

PAM FILE

Johnston Atoll

NATIONAL WILDLIFE REFUGE

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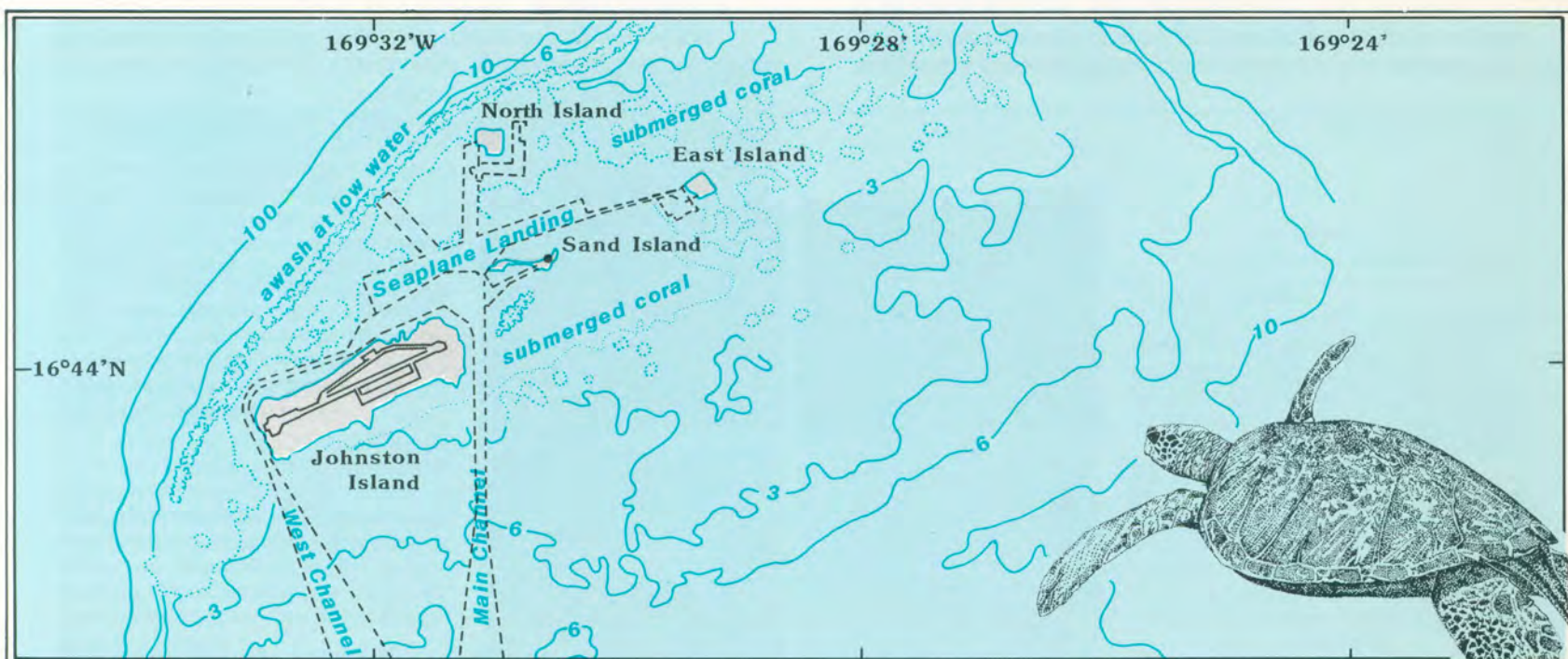
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Johnston Atoll National Wildlife Refuge

Description

Johnston Atoll National Wildlife Refuge is a coral atoll near the center of the North Pacific between the Hawaiian Islands and the Marshall Islands. Located 717 nautical miles southwest of Oahu, and 450 nm south of French Frigate Shoals in the Northwest Hawaiian Islands (at 16°45' N, 169°31' W), it is one of the most isolated atolls in the world. It rests on the core of an ancient volcanic island now buried under a limestone cap thousands of feet thick which resulted from 70 million years of reef growth on the slowly sinking island. Today, Johnston Atoll is a broad shallow platform of approximately 50 square miles with a marginal reef emergent only on the northwest. Four small islands (Johnston, Sand, North and East) emerge from the lagoon.

Though the shallow reefs of the atoll are lush and varied, the deep surrounding ocean is a biological desert. In the warm westwardly flowing stream of the North Equatorial Current, few nutrients rise to the surface and the microscopic plant life which supports all other marine creatures is sparse. Flowing around the atoll, the current is diverted and turbulence brings the nutrients of deeper water to the surface. This creates a wake of richer marine life downstream (west) and a feeding ground for the thousands of seabirds which roost and breed on the islands.



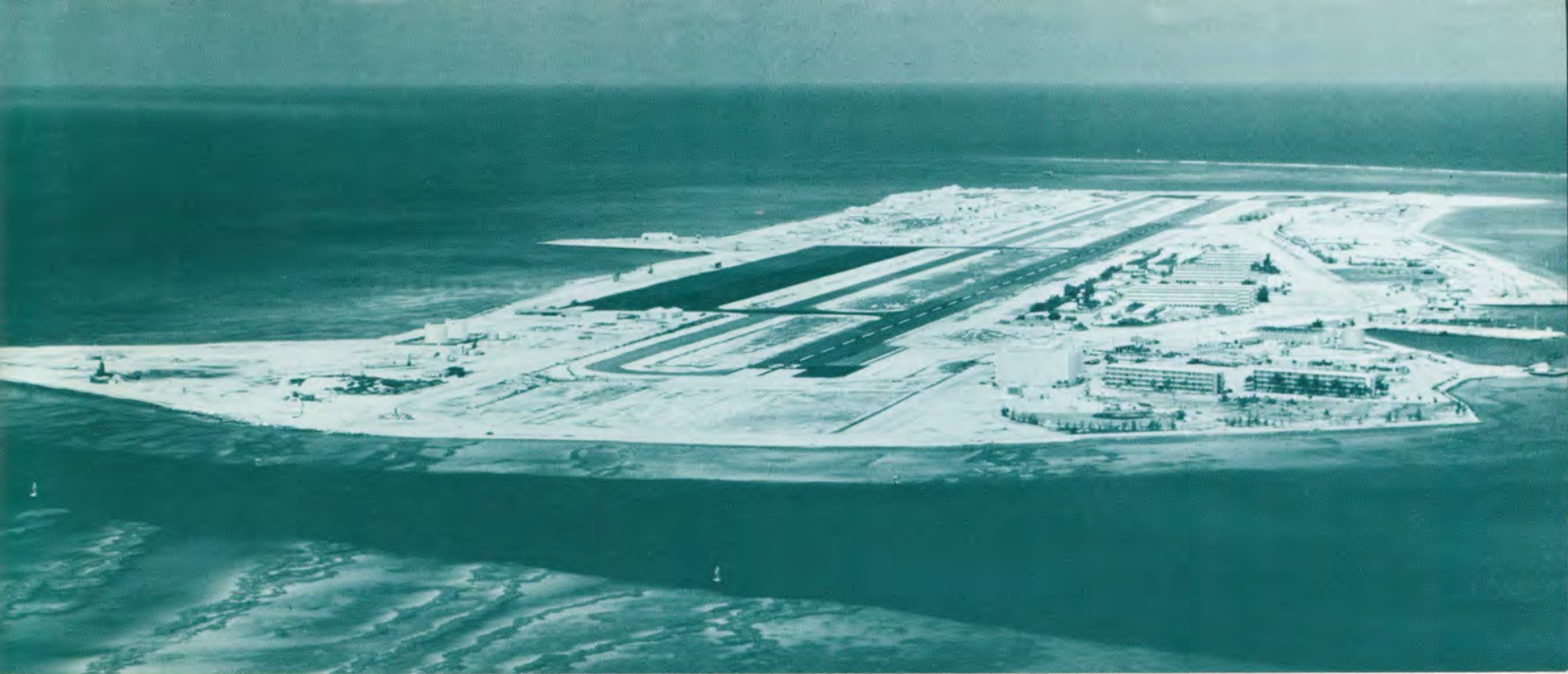
History

Johnston Atoll was accidentally discovered on September 2, 1796 by Captain Joseph Pierpont of the American Brig SALLY. He published a notice of his ship's grounding in several American newspapers in 1797, giving an accurate position and noting the two original islands (Johnston and Sand) and the incomplete marginal reef. No traces or records of any earlier visitations or occupations by Polynesians or Europeans during their voyages of discovery exist. Lt. William Smith of HMS CORNWALLIS named the larger island for his ship's captain, Charles J. Johnston, after sighting it briefly on December 14, 1807.

The Guano Act of 1856 granted Americans the privilege of removing guano, the accumulation of sea bird excrement, from nearly 30 central Pacific islands claimed by the United States. For several years guano was removed from Johnston and Sand Islands before the operation was abandoned in the late 1800's. In 1923 the Biological Survey of the U.S. Department of Agriculture and the Bishop Museum visited the islands with a scientific expedition to study the bird and marine life. Their findings resulted in Executive Order 4467 of President Calvin Coolidge designating the islands as a bird refuge. In 1934 by

Executive Order 6935, Franklin D. Roosevelt placed the atoll under the Navy while retaining the earlier provisions for refuge designation and protection. Navy development began in earnest in 1936 with reef blasting, dredging, landfilling and grading and construction on the islands. The atoll was briefly shelled by Japanese naval units shortly after the Pearl Harbor attack but combat soon shifted west and the island's role changed from an outpost to an aircraft and submarine stopover and refueling base.

In the late 50's and early 60's a series of high-altitude nuclear tests brought new activity and attention to Johnston atoll. A series of dredge and fill projects completed in 1964 brought the size of Johnston Island up to 625 acres from its original 46, increased Sand Island from 10 to 22 acres, and added two manmade islands, North (Akau) and East (Hikina) of 25 and 18 acres. Today Johnston Atoll remains an unincorporated territory of the United States with operational control held by the Defense Nuclear Agency (DNA). The atoll is maintained as a storage site for chemical munitions and as a standby test site should the United States ever decide to resume atmospheric testing of nuclear weapons.



Johnston Island

Atoll Ecology

As the only shallow water and dry land area in millions of square miles of ocean, Johnston is an oasis for reef and bird life. Corals and coralline algae are responsible for the existence of the atoll. Though corals are true animals, colonies of microscopic symbiotic algae are contained in their tissues. The algae contribute their photosynthetic production to the coral, receiving in return secure space in the sun and the coral's wastes as nutrients. While fewer species of coral are found here than in Hawaii, a few species not found in Hawaii dominate the reefs of the atoll. Most impressive is the table *Acropora* (*A. cyatherea*) forming massive colonies up to 10 feet in diameter. The diversity of other reef life such as molluscs, crabs, and urchins, is also less than in Hawaii. The reduced fauna, however, does include some species from the western and south Pacific not found in Hawaii.

About 280 species of fish have been recorded from the reefs and inshore waters of Johnston Atoll. This is a much smaller number than the estimate for Hawaii (about 680 species) or the Marshall Islands (about 820 species). The lack of species is probably due to the atoll's isolation, small size and lack of habitat diversity. Most of the fish species also occur in Hawaii and all probably occur elsewhere. The majority of the fishes are edible though some may very rarely retain a poison within their flesh known as **ciguatoxin**. The poison is produced by a microscopic alga that is eaten by fishes browsing along the bottom. The poison can then concentrate in the flesh (particularly the liver) of large carnivorous species primarily eels.

Endangered Species

Two unique forms of marine life found at Johnston Atoll are protected under Federal laws controlling threatened and endangered species. These species are the **green sea turtle**, *Chelonia mydas*, and the **Hawaiian monk seal**, *Monachus schauinslandi*.

Sea turtles are reptiles which spend their entire lives at sea except for brief visits ashore to deposit their eggs in pits dug in sandy areas above the high tide mark. The new hatchlings can fit in a hand but the adults can grow quite large (300 - 400 pounds) and may take 30 - 40 years to reach breeding maturity. Turtles are highly vulnerable to human predation and disturbance. Many turtles at Johnston have been tagged by researchers seeking to understand migration routes and estimate growth, reproduction and mortality. The tag recovery of a nesting female on a beach at French Frigate Shoals indicates the Johnston population probably nests there.



Hawaiian Monk Seal and Pup

The monk seal, found primarily in the Northwest Hawaiian Islands, occasionally occurs at Johnston. The species has declined sharply in historical times as a result of human harvesting and disturbance of breeding colonies. They feed on fish and crustaceans from the reef and lagoon and, although able to spend long periods at sea, often haul out on sandy beaches to bask in the sun. Nine seals were translocated to Johnston from Laysan Island in 1984 and one or two of these tagged individuals have taken up permanent residence.

Migratory Birds

Most of the birds that occur at Johnston Atoll are seabirds. Seabirds obtain their food from the sea and generally possess webbed feet and beaks adapted for feeding on fish. They also have characteristic internal salt glands which make it possible for them to drink sea water. Long narrow wings efficient for soaring are found in many species. Seabirds evolved on islands where natural predators were absent. Compared to other birds, they produce fewer young over their lifetime. Seabirds mate for life and both males and females incubate, brood and feed their young.

Other migratory birds occurring at Johnston Atoll include species which breed in Alaska, Canada, the mainland United States and Asia and migrate to the Central Pacific for wintering. These include shorebirds and waterfowl. The following species descriptions detail information on the birds that regularly occur at Johnston.

Shearwaters and Petrels

Shearwaters and Petrels are small to medium-sized birds distinguished by a hook-end bill with nostril tubes on the upper bill. They are related to the much larger albatross which once

nested on Johnston. They feed by plunging or seizing prey at the surface. Their natural longevity is around 20 years.

Bulwer's Petrel

The Bulwer's Petrel is the smallest of the group. They are sooty-brown birds with lighter bars on the upper wing, a short wedge-shaped tail and black legs and feet. Only a few pairs of this species occur at Johnston.



Petrel chick



Wedgetailed Shearwater

Christmas Shearwater

Christmas Shearwaters have a short rounded tail and dark plumage, legs and feet. Competition with the larger wedge-tails is probably responsible for limiting their abundance to less than 100 birds at Johnston.



Bulwer's Petrel



Wedgetailed Shearwaters

Wedge-tailed Shearwaters

The Wedge-tailed Shearwater is the largest of the local shearwaters, has a distinctly wedge-shaped tail, and flesh colored legs and feet. The single egg is laid in a chamber at the end of a burrow that may be six feet long. Burrows are dug with the bill and feet and reexcavated and renovated before each breeding season. Three to four thousand of these birds use the natural portion of Sand Island where the dense roots of the *Lepturus* grass support the burrow walls. Their unique moaning calls at night can give the colonies an eerie character.

Tropicbirds, Frigatebirds and Boobies

These are medium sized to very large birds, distantly related to the pelicans of temperate waters. All have webbing over all four toes and an inflatable gular (throat) pouch. All move poorly on the ground with short, weak legs. Although adults of each

species are distinctly different, the chicks are generally similar, born naked (some tropicbirds are downy) and blind. Longevity from tropicbirds and boobies ranges from 16 to 20 years. Frigatebirds may live more than 30 years.

Red-tailed Tropicbird

Red-tailed tropicbirds are white birds distinguished by two long, thin red tailfeathers. The bill is bright red, and the eyes lined with black. Immature birds have black barring over the back and upper wing surfaces. They are tolerant of human activity but susceptible to cat, dog and rat predation. Several thousand utilize Johnston Island, the current population probably having increased with greater vegetation.



Red-tailed Tropicbird



Brown Booby

White-tailed Tropicbird

White-tailed tropicbirds are white birds with two long, thin white tail feathers. The wing edges are lined with black as are the eyes, and the bill is yellow. Viewed from below, the birds appear pure white. This species prefers to nest on cliffs but nests have recently been found on the ground under shrubs on Johnston Island.

Great Frigatebird

The Great frigatebird or "iwa" in Hawaiian, is the largest seabird on Johnston. It has a forked tail, hooked bill and the adult males possess a bright red throat pouch. Among the most efficient of soarers, it glides on the wind or thermal updrafts, often harassing other seabirds and stealing their catch. Their aggressive habits extend to the nesting grounds where they will take unattended eggs and chicks of even their own species.



Great Frigatebird



Brown Booby

Brown Booby

The Brown Booby has a deep chocolate brown back and upper wing surfaces and a sharply delineated white chest and underwing. Prey is taken by diving into the water followed by underwater pursuit. It builds a cup-like nest of dried vegetation and lays two eggs. Usually only one chick is reared successfully. This species is a year-round resident with perhaps several hundred birds feeding in the lagoon and near-shore waters.



Great Frigatebird



Red-footed Booby

Red-footed Booby

The Red-footed Booby has a white body and wings except for dark tips. The legs and feet are an unmistakable bright red. The beak is light blue. Sand and East Island support several dozen breeding pairs. The total population numbers in the thousands in early spring but most are non-breeders.

Terns and Noddies

Terns are small to medium-sized birds with narrow graceful wings and thin sharp bills. They feed by plunging or picking and snatching prey from the surface. Most terns nest colonially and

usually show strong individual pair bonding and colonial "site tenacity". Tern chicks are born with down and open eyes.

Gray-backed Tern

Gray-backed terns are smaller than sooty terns but similar in general appearance. The upper surfaces are gray, and the white blaze over the face and eyes extends well behind the eyes. Nesting in this species begins early in the year since harassment by sooty terns can severely reduce breeding success. Several hundred breed on Sand, North and East Islands.



Gray-backed Tern



Sooty Tern

Sooty Tern

The Sooty tern sports long narrow wings and is dusky black on top and white on the neck and belly. The forked tail and harsh screeching call distinguish this bird. This is Johnston's most abundant bird with an estimated 50,000 - 100,000 breeding pairs. The colony was originally located on Johnston and Sand Islands. As human activity increased on Johnston, the entire colony moved to Sand Island and, recently, to East Island.

White Tern

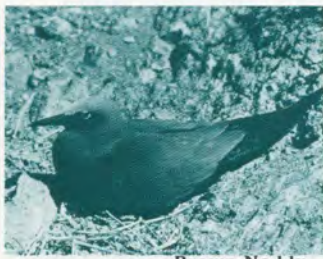
The white tern is unmistakable with its pure white plumage and black bill. Its habit of fluttering curiously over visitors assures that its presence will be noticed. A single egg is laid directly on a tree branch, a ledge, or on any suitable surface. The growth of trees on Johnston and control of the cat population insures that the population of this attractive bird will continue to increase.



White Terns

Brown Noddy

Brown noddy terns are gray-brown birds with an indistinct gray-white forehead and crown. The legs, feet and bill are black. Their common name comes from the stereotyped head nodding courtship displays between adults. Several thousand nest on Sand, North and East Islands, making this the second most numerous species using Johnston Atoll.



Brown Noddy

Black Noddy

The black noddy (also known as the white-capped or Hawaiian noddy) is smaller and darker than the brown noddy. The white on the forehead and crown is more distinct and extends farther back. Black noddies are common on Johnston with many pairs nesting in trees on the main part of Johnston Island.



Black Noddy



Sooty Tern

Shorebirds

Migratory shorebirds are commonly seen on Johnston during the winter months. Shorebirds typically feed near the water's edge, but can also be found in mixed flocks working grassy or

gravelly areas. In some cases shorebirds prey upon the eggs of the seabird colonies.

Golden Plover

The golden plover is distinguished by gold spotting on the wings and back and a white stripe over the eye and down the neck. The long legs are a light gray-brown. Winter months are spent in the tropics feeding and preparing for the spring flight to the arctic breeding grounds. The migration flights are made directly from the atoll to the arctic and the birds remain in the air for up to seven days. Several hundred plover may be present on Johnston during the winter.



Golden Plover



Bristle-thighed Curlews

Bristle-thighed Curlew

The bristle-thighed curlew is a large brown shorebird with a long decurved bill. It has an unbarred rusty tail, a brown back and a light stripe over the eye. Its voice is a sharp "curlew" repeated. It breeds on the tundra in Alaska and arrives on the atoll in August and September.

Ruddy Turnstone

Ruddy turnstones are small distinctly marked shorebirds with a bar and blotch pattern of black on white and short reddish legs. Their migratory pattern is believed to consist of a direct flight from the arctic to the atoll in the fall, and a coastal return via the western Pacific, Japan and Siberia in the spring.



Ruddy Turnstone

Waterfowl

Three species of ducks occur fairly regularly on Johnston Atoll. They include the northern pintail, American wigeon and northern shoveler. These ducks breed in North America and are regular winter migrants to Hawaii.

Bird List

Resident Nesting Seabirds	Abundance	Nesting Habit	Adult Wing Span (inches)
Bulwer's Petrel	u	2,6	23
Wedge-tailed Shearwater	c	1	38
Christmas Shearwater	u	2,6	32
White-tailed Tropicbird	u	6	38
Red-tailed Tropicbird	a	2,3	44
Brown Booby	u	3	54
Red-footed Booby	c	4	40
Great Frigatebird	c	4	90
Gray-backed Tern	u	3	29
Sooty Tern	a	3	34
Brown Noddy	a	3,4	33
Black Noddy	c	4	29
White Tern	c	5	28
Non-Nesting/Non-Resident Seabirds			
Black-footed Albatross	r		89
Laysan Albatross	r		82
Townsend's Shearwater	r		13
Phoenix Petrel	x		14
Sooty Storm Petrel	x		22
Red-billed Tropicbird	r		24
Masked (Blue-faced) booby	r		60
Lesser Frigatebird	x		90
Laughing Gull	x		41
Franklin's Gull	x		35
Herring Gull	x		52
Glaucous Winged Gull	x		53
Elegant Tern	x		37
Blue-gray Noddy	r		24

Migratory Shorebirds	Abundance
Black-bellied Plover	x
Golden Plover	c
Semipalmated Plover	x
Lesser Yellowlegs	x
Willet	x
Wandering Tattler	u
Spotted Sandpiper	x
Bristle-thighed Curlew	u
Ruddy Turnstone	c
Sanderling	u
Western Sandpiper	x
Pectoral Sandpiper	x
Sharp-tailed Sandpiper	x
Buff-breasted Sandpiper	x
Ruff	x
Short-billed Dowitcher	x
Wilson's Phalarope	x



Nesting Habit

- 1 - Burrow
- 2 - Rock Crevice
- 3 - Ground
- 4 - Shrub or Tree
- 5 - Branch or Ledge
- 6 - Under Vegetation

Accidentals, Stragglers or Waterfowl

Peregrine Falcon	x
Short-eared Owl	x
Cattle Egret	r
Northern Pintail	r
American Wigeon	r
Northern Shoveler	x
Skylark	x
Japanese White Eye	x

Abundance

- a - Abundant (numerous common species)
- c - common (certain to be seen in suitable habitat)
- u - Uncommon (present, but not certain to be seen)
- r - Rare (seen only a few times a year or not at all)
- x - Accidental (not normally expected)

Wildlife Regulations

The Commanding Officer at Johnston Atoll has prescribed regulations concerning wildlife which reflect and support Federal laws and National Wildlife Refuge Regulations. It is prohibited for any person to harass, willfully disturb, hunt, trap, capture, or kill any bird or to take the eggs of any bird. It is also prohibited to harass, willfully disturb, hunt, trap, capture or kill any individual of any species designated as threatened or endangered (sea

turtles, Hawaiian monk seals). Entry to North and East islands and the eastern part of Sand island is controlled during the birds' breeding season (Feb. 1-Sept. 1). Fishing and shell and coral collecting are permitted for recreation. Lobster fishing is also permitted within prescribed seasonal, size and gear limitations. Detailed regulations are listed in FCJ Instruction 5000.4.