

INDEX

Fishery Bulletin Vol. 81, 1-4

<p>AOAC multiresidue procedure for pesticides..... 391-392</p> <p>ABLE, K. W.--see GRIMES et al.; KATZ et al.; TURNER et al.</p> <p>"Abundance, movements, and feeding habits of harbor seals, <u>Phoca vitulina</u>, at Netarts and Tillamook Bays, Oregon," by Robin R. Brown and Bruce R. Mate..... 291</p> <p>ACERRA, ROBIN--see SHAKLEE et al.</p> <p>"Age and growth of dolphin, <u>Coryphaena hippurus</u>, as determined by growth rings in otoliths," by Hazel A. Oxenford and Wayne Hunte..... 906</p> <p>"Age, growth, and mortality of king mackerel, <u>Scomberomorus cavalla</u>, from the southeastern United States," by Allyn G. Johnson, William A. Fable, Jr., Mark L. Williams, and Lyman E. Barger..... 97</p> <p>"Age, growth, and sexual maturity of Greenland halibut, <u>Reinhardtius hippoglossoides</u> (Walbaum), in the Canadian Northwest Atlantic," by W. R. Bowering.... 599</p> <p>"Age, size, growth, and chemical composition of Atlantic menhaden, <u>Brevoortia tyrannus</u>, from Narragansett Bay, Rhode Island," by Ann Gail Durbin, Edward G. Durbin, Thomas J. Smayda, and Pater G. Verity..... 133</p> <p>Age-frequency estimation</p> <ul style="list-style-type: none"> bias resolution..... 93 biases..... 92 bonito, Pacific..... 91 clam, hard..... 772 cod, Atlantic..... 304 commercial fisheries..... 723 croaker, Atlantic..... 405 halibut, Greenland..... 599 herring, gold spot..... 593 mackerel, king..... 99 mortality rates..... 898 nonsalmonids..... 817 salmonids..... 817 shrimp, pink..... 456 snapper, Hawaiian..... 531 spot..... 405 tuna, southern bluefin..... 726 von Bertalanffy growth equation..... 92 <p>Age-size estimation</p> <ul style="list-style-type: none"> anchovy, northern..... 743 clam, hard..... 697 cod, Atlantic..... 304 crab, blue king..... 621 crab, deep-sea red..... 903 crab, rock..... 357 croaker..... 793 halibut, Greenland..... 599 mackerel, king..... 709 menhaden, Atlantic..... 133 nonsalmonids..... 817 ribbonfish..... 161 salmonids..... 817 shrimp..... 792 shrimp, freshwater..... 656 snapper, Hawaiian..... 531 splittail..... 649 spot..... 792 tilafish..... 756 weakfish..... 803 <p><u>Albula vulpes</u>--see Bonefish</p> <p>ALEVIZON, WILLIAM S.--see COLTON and ALEVIZON</p>	<p>ALLEN, LARRY G., and EDWARD E. DEMARTINI, "Temporal and spatial patterns of nearshore distribution and abundance of the pelagic fishes off San Onofre-Oceanside, California"..... 569</p> <p><u>Alcea apidiissima</u>--see Shad, American</p> <p>"Analyses of feeding in two marine copepods from Santa Monica Bay, California," by G. S. Kleppel and E. Manzanilla..... 154</p> <p>"Analyzing the width of daily otolith increments to age the Hawaiian snapper, <u>Pristipomoides filamentosus</u>," by Ralston, Stephen, and Garret T. Miyamoto..... 523</p> <p>Anchovy, northern..... 815</p> <ul style="list-style-type: none"> age determination..... 743 environmental conditions..... 748 fish population dynamics..... 741 juvenile samples..... 742, 746 larval abundance..... 41, 744, 747 otolith preparation..... 743 size, birth-date..... 744, 747 <p><u>Anguilla anguilla</u>--see Eel, Atlantic</p> <p><u>Anguilla rostrata</u>--see Eel, Atlantic</p> <p><u>Anoplopoma fimbria</u>--see Sablefish</p> <p>APPELDOORN, RICHARD S., "Variation in the growth rate of <u>Mya arenaria</u> and its relationship to the environment as analyzed through principal components analysis and the w parameter of the von Bertalanffy equation"..... 75</p> <p>Aroclor--see Finfish</p> <p>"Aspects of reproduction of the blue mussel, <u>Mytilus edulis</u> (Pelecypoda: Mytilidae) in Long Island Sound," by Diane J. Brousseau..... 733</p> <p>Atlantic, South</p> <ul style="list-style-type: none"> bight habitat..... 537 <p>Baffin Bank..... 600</p> <p>Baja California</p> <ul style="list-style-type: none"> whale, gray..... 513, 519 <p>BAKKALA, RICHARD--see GRANT et al.</p> <p>BARGER, LYMAN E.--see JOHNSON et al.</p> <p>BARKER, MORRIS W.--see MATHEWS and BARKER</p> <p>BARTOO, NORMAN W., and KEITH R. PARKER, "Stochastic age-frequency estimation using the von Bertalanffy growth equation"..... 91</p> <p>Bass fishery</p> <ul style="list-style-type: none"> economic evaluation..... 168, 170, 171 St. Lawrence River--eastern Lake Ontario..... 168 <p>Bass, striped..... 420</p> <ul style="list-style-type: none"> gear..... 421, 423 movements..... 421-425 Savannah River, Ga..... 420 <p>Bathylagus..... 24, 36</p> <p>BEACHAM, TERRY D., "Variability in median size and age at sexual maturity of Atlantic cod, <u>Gadus morhua</u>, on the Scotian Shelf in the northwest Atlantic Ocean"..... 303</p>
---	--

Belonidae.....	260	<u>Cancer borealis</u> --see Crab, Jonah	
Benzo(a)pyrene (BaP).....	473	<u>Cancer irroratus</u> --see Crab, rock	
carcinogenic.....	473, 476, 479	<u>Carcharhinus milberti</u> , sandbar shark.....	61, 72
concentration.....	473-474, 478	Catch estimation--see also Tagging	
in sand.....	476, 478	Catch estimation	
in sea water.....	473, 476-478	bass fishery.....	168
in sediments.....	478	commercial fisheries.....	723
mutagenic.....	473	crab, blue king.....	621
solubilizing or dispersing agent.....	476	fish, demersal.....	537
toxic.....	473, 478	fish, reef.....	679
Bering Sea		fishery management.....	723
fecal material.....	515, 520	mackerel, king.....	711
invertebrates, benthic.....	515, 519	salmon, coho.....	412
invertebrates, infaunal.....	517	shrimp, deepwater pandalid.....	434
large bivalves.....	517, 520	shrimp, freshwater.....	658
walrus.....	501	splittail.....	650
whale, gray.....	513	tuna, bluefin.....	107
		tuna, southern bluefin.....	726
"Biochemical genetics of Pacific blue marlin, <u>Makaira nigricans</u> , from Hawaiian waters," by James B. Shaklee, Richard W. Brill, and Robin Acerra.....	85	<u>Caulolatilus microps</u> --see Tilefish, bluefin	
"Biochemical population structure of yellowfin sole, <u>Limanda aspera</u> , of the north Pacific Ocean and Bering Sea," by W. Stewart Grant, Richard Bakkala, Fred M. Utter, David J. Teel, and Tokimasa Kobayashi.....	667	<u>Centropristis</u> --see Fish, reef	
Biomass calculation		"Changes in size of three dolphin (<u>Stenella</u> spp.) populations in the eastern tropical Pacific," by Tim D. Smith.....	1
macrophyte.....	838	Chemical composition	
zooplankton.....	855	finfish.....	389
Bivalve, benthic		menhaden, Atlantic.....	139, 181
<u>Macoma</u> spp.....	504	sole, yellowfin.....	669
<u>Mya truncata</u>	504-505	Chilean subtropical rainfall.....	363
<u>Serripes groenlandicus</u>	504	long-term.....	369
BOLZ, GEORGE R., and R. GREGORY LOUGH, "Growth of larval Atlantic cod, <u>Gadus morhua</u> , and haddock, <u>Melanogrammus aeglefinus</u> , on Georges Bank, spring 1981".....	827	CHRISTMAN, M. C.--see VAN HEUKELEM et al.	
BOND, CARL E., TING T. KAN, and KATHERINE W. MYERS, "Notes on the marine life of the river lamprey, <u>Lampetra ayresi</u> , in Yaquina Bay, Oregon, and the Columbia River estuary".....	165	Clam rake.....	429
Bonefish		Clam, hard	
Bahamian waters.....	148	acetate peels.....	698, 699, 701, 706
movement patterns.....	148	aging methodology.....	766
ultrasonic equipment.....	148	annual shell increments.....	699, 700
Bongo plankton nets.....	405	Chesapeake Bay.....	697
Bonito, Pacific		dark bands.....	699, 706
von Bertalanffy growth equation.....	93	field population.....	768, 774, 776
BOWERING, W. R., "Age, growth, and sexual maturity of Greenland halibut, <u>Reinhardtius hippoglossoides</u> (Walbaum), in the Canadian Northwest Atlantic".....	599	growth rates.....	706
BOWMAN, R. E.--see DURBIN et al.		light bands.....	699, 706
<u>Brevoortia patronus</u> --see Menhaden, gulf		microgrowth increment.....	701
<u>Brevoortia tyrannus</u> --see Menhaden, Atlantic		rakes.....	429
BRILL, RICHARD W.--see SHAKLEE et al.		shell microstructure.....	699
BROUSSEAU, DIANE J., "Aspects of reproduction of the blue mussel, <u>Mytilus edulis</u> (Pelacypoda: Mytilidae) in Long Island Sound".....	733	southeastern United States.....	765
BROWN, ROBIN R., and BRUCE R. MATE, "Abundance, movements, and feeding habits of harbor seals, <u>Phoca vitulina</u> , at Netarts and Tillamook Bays, Oregon".....	291	Clam, soft-shell	
Bull rake--see Clam rake		environmental parameters.....	79
CPUE.....	52	Gallucci and Quinn parameter w	75, 78
<u>Calanus</u> --see Fish, reef		growth rate.....	75, 78
<u>Caligus</u> parasites.....	246	Maryland to Nova Scotia.....	75
CAMPBELL, A., and M. D. EAGLES, "Size at maturity and fecundity of rock crabs, <u>Cancer irroratus</u> , from the Bay of Fundy and southwestern Nova Scotia".....	357	CLARKE, THOMAS A.--see WILLIAMS and CLARKE	
		CLAUSEN, DAVID M., "Food of walleye pollock, <u>Theragra chalcogramma</u> , in an embayment of southeastern Alaska".....	637
		Climatic changes	
		bass, striped.....	420
		<u>Clupea harengus pallasi</u> --see Herring, Pacific	
		COBB, J. STANLEY--see RICHARDS et al.	
		Cod, Atlantic.....	437, 827
		asteriscus.....	830
		Cape Hatteras to western Nova Scotia.....	438
		catch.....	304, 305, 309, 315
		daily food consumption.....	437
		Georges Bank.....	827
		growth increments.....	829
		lapillus.....	830
		larval growth.....	830-833
		mean size and age.....	316

medium length and age at maturity.....	317	Crab, rock	
otoliths.....	828	Bay of Fundy.....	357
Scottian Shelf.....	303	divers.....	357
"Coherence in zooplankton of a large northwest Atlantic ecosystem," by K. Sherman, J. R. Green, J. R. Goulet, and L. Ejsymont.....	855	fecundity.....	361
COLLETTE, BRUCE B.--see CRESSEY et al.		gonads.....	358
COLTON, DOUGLAS E., and WILLIAM S. ALEVIZON, "Movement patterns of bonefish, <u>Albula vulpes</u> , in Bahamian waters".....	148	lobster trap.....	51, 357
"A comparison of aerial, shipboard, and land-based survey methodology for the harbor porpoise, <u>Phocoena phocoena</u> ," by Scott D. Kraus, James R. Gilbert, and John H. Prescott.....	910	maturity.....	359
"A comparison of gray whale, <u>Eschrichtius robustus</u> , feeding in the Bering Sea and Baja California," by John S. Oliver, Peter N. Slatery, Mark A. Silberstein, and Edmund F. O'Connor.....	513	nonovigorous females and males.....	357
Consumption by guano birds.....	369	ovigerous females.....	358
Contamination		southwestern Nova Scotia.....	357
finfish.....	389	trawls.....	357
grunion, California.....	473	CRADDOCK, JAMES E.--see ROBISON and CRADDOCK	
Copepod parasites.....	260	CREEL, MISHELLE--see DIVITA et al.	
Copepods.....	227	CRESSEY, ROGER F., BRUCE B. COLLETTE, and JOSEPH L. RUSSO, "Copepods and scombrid fishes: A study in host-parasite relationships".....	227
"Copepods and scombrid fishes: A study in host-parasite relationships," by Roger F. Cressey, Bruce B. Collette, and Joseph L. Russo.....	227	Croaker, Atlantic.....	789
Copepods, marine		infections.....	895
<u>Acartia tonsa</u>	155	larvae.....	895
<u>Calanus pacificus</u>	155	larval abundance.....	407-410
diatom.....	156	mean standard length.....	407-409, 411
dinoflagellates.....	156	1972-73 season.....	408
food selection.....	154	1973-74 season.....	409
Santa Monica Bay, Calif.....	154	occurrence of.....	405
<u>Coryphaena hippurus</u> --see Dolphin		Cunner	
Crab, blue king.....	621	foraging behavior.....	426
Alaska.....	621	intertidal feeding.....	426-428
female size.....	621	Scituate, Mass.....	426
male size.....	622	<u>Cymatogaster aggregata</u> --see Perch, shiner	
materials and methods of collection.....	621	<u>Cynoscion regalis</u> --see Weakfish	
Crab, deep-sea red		DANIELS, ROBERT A., and PETER B. MOYLE, "Life history of splittail (Cyprinidae: <u>Pogonichthys macrolepidotus</u>) in the Sacramento-San Joaquin estuary".....	647
growth.....	903-905	DeMARTINI, EDWARD E.--see ALLEN and DeMARTINI	
juveniles.....	903	"Delineation of tilefish, <u>Lopholatilus chamaeleonticeps</u> , stocks along the United States east coast and in the Gulf of Mexico," by S. J. Katz, C. B. Grimes, and K. W. Able.....	41
laboratory-reared.....	903	<u>Delphinus</u>	
western Atlantic Ocean.....	903	<u>D. delphis</u> , common dolphin.....	7
Crab, Jonah		"Development and distribution of the young of northern smoothtongue, <u>Leuroglossus schmidti</u> (Bathylagidae), in the northeast Pacific, with comments on the systematics of the genus <u>Leuroglossus</u> Gilbert," by Jean R. Dunn....	23
lobster trap.....	51	"Distribution of fishes in seagrass meadows: Role of macrophyte biomass and species composition," by Allan W. Stoner.....	837
Crab, mud		"Distribution, size relationships, and food habits of juvenile king-of-the-salmon, <u>Trachipterus altivelis</u> , caught off the Oregon coast," by Jonathan M. Shenker...	161
Alabama.....	885	DIVITA, REGINA, MISHELLE CREEL, and PETER F. SHERIDAN, "Foods of coastal fishes during brown shrimp, <u>Penaeus aztecus</u> , migration from Texas estuaries (June-July 1981)".....	396
American oyster, <u>Crassostrea virginica</u>	863	DODRILL, JON W.--see GILMORE et al.	
characteristics.....	877	Dolphin	
coloration.....	884, 888, 889	Barbados.....	906
differences from other <u>Panopeus</u> species.....	877	eastern tropical Pacific.....	1
ecology.....	887	growth.....	908
electrophoresis of hemocyanins.....	883	kill rates.....	5
genetic variability.....	884	population.....	1
habitat.....	884, 885	purse seine fishery.....	1
morphological characters.....	886	recruitment rates.....	8
North Carolina.....	883	sagittal otoliths.....	906, 907
<u>Panopeus austrobasus</u> new species.....	865	Dolphin mortality	
<u>Panopeus herbstii</u> B. Milne Edwards, s.s.....	866	estimating.....	1
<u>Panopeus lacustris</u> Desbonne.....	868	Dolphin, Fraser's	
<u>Panopeus meridionalis</u> new species.....	872	eastern tropical Pacific.....	283
<u>Panopeus obsesus</u> Smith, new rank.....	873	mesopelagic fishes.....	283, 284-288
<u>Panopeus simpsoni</u> Rathbun, new rank.....	875		
physical and biological factors.....	886		
predators.....	863		
prey.....	884		
species accounts.....	865		
statistical analyses.....	886		

otoliths.....	284, 286-289	"Effects of behavioral interactions on the catchability of American lobster, <u>Homarus americanus</u> , and two species of <u>Cancer</u> crabs," by R. Anne Richards, J. Stanley Cobb, and Michael J. Fogarty.....	51
purse seine.....	283		
shrimp.....	284, 287		
squid.....	284, 287		
stomach contents.....	284, 287		
Dolphin, spinner.....	1	"Effects of benzo(a)pyrene on the early development of California grunion, <u>Leurosthes tenuis</u> (Pisces, Atherinidae)," by Delaine L. Winkler, Keith L. Duncan, Jo Ellen Hose, and Harold W. Puffer.....	473
eastern.....	3		
eastern tropical Pacific.....	1		
whitebelly.....	3		
Dolphin, spotted.....	1	EJSYMONT, L.--see SHERMAN et al.	
coastal.....	2		
eastern tropical Pacific.....	1	El Niño.....	363
offshore.....	2		
DUDLEY, RICHARD G., and T. GLENN MCGAHEE, "Winter and altered spring movements of striped bass in the Savannah River, Georgia".....	420	Electrophoresis	
Dudong.....	501	crab, mud.....	883
DUNCAN, KEITH L.--see WINKLER et al.		marlin, Pacific blue.....	86
DUNCAN, P. B.--see PETERSON et al.		sole, yellowfin.....	667
Duncan's test.....	272-275	tilefish.....	42, 43
DUNN, JEAN R., "Development and distribution of the young of northern smoothtongue, <u>Leuroglossus schmidti</u> (Bathylagidae), in the northeast Pacific, with comments on the systematics of the genus <u>Leuroglossus</u> Gilbert".....	23	"Electrophoretic analyses of hemocyanins from four species of mud crabs, genus <u>Panopeus</u> , with observations on the ecology of <u>P. obesus</u> ," by Bolling Sullivan, Katie Miller, Kathleen Singleton, Anthony G. Scheer, and Austin B. Williams.....	883
DURBIN, A. G.--see DURBIN and DURBIN; DURBIN et al.		Elliott and Persson model.....	437
DURBIN, ANN GAIL, EDWARD G. DURBIN, THOMAS J. SMAYDA, and PETER G. VERITY, "Age, size, growth, and chemical composition of Atlantic menhaden, <u>Brevoortia tyrannus</u> , from Narragansett Bay, Rhode Island".....	133	Embryos	
DURBIN, E. G., A. G. DURBIN, R. W. LANGTON, and R. E. BOWMAN, "Stomach contents of silver hake, <u>Merluccius bilinearis</u> , and Atlantic cod, <u>Gadus morhua</u> , and estimation of their daily rations".....	437	grunion, California.....	475
DURBIN, EDWARD G., and ANN G. DURBIN, "Energy and nitrogen budgets for the Atlantic menhaden, <u>Brevoortia tyrannus</u> (Pisces: Clupeidae), a filter-feeding planktivore".....	177	pollock, walleye.....	890
DURBIN, EDWARD G.--see DURBIN et al.		sculpin, longhorn.....	782
DURKIN, JOSEPH T.--see McCABE et al.		shark, sandtiger.....	210
<u>E. drummondhayi</u> --see Fish, reef		EMMETT, ROBERT L.--see McCABE et al.	
EAGLES, M. D.--see CAMPBELL and EAGLES		"Empirical use of longevity data to estimate mortality rates," by John M. Hoenig.....	898
"Early development of the longhorn sculpin, <u>Myoxocephalus octodecempinosus</u> ," by William A. Walsh and William A. Lund, Jr.....	781	"Energy and nitrogen budgets for the Atlantic menhaden, <u>Brevoortia tyrannus</u> (Pisces: Clupeidae), a filter-feeding planktivore," by Edward G. Durbin and Ann G. Durbin....	177
"An economic evaluation of the St. Lawrence River-eastern Lake Ontario bass fishery," by Fredric C. Menz and Donald P. Wilton.....	168	Energy budgets--see Fish bioenergetics	
Economic studies		<u>Engraulis mordax</u> --see Anchovy, northern	
bass fishery.....	168	EPIFANIO, C. E.--see VAN HEUKELM et al.	
Ecosystems		<u>Epinephelus niveatus</u> --see Fish, reef	
crab, mud.....	885	<u>Eschrichtius robustus</u> --see Whale, gray	
zooplankton.....	857	"The estimation of a catch level which stabilizes the parental biomass of an exploited fish stock," by J. Majowski and J. Hampton.....	723
Eel, American--see Eel, Atlantic		FAO	
Eel, Atlantic		Norway Regional Acoustic Centre.....	363
distribution of leptocephali.....	490	FV Typhoon.....	434
drift migration.....	483	FABLE, WILLIAM A., Jr.--see JOHNSON et al.	
drift simulation.....	483, 496, 498	"Factors affecting the distribution, abundance, and survival of <u>Pandalus jordani</u> (Decapoda, Pandalidae) larvae off the Oregon coast," by Peter C. Rothlisberg and Charles B. Miller.....	455
leptocephali (larvae).....	483	PEGLEY, STEPHEN R.--see PETERSON et al.	
north Atlantic Ocean.....	483, 485	Finfish.....	389
Eel, European--see Eel, Atlantic		U.S. coastal waters.....	391
"Effect of temperature on rate of embryonic development of walleye pollock, <u>Theragra chalcogramma</u> ," by Evan B. Haynes and Steve E. Ignell.....	890	"Fish and shrimp migrations in the northern Gulf of Mexico analyzed using stable C, N, and S isotopa ratios," by Brian Fry.....	789
		Fish bioenergetics	
		menhaden, Atlantic.....	177
		Fish interaction.....	541
		bird predators.....	427
		copepods.....	227
		dolphin, Fraser's.....	283
		fish, pelagic.....	576
		fish, seagrass.....	837
		open shelf.....	541

pollock, walleye.....	639	northeastern United States.....	15
reef.....	541	oocytes.....	342
salmonids and nonsalmonids.....	815	oogenesis.....	344
seals.....	121	oogonia.....	351
shrimp, brown.....	396	ovaries.....	344
South Atlantic Bight.....	537	stomach contents.....	16
species estimates.....	375	Student-Newman-Kuels.....	342
splittail.....	647	student's t-test.....	343
sponge-coral habitat.....	541	types I and II of regressing oocytes.....	352
whiting, Pacific.....	632		
		FOGARTY, MICHAEL J.--see RICHARDS et al.	
Fish, deepwater		"Food habits of Pacific whiting, <u>Merluccius productus</u> , off the west coast of North America, 1967 and 1980," by Patricia A. Livingston.....	629
tagging.....	663		
Fish, larval		"Food habits of yellowtail flounder, <u>Limanda ferruginea</u> (Storer), from off the northeastern United States," by Richard W. Langton.....	15
croaker, Atlantic.....	896		
menhaden, gulf.....	895		
Fish, pelagic		Food habits	
data analysis.....	570	coastal fishes.....	396
feeding behavior.....	585	cod, Atlantic.....	440
foregut content.....	572, 584	copepods, marine.....	154
lampara net.....	570	croaker.....	795
location comparison.....	572	cunner.....	426
net-hauls.....	570	dolphin, Fraser's.....	283
patterns.....	573	fish, pelagic.....	581
San Onofre-Oceanside, Calif.....	570-582	fish, Texas coastal.....	643
species composition.....	572, 576	flounder, yellowtail.....	15
Fish, reef		hake, silver.....	440
black sea bass.....	681	herring, gold spot.....	590
groupers.....	679	lamprey, river.....	165
growth parameters.....	681	nonsalmonids.....	815
grunt.....	681	pollock, walleye.....	637
management problems, potential.....	680	ribbonfish.....	161
mortality parameters.....	681, 683-686, 689, 694	seal, harbor.....	291
porgies.....	679	shrimp.....	795
snappers.....	679	splittail.....	651
South Atlantic Bight.....	679	spot.....	795
yield per recruit.....	680, 681, 683-686, 689	walrus.....	501
Fish, seagrass		whale, gray.....	513
distribution.....	837	whiting, Pacific.....	629
macrophyte biomass.....	837		
manatee grass, <u>Syringodium filiforme</u>	837	"Food of walleye pollock, <u>Theragra chalcogramma</u> , in an embayment of southeastern Alaska," by David M. Clausen.....	637
pinfish.....	838		
seagrass meadows.....	837	"Foods of coastal fishes during brown shrimp, <u>Peneus</u> <u>aztecus</u> , migration from Texas estuaries (June-July 1981)," by Regina Divita, Michelle Creel, and Peter F. Sheridan.....	396
shoal grass, <u>Halodule wrightii</u>	838		
species composition.....	837	FRITZ, LOWELL W., and DEXTER S. HAVEN, "Hard clam, <u>Mercenaria mercenaria</u> : Shell growth patterns in Chesapeake Bay".....	697
turtle grass, <u>Thalassia testudinum</u>	837		
Fish, Texas coastal.....	643	FRY, BRIAN, "Fish and shrimp migrations in the northern Gulf of Mexico analyzed using stable C, N, and S isotope ratios".....	789
croaker.....	643		
cutlassfish.....	643	GADBOIS, DONALD F., and RICHARD S. MANEY, "Survey of polychlorinated biphenyls in selected finfish species from United States coastal waters".....	389
food habits.....	643		
porgy.....	643	<u>Gadus morhua</u> --see Cod, Atlantic	
seatrout.....	643	Gallucci and Quinn parameter	75, 78
stomach contents.....	643	GASKINS, D. E.--see SMITH et al.	
Fish, trawl caught.....	537	<u>Casterosteus aculeatus</u> --see Stickleback, threespine	
biomass.....	540	Gastric evacuation rate	
day-night trawl tows.....	538	estimation method.....	451
relative abundance.....	541	Gear	
South Atlantic Bight.....	537	cod end liners.....	550
species composition.....	541	high-rise roller trawl nets.....	550
sponge-coral habitat.....	537, 543	hook end line.....	547
Fishes, scombrid.....	227	otter trawl.....	543, 550
Fishmeal industry.....	367, 369	trawl.....	550
Flounder, starry.....	815	Yankae otter trawl net.....	538, 547, 550
Flounder, winter		Genetic studies	
eggs.....	914	marlin, Pacific blue.....	85
larvae.....	914	sole, yellowfin.....	667
Narragansett Bay.....	914		
nuclear generator effects.....	915		
Flounder, yellowtail.....	15		
development.....	344, 351, 353		
feeding patterns.....	16, 18, 20		
gonosomatic index.....	343		
Gulf of St. Lawrence to the Chesapeake Bay.....	341		
Harris' hematoxylin.....	342		
macroscopic structure.....	343		
maturity stages.....	343		
microscopic appearance.....	347		

"Geographic and historic variations in growth of weakfish, <i>Cynoscion regalis</i> , in the Middle Atlantic Bight," by Gary Shepherd and Churchill B. Grimes.....	803	HAVEN, DEXTER S.--see FRITZ and HAVEN	
<i>Geryon quinquedens</i> --see Crab, deep-sea red		Hawaiian anchovy or nehu, <i>Stolephorus purpureus</i>	587
GILBERT, JAMES R.--see KRAUS et al.		HAYNES, EVAN B., and STEVE E. IGHELL, "Effect of temperature on rate of embryonic development of walleye pollock, <i>Theragra chalcogramma</i> ".....	890
GILMORE, R. GRANT, JON W. DODRILL, and PATRICIA A. LINLEY, "Reproduction and embryonic development of the sand tiger shark, <i>Odontaspis taurus</i> (Rafinesque)".....	201	Helminth infections cestode, <i>Scolex pleuronectis</i>	895
GOULET, J. R.--see SHERMAN et al.		trematode, <i>Aphanurus</i> sp.....	895
GOVONI, JOHN J., "Helminth parasitism of three larval fishes in the northern Gulf of Mexico".....	895	"Helminth parasitism of three larval fishes in the northern Gulf of Mexico," by John J. Govoni.....	895
GRANT, W. STEWART, RICHARD BAKKALA, FRED M. UTTER, DAVID J. TEEL, and TOKIMASA KOBAYASHI, "Biochemical population structure of yellowfin sole, <i>Limanda aspera</i> of the north Pacific Ocean and Bering Sea".....	667	<i>Herklotsichthys quadrimaculatus</i> --see Herring, gold spot	
GREEN, J. R.--see SHERMAN et al.		Herring.....	124
GRIMES, C. B., S. C. TURNER, and K. W. ABLE, "A technique for tagging deepwater fish".....	663	Herring, gold spot age and growth.....	593, 595
GRIMES, C. B.--see KATZ et al.; TURNER et al.		biology.....	590
GRIMES, CHURCHILL B.--see HUNTSMAN et al.; SHEPHERD and GRIMES		food habits.....	590
"Growth of <i>Geryon quinquedens</i> (Brachyura: Geryonidae) juveniles in the laboratory," by W. Van Heukelele, M. C. Christman, C. E. Epifanio, and S. D. Sulkin.....	903	Hawaii.....	587-588
"Growth of larval Atlantic cod, <i>Gadus morhua</i> , and haddock, <i>Melanogrammus aeglefinus</i> , on Georges Bank, spring 1981," by George R. Bolz and R. Gregory Lough...	827	history.....	589
Growth rates clam, soft-shell.....	75	otoliths.....	588, 593
cod, Atlantic.....	833	reproduction.....	591, 595
crab, deep-sea red.....	903	sagittae.....	588
dolphin.....	906	Herring, Pacific.....	815
haddock.....	833	Herring weir entrapment.....	660
herring, gold spot.....	593	<i>Heterocarpus ensifer</i>	435
menhaden, Atlantic.....	139, 193	<i>Heterocarpus laevisgatus</i>	435
sculpin, longhorn.....	781	" <i>Heterocarpus longirostris</i> MacGilchrist from the Northern Mariana Islands," by Robert B. Moffitt.....	434
tilefish.....	760	<i>Heterocarpus longirostris</i> --see Shrimp, deepwater pandalid	
weakfish.....	803	Historical trends dolphin.....	617
"Growth, mortality, and age/size structure of the fisheries for tilefish, <i>Lopholatilus chamaeleonticeps</i> , in the Middle Atlantic-southern New England region," by S. C. Turner, C. B. Grimes, and K. W. Able.....	751	El Niño.....	363
Grunion, California hatching.....	473, 475-476, 478-479	herring, gold spot.....	589
HAAR, ROBERT T.--see SWARTZMAN and HAAR		subtropical rainfall.....	363
Haddock.....	827	weakfish growth.....	809
asteriscus.....	830	HOENIG, JOHN M., "Empirical use of longevity data to estimate mortality rates".....	898
Georges Bank.....	827	<i>Homarus americanus</i> --see Lobster, American	
growth increments.....	829	"Homing and fisheries contribution of marked coho salmon, <i>Oncorhynchus kisutch</i> , released at two Columbia River locations," by Robert R. Vreeland and Roy J. Wahle.....	143
lapillus.....	830	Homing habits--see Migration	
larval growth.....	830-833	HOSE, JO ELLEN--see WINKLER et al.	
otoliths.....	828	Host-parasite relationship host size, scombrids.....	227
<i>Haemulon plumieri</i> --see Fish, reef		HOWELL, W. HUNTING, "Seasonal changes in the ovaries of adult yellowtail flounder, <i>Limanda ferruginea</i> ".....	341
Hake, silver.....	437	HUNTE, WAYNE, and ROBIN MAHON, "Life history and exploitation of <i>Macrobanchium faustinum</i> in a tropical high-gradient river".....	654
Halibut, Greenland.....	599	HUNTE, WAYNE--see OXFORD and HUNTE	
age and growth.....	600	HUNTSMAN, GENE R., CHARLES S. MANOOCH III, and CHURCHILL B. GRIMES, "Yield per recruit models of some reef fishes of the U.S. South Atlantic Bight".....	679
Canadian northwest Atlantic.....	600	<i>Hypomesus pretiosus</i> --see Smelt, surf	
sexual maturity.....	601, 605, 609	<i>Hypomesus transpacificus</i> --see Splittail	
HAMPTON, J.--see MAJOWSKI and HAMPTON		IGNELL, STEVE E.--see HAYNES et al.	
HANAN, DOYLE A., "Review and analysis of the bluefin tuna, <i>Thunnus thynnus</i> , fishery in the eastern North Pacific Ocean".....	107	"Incidental catch of harbor porpoise, <i>Phocoena phocoena</i> (L.), in herring wains in Charlottes County, New Brunswick, Canada," by G. J. D. Smith, A. J. Read, and D. E. Gaskins.....	660
"Hard clam, <i>Mercenaria mercenaria</i> : Shell growth patterns in Chesapeake Bay," by Lowell W. Fritz and Dexter S. Haven.....	697		

"Interactions between fur seal populations and fisheries in the Bering Sea," by Gordon L. Swartzman and Robert T. Haas.....	121	shad, American.....	324
"Interrelationships between juvenile salmonids and nonsalmonid fish in the Columbia River Estuary," by George T. McCabe, Jr., William D. Muir, Robert L. Emmett, and Joseph T. Durkin.....	815	shrimp, pink.....	455
"Intertidal feeding and refuging by cunners, <u>Tautoglabrus adspersus</u> (Labridae)," by F. G. Whoriskey, Jr.....	426	spot.....	405, 895
Invertebrates, benthic.....	515, 519	LEEK, STEVE L.--see McCABE et al.	
ITZKOWITZ, NORMAN, and J. R. SCHUBEL, "Tolerance of five-day-old winter flounder, <u>Pseudopleuronectes americanus</u> , larvae to thermal shock".....	913	<u>Leiostomus xanthurus</u> --see Spot	
Jamaica freshwater shrimp.....	654	LEITHISER, RONALD--see MacCALL et al.	
Jersey rake--see Clam rake		Leptocephali--see Eel, Atlantic	
JESSEE, BILL--see MacCALL et al.		<u>Leptocottus armatus</u> --see Sculpin, Pacific staghorn	
JOHNSON, ALLYN G., WILLIAM A. FABLE, Jr., MARK L. WILLIAMS, and LYMAN E. BARGER, "Age, growth, and mortality of king mackerel, <u>Scomberomorus cavalla</u> , from the southeastern United States".....	97	<u>Leuresthes tenuis</u> --see Grunion, California	
JOHNSON, JAMES R., and JOSEPH G. LOESCH, "Morphology and development of hatchery-cultured American shad, <u>Alosa sapidissima</u> (Wilson)".....	323	<u>Leuroglossus</u> Gilbert.....	24, 36
JUDY, MAYO H.--see LEWIS and JUDY		<u>Leuroglossus schmidti</u> --see Smoothtongue, northern	
KAN, TING T.--see BOND et al.		LEWIS, ROBERT M., and MAYO H. JUDY, "The occurrence of spot, <u>Leiostomus xanthurus</u> , and Atlantic croaker, <u>Microponias undulatus</u> , larvae in Onslow Bay and Newport River estuary, North Carolina".....	405
<u>Katsuwonus pelamis</u>	435	"Life history and exploitation of <u>Macrobrachium faustinum</u> in a tropical high-gradient river," by Wayne Hunte and Robin Mahon.....	654
KATZ, S. J., C. B. GRIMES, and K. W. ABLE, "Delineation of tilefish, <u>Lopholatilus chamaeleonticeps</u> , stocks along the United States east coast and in the Gulf of Mexico".....	41	"Life history of splittail (Cyprinidae: <u>Pogonichthys macrolepidorus</u>) in the Sacramento-San Joaquin estuary," by Robert A. Daniels and Peter B. Moyle.....	647
King-of-the-salmon--see Ribbonfish		<u>Limanda aspera</u> --see Sole, yellowfin	
KLEPPEL, G. S., and E. MANZANILLA, "Analyses of feeding in two marine copepods from Santa Monica Bay, California".....	154	<u>Limanda ferruginea</u> --see Flounder, yellowtail	
KOBAYASHI, TOKIMASA--see GRANT et al.		LINLEY, PATRICIA A.--see GILMORE et al.	
KRAUS, SCOTT D., JAMES R. GILBERT, and JOHN H. PRESCOTT, "A comparison of aerial, shipboard, and land-based survey methodology for the harbor porpoise, <u>Phocoena phocoena</u> ".....	910	LIVINGSTON, PATRICIA A., "Food habits of Pacific whiting, <u>Merluccius productus</u> , off the west coast of North America, 1967 and 1980".....	629
<u>Legenodelphis hosei</u> --see Dolphin, Fraser's		Lobster traps	
<u>Lagodon rhomboides</u> --see Fish, seagrass		crab, Jonah.....	52
<u>Lampetra ayresii</u> --see Lamprey, river		crab, rock.....	52
Lamprey, river		lobster, American.....	52
Columbia River estuary.....	165	Lobster, American	
growth and upstream migration.....	166	CPUE.....	52
marine life.....	165	lobster traps.....	52-54, 56-57
Yaquina Bay, Oreg.....	165	LOESCH, JOSEPH G.--see JOHNSON and LOESCH	
LANGTON, R. W.--see DURBIN et al.		LONG, CLIFFORD W.--see McCABE et al.	
LANGTON, RICHARD W., "Food habits of yellowtail flounder, <u>Limanda ferruginea</u> (Storer), from off the northeastern United States".....	15	"Long-term variations in the Southern Oscillation, El Niño, and Chilean subtropical rainfall," by William H. Quinn and Victor T. Neal.....	363
Larvae		<u>Lopholatilus chamaeleonticeps</u> --see Tilefish	
anchovy, northern.....	741	LOUGH, R. GREGORY--see BOLZ and LOUGH	
cod, Atlantic.....	834	LOWRY, LLOYD F.--see OLIVER et al.	
croaker.....	895	LUND, WILLIAM A., Jr.--see WALSH and LUND	
croaker, Atlantic.....	405	<u>Lutjanus campechanus</u> --see Fish, reef	
eel, Atlantic.....	483	MacCALL, ALEC D., KEITH R. PARKER, RONALD LEITHISER, and BILL JESSEE, "Power plant impact assessment: A simple fishery production model approach".....	613
flounder, winter.....	913	MacINTOSH, RICHARD A.--see SOMERTON and MacINTOSH	
haddock.....	834	Mackerel, king	
mahadan.....	895	gear types.....	713
pigfish.....	847	immature group.....	719
pollock, walleye.....	890	Louisiana group.....	720
sculpin, longhorn.....	785	otoliths.....	99, 103, 104
		seasonal difference in size.....	712
		sex ratio.....	712, 721
		size at recruitment.....	718
		size comparison.....	716
		size limits.....	718
		southeastern United States.....	97, 709
		spawning group.....	720

<u>Macrobrachium faustinum</u> --see Shrimp, freshwater	
MAHON, ROBIN--see HUNTE and MAHON	
MAJOWSKI, J., and J. HAMPTON, "The estimation of a catch level which stabilizes the parental biomass of an exploited fish stock".....	723
Manatee.....	501
MANEY, RICHARD S.--see GADBOIS and MANEY	
MANOOCH, CHARLES H., III--see TRENT et al.; HUNTSMAN et al.	
MANZANILLA, E.--see KLEPPEL and MANZANILLA	
Marine mammal interaction.....	510
"A mark-recapture test of annual periodicity of internal growth band deposition in shells of hard clams, <u>Mercenaria mercenaria</u> , from a population along the southeastern United States," by C. H. Peterson, P. B. Duncan, H. C. Summerson, and G. W. Safrin, Jr....	765
Marlin, Pacific blue.....	85
electrophoresis.....	86
Hawaiian waters.....	85
Marquesan sardine, <u>Sardinella marquesensis</u>	587, 595-596
MATE, BRUCE R.--see BROWN and MATE	
Mathematical techniques--see also Simulation	
Mathematical techniques	
age-growth estimation.....	805
mortality rates.....	898
otolith growth.....	529
percent similarity index.....	375
power plant impact assessment.....	615
regression analysis.....	530
MATHEWS, STEPHEN B., and MORRIS W. BARKER, "Movements of rockfish (<u>Sebastes</u>) tagged in northern Puget Sound, Washington".....	916
MCCABE, GEORGE T., Jr., CLIFFORD W. LONG, and STEVE L. LEEK, "Survival and homing of juvenile coho salmon, <u>Oncorhynchus kisutch</u> , transported by barge".....	412
MCCABE, GEORGE T., Jr., WILLIAM D. MUIR, ROBERT L. EMMETT, and JOSEPH T. DURKIN, "Interrelationships between juvenile salmonids and nonsalmonid fish in the Columbia River Estuary".....	815
MCCLEAVE, JAMES D.--see POWER and McCLEAVE	
MCGAHEE, T. GLENN--see DUDLEY and MCGAHEE	
<u>Melanogrammus aeglefinus</u> --see Haddock	
Menhaden, Atlantic.....	177
age.....	134, 135
application of models to the field.....	197
chemical composition.....	139
<u>Ditylum</u>	183, 186, 192
<u>Ditylum brightwelli</u>	179, 181-183, 196
energy budget.....	177, 179, 184-186, 191
extension of model to particles of different size....	196
Florida to Maine.....	177
growth rate.....	135
<u>Holocentrus</u>	193
Narragansett Bay, Rhode Island.....	133
nitrogen budget.....	177, 183, 187-191
optimal foraging by planktivores.....	195
size.....	134, 135
Menhaden, gulf	
infections.....	895
larvae.....	895
MENZ, FREDRIC C., and DONALD P. WILTON, "An economic evaluation of the St. Lawrence River--eastern Lake Ontario bass fishery".....	168
<u>Mercenaria mercenaria</u> --see Clam, hard	
<u>Merluccius bilinearis</u> --see Hake, silver	
<u>Merluccius productus</u> --see Whiting, Pacific	
MERRINER, JOHN V.--see ROSS and MERRINER	
"Mesopelagic fishes eaten by Fraser's dolphin, <u>Lagenodelphis hosei</u> ," by Bruce R. Robison and James E. Craddock.....	283
METHOT, RICHARD D., Jr., "Seasonal variation in survival of larval northern anchovy, <u>Engraulis mordax</u> , estimated from the age of distribution of juveniles"....	741
<u>Microgogonias undulatus</u> --see Croaker, Atlantic	
Migration--see also Movement patterns	
Migration.....	789
fish.....	789
laurey, river.....	165
northern Gulf of Mexico.....	789
rockfish.....	920, 921
sablefish.....	415
salmon, coho.....	143, 412
salmonids.....	815
shrimp.....	789
shrimp, brown.....	396
<u>Mikaira nigricans</u> --see Marlin, Pacific blue	
MILLER, CHARLES B.--see ROTHLISBERG and MILLER	
MILLER, KATIE--see SULLIVAN et al.	
MIYAMOTO, GARRET T.--see RALSTON and MIYAMOTO	
MIZROCH, SALLY A.--see WESPSTAD et al.	
MOFFITT, ROBERT B., " <u>Heterocarpus longirostris</u> MacGilchrist from the Northern Mariana Islands".....	434
<u>Morone saxatilis</u> --see Bass, striped	
"Morphology and development of hatchery-cultured American shad, <u>Alosa sapidissima</u> (Wilson)," by James R. Johnson and Joseph G. Loesch.....	323
Morphology	
crab, mud.....	865, 883, 885
pigfish larvae.....	852
shad, American.....	323
Mortality rates	
anchovy, northern.....	741
croaker.....	895
dolphin.....	1
fish, seagrass.....	837
flounder, winter.....	914
grunion, California.....	476
linear regression.....	899, 901
longevity data.....	898
mackerel, king.....	104
menhaden.....	895
porpoise, harbor.....	661
power plant impact.....	613
salmonids.....	820
shrimp, freshwater.....	656
shrimp, pink.....	465
spot.....	895
tilefish.....	760
"Movement of sablefish, <u>Anoplopoma fimbria</u> , in the northeastern Pacific Ocean as determined by tagging experiments (1971-80)," by Vidar G. Wespestad, Kenneth Thorsen, and Sally A. Mizroch.....	415
"Movement patterns of bonefish, <u>Albia vulpes</u> , in Bahamian waters," by Douglas E. Colton and William S. Alevizon.....	148
Movement patterns	
bass, striped.....	420
bonefish.....	148
eel, Atlantic.....	487
fish, pelagic.....	569
rockfish.....	916
seal, harbor.....	291

"Movements of rockfish (<i>Sebastes</i>) tagged in northern Puget Sound, Washington," by Stephen B. Mathews and Morris W. Barker.....	916	cod, Atlantic.....	833
MOYLE, PETER B.--see DANIELS and MOYLE		dolphin.....	906
"The mud crab, <i>Panopeus herbstii</i> , s.l. partition into six species (Decapoda: Xanthidae)," by Austin B. Williams.....	863	dolphin, Fraser's.....	284, 286-288
"Mud crabs of the <i>Panopeus herbstii</i> H. M. Edw., s.l., complex in Alabama, U.S.A.," by Robert C. Reama and Austin B. Williams.....	885	haddock.....	883
MUIR, WILLIAM D.--see McCABE et al.		halibut, Greenland.....	600
Mussel, blue		herring, gold spot.....	588
gonad color.....	738	seal, harbor.....	293, 298
Long Island Sound.....	733	snapper, Hawaiian.....	523
reproductive cycle.....	735	tilefish.....	752
sex ratios.....	738	Otter trawl catches.....	543
<u>Mya arenaria</u> --see Clam, soft-shell		species.....	548-549
<u>Mycteroperca microlepis</u> --see Fish, reef		Otter, sea.....	501, 510-511
<u>Mycteroperca phenax</u> --see Fish, reef		OXENFORD, HAZEL A., and WAYNE HUNTE, "Age and growth of dolphin, <i>Coryphaena hippurus</i> , as determined by growth rings in otoliths".....	906
MYERS, KATHERINE W.--see BOND et al.		Oyster, American--see also Crab, mud	
<u>Mylocheilus caurinus</u> --see Peamouth		PCB's--see Contamination	
<u>Myoxocephalus octodecempinosus</u> --see Sculpin, longhorn		Pacific.....	363
<u>Mytilus edulis</u> --see Mussel, blue		climatic changes.....	363
NEAL, VICTOR T.--see QUINN and NEAL		<u>Pagrus pagrus</u> --see Fish, reef	
New Port River estuary, N.C.....	405	<u>Pandalus jordani</u> --see Shrimp, pink	
North Carolina.....	429	<u>Panopeus herbstii</u> --see Crab, mud	
Northern Mariana Islands.....	434	<u>Panopeus obesus</u> --see Crab, mud	
bait, skipjack tuna.....	434	<u>Paralithodes platypus</u> --see Crab, blue king	
"Notes on the marine life of the river lamprey, <i>Lampetra ayraei</i> , in Yaquina Bay, Oregon, and the Columbia River estuary," by Carl E. Bond, Ting T. Kan, and Katherine W. Myers.....	165	Parasite studies	
O'CONNOR, EDMUND F.--see OLIVER et al.		copepods.....	227
"The occurrence of spot, <i>Leiostomus xanthurus</i> , and Atlantic croaker, <i>Micropogonias undulatus</i> , larvae in Onslow Bay and Newport River estuary, North Carolina," by Robert M. Lewis and Mayo H. Judy.....	405	Parental biomass.....	723
<u>Odobenus rosmarus</u> --see Walrus		aga composition.....	723, 725, 726
<u>Odontaspis taurus</u> --see Shark, sand tiger		catch weight.....	724
OLIVER, JOHN S., PETER N. SLATTERY, EDMUND F. O'CONNOR, and LLOYD F. LOWRY, "Walrus, <u><i>Odobenus rosmarus</i></u> , feeding in the Bering Sea: A benthic perspective".....	501	management implications.....	726
OLIVER, JOHN S., PETER N. SLATTERY, MARK A. SILBERSTEIN, and EDMUND F. O'CONNOR, "A comparison of gray whale, <i>Eschrichtius robustus</i> , feeding in the Bering Sea and Baja California".....	513	sensitivity analysis.....	727
<u>Oncorhynchus kisutch</u> --see Salmon, coho		tuna, northern bluefin.....	726
<u>Oncorhynchus tshawytscha</u> --see Salmon, chinook		PARKER, KEITH R.--see BARTOO and PARKER, MacCALL et al.	
Onslow Bay, N.C.....	405	PARSONS, GLENN R., "The reproductive biology of the Atlantic sharpnose shark, <u><i>Rhizoprionodon terraenovae</i></u> (Richardson)".....	61
Opakapaka--see Snapper, Hawaiian		Pea digger--see Clam rake	
<u>Oregon II</u>	396	Peamouth.....	815
Oregon coast		<u>Penaeus aztecus</u> --see Shrimp, brown	
weather.....	456	<u>Penaeus duorarum</u> --see Shrimp, pink	
<u>Orthopristis chrysoptera</u> --see Pigfish		<u>Penaeus setiferus</u> --see Shrimp, white	
Otoliths		"Percent similarity: The prediction of bias," by E. L. Venrick.....	375
anchovy, northern.....	743	Perch, shiner.....	815
		Peruvian anchoveta fishery.....	363, 365
		PETERSON, C. H., P. B. DUNCAN, H. C. SUMMERSON, and G. W. SAFRIT, Jr., "A mark-recapture test of annual periodicity of internal growth band deposition in shells of hard clams, <u><i>Mercenaria mercenaria</i></u> , from a population along the southeastern United States".....	765
		PETERSON, CHARLES H., HENRY C. SUMMERSON, and STEPHEN R. FEGLEY, "Relative efficiency of two clam rakes and their contrasting impacts on seagrass biomass".....	429
		<u>Phocoena phocoena</u> --see Porpoise, harbor	
		Pigfish.....	847
		Cape Fear River Estuary, N.C.....	847
		haemulids.....	853
		larvae.....	847, 853
		morphology.....	852
		northern Gulf of Mexico.....	847

Pinfish--see Fish, seagrass	RV <u>Cayuse</u>	456
<u>Platichthys stellatus</u> --see Flounder, starry	RV <u>Dolphin</u>	538
<u>Pogonichthys macrolepidotus</u> --see Splittail	RV <u>Onslow Bay</u>	554
Pollock..... 124, 125, 131	RALSTON, STEPHEN, and GARRET T. MIYAMOTO, "Analyzing the width of daily otolith increments to age the Hawaiian snapper, <u>Pristipomoides filamentosus</u> ".....	523
Pollock, walleye..... 637	READ, A. J.--see SMITH et al.	
Alaskan waters..... 890	REAMS, ROBERT C., and AUSTIN B. WILLIAMS, "Mud crabs of the <u>Panopeus herbstii</u> H. M. Edw., s.l., complex in Alabama, U.S.A.".....	885
crustaceans, major food..... 639-640	Recreational fishing	
diets..... 637	bass fishery.....	168
embryos..... 891	Recruitment	
fish as food..... 639-640	fish, reef.....	680
incubators..... 891	mackerel, king.....	718
southeastern Alaska..... 637		
viable eggs only..... 891		
Polychlorinated biphenyls..... 389	"Redescription of larvae of the pigfish, <u>Orthopristis chrysoptera</u> Linnaeus (Pisces, Haemulidae)," by William Watson.....	847
concentration..... 392	Reef fisheries--see Fish, reef	
confirmation..... 392	REILLY, STEPHEN B., DALE W. RICE, and ALLEN A. WOLMAN, "Population assessment of the gray whale, <u>Eschrichtius robustus</u> , from California shore censuses, 1967-80," by Stephen B. Reilly, Dale W. Rice, and Allen A. Wolman.....	267
contamination..... 389, 395	Population studies--see also Catch estimation	
embryo toxicity..... 389	Population studies	
in fatty tissues of aquatic and land animals..... 389	fish, seagrass.....	837
"Population assessment of the gray whale, <u>Eschrichtius robustus</u> , from California shore censuses, 1967-80," by Stephen B. Reilly, Dale W. Rice, and Allen A. Wolman.....	porpoise, harbor.....	910
267	seal, harbor.....	291
	sole, yellowfin.....	671
	whale, gray.....	267
	Porpoise, harbor.....	660
	abundance, estimate.....	910, 913
	Campollo Island.....	910
	Charlotte County, N.B., Canada.....	660
	herring weirs.....	660
	population.....	661
	survey methods.....	910
	weir entrapment questionnaire.....	661
	western North Atlantic.....	910
Potato rake--see Clam rake	Power plant impact assessment: A simple fishery production model approach," by Alec D. MacCall, Keith R. Parker, Ronald Leithiser, and Bill Jessee.....	613
	Power plant impact assessment.....	613
	adult loss.....	613
	application, example.....	617
	criteria.....	617
	fishery management.....	615, 618
	larval growth.....	614
	long-term impact.....	614
	natural mortality.....	614
	short-term impact.....	614
	spawned eggs.....	614
POWER, JAMES H., and JAMES D. McCLEAVE, "Simulation of the North Atlantic Ocean drift of <u>Anguilla leptocephali</u> ".....	"The reproductive biology of the Atlantic sharpnose shark, <u>Rhizoprionodon terraenovae</u> (Richardson)," by Glenn R. Parsons.....	61
483	"Reproductive biology of the blueline tilefish, <u>Caulolatilus microps</u> , off North Carolina and South Carolina," Jeffrey L. Ross and John V. Merriner.....	553
Predation--see Mortality rates	Reproductive biology	
PRESCOTT, JOHN H.--see KRAUS et al.	crab, rock.....	357
<u>Prionace glauca</u> , blue shark.....	flounder, yellowtail.....	341
61, 69	halibut, Greenland.....	601
<u>Pristipomoides filamentosus</u> --see Snapper, Hawaiian	herring, gold spot.....	591
<u>Pseudopleuronectes americanus</u> --see Flounder, winter	mussel, blue.....	733
PUFFER, HAROLD W.--see WINKLER et al.	shark, Atlantic sharpnose.....	61
Purse seine fishery	shark, sand tiger.....	204
dolphin-yellowtail tuna.....	splittail.....	650
1	tilefish, blue-line.....	553
QUINN, WILLIAM H., and VICTOR T. NEAL, "Long-term variations in the Southern Oscillation, El Niño, and Chilean subtropical rainfall".....	"Review and analysis of the bluefin tuna, <u>Thunnus thynnus</u> , fishery in the eastern North Pacific Ocean," by Doyle A. Hanan.....	107
363	<u>Rhizoprionodon terraenovae</u> --see Shark, Atlantic sharpnose	
	<u>Rhomboplites aurorubens</u> --see Fish, reef	
	Ribbonfish	
	king-of-the-salmon, juvenile.....	161
	RICE, DALE W.--see REILLY et al.	
	RICHARDS, R. ANNE, J. STANLEY COBB, and MICHAEL J. FOGARTY, "Effects of behavioral interactions on the catchability of American lobster, <u>Homarus americanus</u> , and two species of <u>Cancer</u> crabs".....	51

ROBISON, BRUCE H., and JAMES E. CRADDOCK, "Meso- pelagic fishes eaten by Fraser's dolphin, <i>Legnodelphis hoaei</i> ".....	283	juvenile.....	787
		larvae.....	785
		metamorphosis.....	786
		northwest Atlantic.....	781
Rockfish		Sculpin, Pacific staghorn.....	815
black rockfish, <i>Sebastes melanops</i>	916	Sea bottom, features	
capture.....	918	furrows.....	504
copper rockfish, <i>Sebastes caurinus</i>	916	pits.....	504, 516, 519
northern Puget Sound, Wash.....	916	Seagrass	
quillback rockfish, <i>Sebastes maliger</i>	916	abundance of fishes.....	838
tagging.....	918	beds.....	841
yellowtail rockfish, <i>Sebastes flavidus</i>	916	biomass.....	429, 838
ROSS, JEFFREY L., and JOHN V. MERRINER, "Reproductive biology of the blue-line tilefish, <i>Caulolatilus microps</i> , off North Carolina and South Carolina".....	553	Seagrass bed.....	429
ROTHLISBERG, PETER C., and CHARLES B. MILLER, "Factors affecting the distribution, abundance, and survival of <i>Pandalus jordani</i> (Decapoda, Pandalidae) larvae off the Oregon coast".....	455	habitat.....	431-432
		<i>Halodule wrightii</i>	430
		<i>Zostera marina</i>	430
RUSSO, JOSEPH L.--see CRESSEY et al.		Seal, bearded.....	501, 509-511
Sablefish.....	415	Seal, fur	
gear.....	416	Bering Sea.....	121
migration.....	415, 417-420	food consumption.....	129
northeastern Pacific Ocean.....	415	fur seal rookeries.....	123
tagging.....	415, 416	future data collection.....	131
SAPRIT, G. W., Jr.--see PETERSON et al.		population indices.....	126, 130
		population trend.....	125
		pup deaths on the rookery.....	127
		suggested analyses.....	131
<i>Salmo gairdneri</i> --see Steelhead		Seal, harbor	
Salmon, chinook		chum salmon.....	292, 296
juveniles.....	815	haul-out.....	293-295, 298-299
Salmon, coho.....	412	otoliths.....	293, 298
Columbia River.....	143, 412	Netarts Bay, Oreg.....	291
fishery contribution.....	145	preys of.....	295-296
homing.....	144, 413, 414	pups.....	293-295
juveniles.....	815	tags.....	292, 296
survival.....	414	teeth.....	298
tags.....	412	Tillamook Bay, Oreg.....	291
transport.....	412	Whiskey Creek, Oreg.....	292
Willard Hatchery.....	412	"Seasonal changes in the ovaries of adult yellowtail flounder, <i>Limanda ferruginea</i> ," by W. Hunting Howell...	341
SALOMAN, CARL H.--see TRENT et al.		Seasonal effects	
Sand flat.....	429	anchovy, northern.....	741
Sardini.....	240	clam, hard.....	765
<i>Allothunnus</i> Serventy.....	243	flounder, winter.....	913
<i>Cybiosarda</i> Whitley.....	240	flounder, yellowtail.....	341
<i>Gymnosarda</i> Gill.....	243	mussel, blue.....	734
<i>Orcynopsis</i> Gill.....	240	pollock, walleye.....	890
<i>Sarda</i> Cuvier.....	241	shrimp, pink.....	455
SCHER, ANTHONY G.--see SULLIVAN et al.		"Seasonal variation in survival of larval northern anchovy, <i>Engraulis mordax</i> , estimated from the age of distribution of juveniles," by Richard D. Methot, Jr....	741
Scheffe's test.....	272-273, 275	<i>Sebastes</i> --see Rockfish	
SCHUBEL, J. R.--see ITZKOWITZ and SCHUBEL		Sexual maturity--see Reproductive biology	
Scomberomorini.....	233	Shad, American.....	815
<i>Scomberomorus</i> Lacepede.....	233, 236, 238-239	eggs.....	323
<i>Scomberomorus cavalla</i> --see Mackerel, king		fin development.....	330, 337
Scombrid phylogeny.....	252	larvae.....	323
historic.....	252	larval <i>Aloa</i> <i>spidissima</i>	324
parasite base.....	252	morphology.....	323, 336
Scombridae.....	260	myomeres.....	328, 336
Scombridae.....	246	Newfoundland, Canada to St. John's River, Fla.....	323
Scombrinae.....	232	pigmentation.....	333, 337
Scomberini.....	232	SHAKLEE, JAMES B., RICHARD W. BRILL, and ROBIN ACERRA, "Biochemical genetics of Pacific blue marlin, <i>Makaira</i> <i>nigricans</i> , from Hawaiian waters".....	85
<i>Rostrelliger</i> Jordan and Stark.....	232	Shark, Atlantic sharpnose.....	61
<i>Scomber</i> Linnaeus.....	232	Gulf of Mexico.....	61
Sculpin, longhorn		reproductive biology.....	63, 68-70
adult pigment.....	787	Shark, sand tiger.....	201
benthic behavior.....	788	cannibalistic period.....	213, 216
early development.....	781	early development.....	204, 206-210, 222-223
eggs.....	782	east-central coast of Florida.....	202
		late gestation period.....	217-218

mating activity.....	204	SMITH, G. J. D., A. J. READ, and D. E. GASKINS, "Incidental catch of harbor porpoise, <u>Phocoena phocoena</u> (L.), in herring weirs in Charlotte County, New Brunswick, Canada".....	660
oophagous stage.....	218	SMITH, TIM D., "Changes in size of three dolphin (<u>Stenella</u> spp.) populations in the eastern tropical Pacific".....	1
postcannibalistic period.....	217	Smoothtongue, northern.....	23
preparturition period.....	218	eggs and larvae.....	37
reproduction.....	222	identification.....	25, 36
Shell growth		morphology.....	27
clam, hard.....	697, 765	northeast Pacific.....	23
SHEPKER, JONATHAN M., "Distribution, size relationships, and food habits of juvenile king-of-the-salmon, <u>Trachipterus altivelis</u> , caught off the Oregon coast".....	161	osteology.....	25, 30
SHEPHERD, GARY, and CHURCHILL B. GRIMES, "Geographic and historic variations in growth of weakfish, <u>Cynoscion regalis</u> , in the Middle Atlantic Bight".....	803	pigmentation.....	26
SHERIDAN, PETER F., and DAVID L. TRIMM, "Summer foods of Texas coastal fishes relative to age and habitat"....	643	Snapper, Hawaiian	
SHERIDAN, PETER F.--see DIVITA et al.		gonads.....	526
SHERMAN, K., J. R. GREEN, J. R. COULET, and L. EJSYMONT, "Coherence in zooplankton of a large northwest Atlantic ecosystem".....	855	growth of whole fish.....	527, 532
Shrimp, brown.....	396, 789	otolith growth increments.....	524
foods of coastal fishes.....	396	sagittae.....	526
night trawl survey.....	396	size-frequency distribution.....	531
stomach contents.....	397	Sole, yellowfin.....	667
Texas estuaries to offshore waters.....	396	Bering Sea.....	667-668
Shrimp, deepwater pandalid		genetic population structure.....	668, 670
stock.....	434	Hokkaido, Japan.....	668
Shrimp, freshwater		north Pacific Ocean.....	667-668
Cane River, Jamaica.....	654, 658	SOMERTON, DAVID A., and RICHARD A. MacINTOSH, "The size at sexual maturity of blue king crab, <u>Paralithodes platypus</u> , in Alaska".....	621
catch.....	655-656, 658	Southern oscillation.....	363, 367, 371
eggs.....	656	indices.....	363, 365-366
growth.....	656, 658	long-term variations.....	367-369
maturity.....	655	Spawning--see Reproductive biology	
mortality.....	655-656	"Species associations and day-night variability of trawl-caught fishes from the inshore sponge-coral habitat, South Atlantic Bight," by Charles A. Wenner.....	537
Shrimp, pink.....	789	<u>Spirinchus thaleichthys</u> --see Smelt, longfin	
distribution and abundance.....	457	Spittail.....	647
growth rates.....	464	condition.....	650
larvae.....	455	feeding.....	651, 653
survival.....	465, 467, 469	growth.....	649, 653
Shrimp, white.....	789	life history.....	649
SILBERSTEIN, MARK A.--see OLIVER et al.		reproductive biology.....	650
"Simulation of the North Atlantic Ocean drift of <u>Anguilla leptocephali</u> ," James H. Power and James D. McCleave.....	483	Sacramento-San Joaquin estuary.....	647, 653
Simulation		Sport fishing--see Recreational fishing	
eel, Atlantic, movement patterns.....	484	Spot.....	789
yield per recruit model.....	681	infections.....	895
SINGLETON, KATHLEEN--see SULLIVAN et al.		larvae.....	407-410, 895
"Size at maturity and fecundity of rock crabs, <u>Cancer irroratus</u> , from the Bay of Fundy and southwestern Nova Scotia," by A. Campbell and M. D. Eagles.....	357	mean standard length.....	407-409, 411
"The size at sexual maturity of blue king crab, <u>Paralithodes platypus</u> , in Alaska," by David A. Somerton and Richard A. Macintosh.....	621	1972-73 season.....	407
"Size, sex ratio, and recruitment in various fisheries of king mackerel, <u>Scomberomorus cavalla</u> , in the southeastern United States," by Lee Trent, Roy O. Williams, Ronald G. Taylor, Carl H. Saloman, and Charles H. Menoch III.....	709	1973-74 season.....	408
SLATTERY, PETER N.--see OLIVER et al.		Squid.....	124, 129
SMAYDA, THOMAS J.--see DURBIN et al.		Steelhead	
Smelt, longfin.....	815	juveniles.....	815
Smelt, surf.....	815	<u>Stenella attenuata</u> --see Dolphin, spotted	
		<u>Stenella longirostris</u> --see Dolphin, spinner	
		Stickleback, threespine.....	815
		St. Lawrence, Gulf of.....	600
		"Stochastic age-frequency estimation using the von Bertalanffy growth equation," by Norman W. Bartoo and Keith R. Parker.....	91
		"Stomach contents of silver hake, <u>Merluccius bilinearis</u> , and Atlantic cod, <u>Gadus morhua</u> , and estimation of their daily rations," by E. G. Durbin, A. G. Durbin, R. W. Langton, and R. E. Bowman.....	437

Stomach contents.....	440	size structure.....	759
change in food habits.....	441	South Atlantic Bight.....	41
change, increasing fish length.....	440	southern New England.....	751
STONER, ALLAN W., "Distribution of fishes in seagrass meadows: Role of macrophyte biomass and species composition".....	837	tagging.....	663
<u>Striata</u> --see Fish, reef		U.S. east coast.....	41
Student-Newman-Kuel's test.....	272-275	Tilefish, blueline.....	552
SULKIN, S. D.--see VAN HEUKELEM et al.		fecundity.....	555, 557
SULLIVAN, BOLLING, KATIE MILLER, KATHLEEN SINGLETON, ANTHONY G. SCHEER, and AUSTIN B. WILLIAMS, "Electro- phoretic analyses of hemocyanins from four species of mud crabs, genus <u>Panopeus</u> , with observations on the ecology of <u>P. obsesus</u> ".....	883	gonad.....	554
"Summer foods of Texas coastal fishes relative to age and habitat," by Peter F. Sheridan and David L. Trimm.....	643	gonostomatic indices.....	554
SUMMERSON, H. C.--see PETERSON et al.		juveniles.....	556
Survey methods		ovaries.....	555, 566
porpoise, harbor.....	910	sex ratio.....	562, 566
"Survey of polychlorinated biphenyls in selected finfish species from United States coastal waters," by Donald F. Gadois and Richard S. Maney.....	389	sex transition.....	563, 566
"Survival and homing of juvenile coho salmon, <u>Oncorhynchus kisutch</u> , transported by barge," by George T. McCabe, Jr., Clifford W. Long, and Steve L. Leek.....	412	sexual maturity.....	562
SWARTZMAN, GORDON L., and ROBERT T. HAAR, "Inter- actions between fur seal populations and fisheries in the Bering Sea".....	121	spawning.....	557, 566
Tagging		"Tolerance of five-day-old winter flounder, <u>Pseudopleuronectes americanus</u> , larvae to thermal shock," by Norman Itzkowitz and J. R. Schubel.....	913
deepwater fish.....	663	<u>Trachipterus aitivellii</u> --see Ribbonfish	
detachable tags.....	664	TRENT, LEE, ROY O. WILLIAMS, RONALD G. TAYLOR, CARL H. SALOMAN, and CHARLES H. MANOOCH III, "Size, sex ratio, and recruitment in various fisheries of king mackerel, <u>Scorpaenomorus cavalla</u> , in the southeastern United States".....	709
rockfish.....	918	TRIMM, DAVID L.--see SHERIDAN and TRIMM	
sablefish.....	415	Tuna, bluefin	
tilefish.....	663-664	analyses.....	107, 113, 115
<u>Tautoglabrus adspersus</u> --see Cunner		catch.....	107
Taxonomy, scombrids.....	246	eastern North Pacific.....	107
TAYLOR, RONALD G.--see TRENT et al.		Tuna, southern bluefin	
"A technique for tagging deepwater fish," by C. B. Grimes, S. C. Turner, and K. W. Able.....	663	catch level.....	726
TEEL, DAVID J.--see GRANT et al.		TURNER, S. C., C. B. GRIMES, and K. W. ABLE, "Growth, mortality, and age/size structure of the fisheries for tilefish, <u>Lopholatilus chamaeleonticeps</u> , in the Middle Atlantic-southern New England region".....	751
"Temporal and spatial patterns of nearshore distribution and abundance of the pelagic fishes off San Onofre-Oceanside, California," by Larry G. Allen and Edward E. DeMartini.....	569	TURNER, S. C.--see GRIMES et al.	
<u>Theragra chalcogramma</u> --see Pollock, walleye		UTTER, FRED M.--see GRANT et al.	
THORSEN, KENNETH--see WESPSTAD et al.		VAN HEUKELEM, W., M. C. CHRISTMAN, C. E. EPIFANTIO, and S. D. SULKIN, "Growth of <u>Geryon quinquegens</u> (Brachyura: Geryonidae) juveniles in the laboratory"....	903
Thunnini.....	243	"Variability in median size and age at sexual maturity of Atlantic cod, <u>Gadus morhua</u> , on the Scotian Shelf in the northwest Atlantic Ocean," by Terry D. Beacham.....	303
<u>Axiu</u> Cuvier.....	243	"Variation in the growth rate of <u>Mya arenaria</u> and its relationship to the environment as analyzed through prin- cipal components analysis and the parameter of the von Bertalanffy equation," by Richard S. Appeldoorn....	75
<u>Euthynnus</u> Lutken in Jordan and Gilbert.....	244	VENRICK, E. L., "Percent similarity: The prediction of bias".....	375
<u>Katsuwonus</u> Kishinouye.....	244	VERITY, PETER G.--see DURBIN et al.	
Subgenus <u>Neothunnus</u> Kishinouye.....	245	Von Bertalanffy growth equation	
Subgenus <u>Thunnus</u> South.....	245	age-frequency estimation.....	92
<u>Thunnus</u> South.....	244	bonito, Pacific.....	93
<u>Thunnus thynnus</u> --see Tuna, bluefin		clam, soft-shell.....	75, 78
Tilefish		mackerel, king.....	104
age.....	756, 760-762	otolith growth.....	530
electrophoresis.....	42, 43	VREELAND, ROBERT R., and ROY J. WAHLE, "Homing and fisheries contribution of marked coho salmon, <u>Oncorhynchus kisutch</u> , released at two Columbia River locations".....	143
growth models.....	757, 760	Wagner Tree.....	253-255, 259
Gulf of Mexico.....	41	WAHLE, ROY J.--see VREELAND and WAHLE	
length & weight relationship.....	758	Walrus.....	501
Middle Atlantic Bight.....	41, 751	Bering Sea.....	502
morphology.....	42, 44, 47	benthic feeding record.....	503
otoliths.....	752, 755	effect on benthic communities.....	507
		effects on bottom distribution.....	510

feeding behavior.....	509	predator-prey size relationships.....	632
furrow.....	503-504, 510	west coast of North America.....	629
interaction among marine mammals.....	510		
pit.....	503-504, 509-511	WHORISKEY, F. C., Jr., "Intertidal feeding and refuging by cunners, <u>Tautoglabrus adspersus</u> (Labridae)".	426
shells.....	504, 510		
tusks.....	510	WILLIAMS, AUSTIN B., "The mud crab, <u>Panopeus herbstii</u> , s.l. partition into six species (Decapoda: Xanthidae)".	863
"Walrus, <u>Odobenus rosmarus</u> , feeding in the Bering Sea: A benthic perspective," by John S. Oliver, Peter N. Slattery, Edmund F. O'Connor, and Lloyd F. Lowry.....	501	WILLIAMS, AUSTIN B.--see REAMS and WILLIAMS; SULLIVAN et al.	
WALSH, WILLIAM A., and WILLIAM A. LUND, Jr., "Early development of the longhorn sculpin, <u>Myoxocephalus octodecemspinosus</u> ".	781	WILLIAMS, MARK L.--see JOHNSON et al.	
WATSON, WILLIAM, "Redescription of larvae of the pigfish, <u>Orthopristis chrysoptera</u> Linnaeus (Pisces, Haemulidae)".	847	WILLIAMS, ROY O.--see TRENT et al.	
Weakfish		WILLIAMS, VERN R., and THOMAS A. CLARKE, "Reproduction, growth, and other aspects of the biology of the gold spot herring, <u>Herklotsichthys quadrimaculatus</u> (Clupeidae), a recent introduction to Hawaii".	587
age determination.....	805	WILTON, DONALD P.--see MENZ and WILTON	
annulus measurement.....	805	WINKLER, DELAINE L., KEITH L. DUNCAN, JO ELLEN ROSE, and HAROLD W. PUFFER, "Effects of benzo(a)pyrene on the early development of California grunion, <u>Leuresthes tenuis</u> (Pisces, Atherinidae)".	473
growth in weight.....	807	"Winter and altered spring movements of striped bass in the Savannah River, Georgia," by Richard G. Dudley and T. Glenn McGahee.....	420
length at age.....	805-806	WOLMAN, ALLEN A.--see REILLY et al.	
Middle Atlantic Bight.....	803	"Yield per recruit models of some reef fishes of the U.S. South Atlantic Bight," by Gene R. Huntsman, Charles S. Manooch III, and Churchill B. Grimes.....	679
WENNER, CHARLES A., "Species associations and day-night variability of trawl-caught fishes from the inshore sponge-coral habitat, South Atlantic Bight".	537	Zooplankton.....	855
WESPESTAD, VIDAR G., KENNETH THORSEN, and SALLY A. MIZROCH, "Movement of sablefish, <u>Anoplopoma fimbria</u> , in the northeastern Pacific Ocean as determined by tagging experiments (1971-80)".	415	abundance.....	857
Whale, gray.....	510-511	coherence in dominance.....	856
analysis methods.....	270, 272, 277	coherent patterns of biomass.....	855
calving lagoon.....	513-514, 517-518	measurement.....	857
feeding behavior.....	514, 520	mesoscale changes.....	855
infaunal prey.....	517	northwest Atlantic.....	855
migration.....	267	observation.....	857
migratory timing.....	274	sampling studies.....	381
population assessment.....	267	species shifts in dominance.....	857
visibility.....	275		
Whiting, Pacific.....	629		
daily ration.....	635		
diel feeding pattern.....	634		
food.....	630		