439	166,825
Snapper, pink	728,590	738,732
Snapper, Queen	45,930	53,856
Snapper, red-spot emperor	44,126	44,126
Snapper, red (swallowtail)	251,586	251,590
Snapper, ruby	104	106
Snapper, Tang's	6	6
Sole	2,145	2,145
Sprat, blue	22,406	22,406
Sweep	1,437	1,653
Sweetlip	100,532	102,793
Tailor	55,800	55,800
Threadfin bream (butterfish)	194,703	194,703
Threadfin salmon	11,450	13,584
Threadfin salmon, giant (king)	137,889	149,656
Trevalla, deepsea	4,714	4,718
Trevally, golden	26,768	26,821
Trevally, other (skippy)	219,257	221,602
Trevally, skipjack	7,998	8,033
Trout, coral	27,738	28,535
Trout, spotted (duskytail groper)	754	754
Tuna, bigeye	3	3
Tuna, mackerel	236	236
Tuna, northern bluefin	1,994	1,994
Tuna, other	26,560	26,786
Tuna, skipjack (striped)	1,135	1,297
Tuna, southern bluefin	6	7
Tuna, yellowfin	3,600	3,896
Turram	226	226
Tuskfish, bluebone	17,468	17,626
Whitebait	243,999	243,999
Whiting, golden-lined	6,565	6,565

Catch category	Landed weight (kg)	Live weight (kg)
<b>Fish (continued)</b>		
Whiting, King George	45,351	45,377
Whiting, other	3,674	3,674
Whiting, western sand	206,245	206,286
Other fish varieties	157,219	168,037
<b>Total fish</b>	<b>15,359,282</b>	<b>16,311,855</b>
<b>Crabs</b>		
Crab, coral	480	480
Crab, king	8,019	8,019
Crab, mud	3,171	3,171
Crab, sand (blue manna)	673,089	673,089
Crab, snow (Australian)	57,930	57,930
Crab, spider	2	2
Crab, spiny	49,127	49,127
Crab, three-spot surf	655	655
<b>Total crabs</b>	<b>792,473</b>	<b>792,473</b>
<b>Prawns</b>		
Prawn, banana	533,776	533,776
Prawn, brown tiger	1,046,266	1,046,266
Prawn, coral	286,972	286,972
Prawn, endeavour	385,255	385,255
Prawn, leader (black tiger)	1,686	1,686
Prawn, western king	2,260,696	2,260,696
Other prawns	21,826	21,826
<b>Total prawns</b>	<b>4,536,477</b>	<b>4,536,477</b>
<b>Rock lobsters</b>		
Bugs	20,020	20,020
Rock lobster, southern	70,039	70,039
Rock lobster, tropical, painted	336	336
Rock lobster, western	14,531,974	14,532,039
<b>Total rock lobsters</b>	<b>14,622,369</b>	<b>14,622,434</b>
<b>Molluscs</b>		
Abalone, brownlip	15,682	39,227
Abalone, greenlip	66,306	182,324
Abalone, Roe's	100,512	110,801
Cockle	3,095	3,095
Cuttlefish	32,155	32,155
Mussel	1,936	1,936
Octopus	82,508	155,096
Oyster, western rock	7	49
Scallop, saucer	717,791	3,454,343
Squid	62,837	62,837
Other molluscs	80	80
<b>Total molluscs</b>	<b>1,082,909</b>	<b>4,041,943</b>
<b>Other classes</b>		
Beche de mer	21,239	62,597
Sea urchin	5	5
<b>Total other classes</b>	<b>21,244</b>	<b>62,602</b>
<b>Grand Total</b>	<b>36,414,754</b>	<b>40,367,784</b>





FISHERIES  
WESTERN AUSTRALIA