

percent earned less than \$205, and the highest 10 percent earned more than \$526.

Median hourly earnings of graders and sorters, agricultural products were \$7.11 in 2000. The middle 50 percent earned between \$6.34 and \$8.78. The lowest 10 percent earned less than \$5.87, and the highest 10 percent earned more than \$11.18.

Median hourly earnings of agricultural inspectors were \$13.75 in 2000. The middle 50 percent earned between \$10.61 and \$17.85. The lowest 10 percent earned less than \$8.79, and the highest 10 percent earned more than \$21.91.

Few agricultural workers are members of unions.

Related Occupations

The duties of farmworkers who perform outdoor labor are related to the work of fishers and fishing vessel operators; forest, conservation, and logging workers; and grounds maintenance workers. Farmworkers who work with farm and ranch animals perform work related to that of animal care and service workers. The work of agricultural inspectors and graders and sorters is related to work performed by inspectors, testers, sorters, samplers, and weighers in manufacturing industries.

Sources of Additional Information

Information on jobs as agricultural workers is available from:

► National FFA Organization, The National FFA Center, Career Information Requests, P.O. Box 68690, Indianapolis, IN, 46268-0960. Internet: <http://www.ffa.org>

Information on farmworker jobs is available from:

► The New England Small Farm Institute, 275 Jackson St., Belchertown, MA 01007. Internet: <http://www.smallfarm.org/newoof/companions.html>

Information on obtaining a position as an agricultural inspector with the Federal Government is available from the Office of Personnel Management (OPM) through a telephone-based system. Consult your telephone directory under U.S. Government for a local number or call (912) 757-3000; Federal Relay Service: (800) 877-8339. The first number is not tollfree, and charges may result. Information also is available from the OPM Internet site: <http://www.usajobs.opm.gov>

Fishers and Fishing Vessel Operators

(O*NET 45-3011.00)

Significant Points

- Over 60 percent of the workers are self-employed, among the highest proportion in the workforce.
- Many jobs require strenuous work and long hours, and provide only seasonal employment.
- Employment is projected to decline, due to depletion of fish stocks and new Federal and State laws restricting both commercial and recreational fishing.

Nature of the Work

Fishers and fishing vessel operators catch and trap various types of marine life for human consumption, animal feed, bait, and other uses. (Aquaculture—the raising and harvesting for commercial purposes of fish and other aquatic life in ponds or confined bodies of water—is covered in the *Handbook* statement on farmers, ranchers, and agricultural managers.)

Fishing hundreds of miles from shore with commercial fishing vessels—large boats capable of hauling a catch of tens of thousands

of pounds of fish—requires a crew including a captain, or skipper, a first mate and sometimes a second mate, boatswain (called a deckboss on some smaller boats), and deckhands with specialized skills.

The *fishing boat captain* plans and oversees the fishing operation—the fish to be sought, the location of the best fishing grounds, the method of capture, the duration of the trip, and the sale of the catch.

The captain ensures the fishing vessel is seaworthy; oversees the purchase of supplies, gear, and equipment such as fuel, netting, and cables; obtains the required fishing permits and licenses; and hires qualified crew members and assigns their duties. The captain plots the vessel's course, using navigation instruments and aids such as compasses, sextants, and charts, in addition to electronic navigational equipment such as autopilots, loran systems, and satellite navigation systems. Ships also use radar to avoid obstacles and depth sounders to indicate the water depth and the existence of marine life between the vessel and sea bottom. Sophisticated tracking technology allows captains to better locate and analyze schools of fish. The captain directs the fishing operation through the officers, and records daily activities in the ship's log. Upon returning to port, the captain arranges for the sale of the catch—directly to buyers or through a fish auction—and ensures that each crew member receives the prearranged portion of adjusted net proceeds from the sale of the catch. Some captains have begun buying and selling fish via the Internet; and as electronic commerce grows as a method to find buyers for fresh catch, more captains may use computers.

The *first mate*—the captain's assistant, who must be familiar with navigation requirements and the operation of all electronic equipment—assumes control of the vessel when the captain is off duty. Duty shifts, called watches, usually last 6 hours. The mate's regular duty, with the help of the boatswain and under the captain's oversight, is to direct the fishing operations and sailing responsibilities of the deckhands. These include the operation, maintenance, and repair of the vessel, and the gathering, preservation, stowing, and unloading of the catch.

The *boatswain*, a highly experienced deckhand with supervisory responsibilities, directs the *deckhands* as they carry out the sailing and fishing operations. Before departure, the boatswain directs the deckhands to load equipment and supplies, either by hand or with hoisting equipment, and to untie lines from other boats and the dock. When necessary, boatswains repair fishing gear, equipment, nets, and accessories. They operate the fishing gear, letting out and pulling in nets and lines. They extract the catch such as pollock, flounder, menhaden, and tuna, from the nets or lines' hooks. Deckhands use dip nets to prevent the escape of small fish and gaffs to facilitate the landing of large fish. They then wash, salt, ice, and stow away the catch. Deckhands also must ensure that decks are clear and clean at all times and the vessel's engines and equipment are kept in good working order. Upon return to port, they secure the vessel's lines to and from the docks and other vessels. Unless "lumpers" (laborers or longshore workers) are hired, the deckhands unload the catch.

Large fishing vessels that operate in deep water generally have technologically advanced equipment, and some may have facilities on board where the fish are processed and prepared for sale. Such vessels are equipped for long stays at sea and can perform the work of several smaller boats.

Some full-time and many part-time fishers work on small boats in relatively shallow waters, often in sight of land. Navigation and communication needs are vital and constant for almost all types of boats. Crews are small—usually only one or two people collaborate on all aspects of the fishing operation. This may include placing gill nets across the mouths of rivers or inlets, entrapment nets in bays and lakes, or pots and traps for fish or shellfish such as



Although fishing has become more mechanized, netting and hauling the catch aboard is strenuous work.

lobsters and crabs. Dredges and scrapes are sometimes used to gather shellfish such as oysters and scallops. A very small proportion of commercial fishing is conducted as diving operations. Depending upon the water's depth, divers—wearing regulation diving suits with an umbilical (air line) or a scuba outfit and equipment—use spears to catch fish and use nets and other equipment to gather shellfish, coral, sea urchins, abalone, and sponges. In very shallow waters, fish are caught from small boats having an outboard motor, from rowboats, or by wading or seining from shore. Fishers use a wide variety of hand-operated equipment—for example, nets, tongs, rakes, hoes, hooks, and shovels—to gather fish and shellfish; catch amphibians and reptiles such as frogs and turtles; and harvest marine vegetation, such as Irish moss and kelp.

Although historically most fishers were involved with the traditional commercial fishery, some captains and deckhands are primarily employed in support of the sport or recreational fishery. Typically, a group of people charter a fishing vessel—for periods ranging from several hours to a number of days—for sport fishing, socializing, and relaxation and employ a captain and possibly several deckhands. This industry had experienced significant growth in the 1970s and 1980s, but declined in the 1990s because of the limited availability of fish.

Working Conditions

Fishing operations are conducted under various environmental conditions, depending on the region of the country and the kind of species sought. Storms, fog, and wind may hamper fishing vessels. Divers are affected by murky water and unexpected shifts in underwater currents. In relatively busy fisheries, smaller boats have to take care not to be hit by larger vessels.

Fishers and fishing vessel operators work under hazardous conditions, and often help is not readily available. Malfunctioning navigation or communication equipment may lead to collisions or shipwrecks. Malfunctioning fishing gear poses the danger of injury to the crew, who also must guard against entanglement in fishing nets and gear, slippery decks resulting from fish processing operations, ice formation in the winter, or being swept overboard—a fearsome situation. Also, treatment for any serious injuries may have to await transfer to a hospital. Divers must guard against entanglement of air lines, malfunction of scuba equipment, decompression problems, and attacks by predatory fish.

Fishers and fishing vessel operators face strenuous outdoor work and long hours. Commercial fishing trips may require a stay of

several weeks, or even months—hundreds of miles away from home port. The pace of work may vary, but even during travel between home port and the fishing grounds, deckhands on smaller boats try to finish their cleaning duties so that there are no chores remaining to be done at port. However, lookout watches are a regular responsibility, and crew members must be prepared to stand watch at prearranged times of the day or night. Although fishing gear has improved, and operations have become more mechanized, netting and processing fish are strenuous activities. Whereas newer vessels have improved living quarters and amenities, such as television and shower stalls, crews still experience the aggravations of confined conditions, continuous close personal contact, and the absence of family.

Employment

Fishers and fishing vessel operators held an estimated 53,000 jobs in 2000. More than 6 out of 10 were self-employed. Besides fishing conducted primarily to harvest food, some jobs involved sport fishing activities.

Training, Other Qualifications, and Advancement

Fishers usually acquire occupational skills on the job, many as members of families involved in fishing activities. No formal academic requirements exist. Operators of large commercial fishing vessels are required to complete a Coast Guard-approved training course. Students can expedite their entrance into these occupations by enrolling in 2-year vocational-technical programs offered by secondary schools. In addition, some community colleges and universities offer fishery technology and related programs that include courses in seamanship, vessel operations, marine safety, navigation, vessel repair and maintenance, health emergencies, and fishing gear technology. Courses include hands-on experience. Secondary and postsecondary programs are normally offered in or near coastal areas.

Experienced fishers may find short-term workshops offered through various postsecondary institutions especially useful. These programs provide a good working knowledge of electronic equipment used in navigation and communication, and the latest improvements in fishing gear.

Captains and mates on large fishing vessels of at least 200 gross tons must be licensed. Captains of sport fishing boats used for charter, regardless of size, must also be licensed. Crew members on certain fish processing vessels may need a merchant mariner's document. The U.S. Coast Guard issues these documents and licenses to individuals who meet the stipulated health, physical, and academic requirements. (For information about merchant marine occupations, see the statement on water transportation occupations elsewhere in the *Handbook*.)

Fishers must be in good health and possess physical strength. Good coordination, mechanical aptitude, and the ability to work under difficult or dangerous conditions are necessary to operate, maintain, and repair equipment and fishing gear. Fishers need stamina to work long hours at sea, often under difficult conditions. On large vessels, they must be able to work as members of a team. Fishers must be patient, yet always alert, to overcome the boredom of long watches, when not engaged in fishing operations. The ability to assume any deckhand's functions, on short notice, is important. As supervisors, mates must be able to assume all duties, including the captain's, when necessary. The captain must be highly experienced, mature, decisive, and possess the business skills needed to run business operations.

On fishing vessels, most fishers begin as deckhands. Deckhands who acquire experience and whose interests are in ship engineering—maintenance and repair of ship engines and equipment—can

eventually become licensed chief engineers on large commercial vessels, after meeting the Coast Guard's experience, physical, and academic requirements. Experienced, reliable deckhands who display supervisory qualities may become boatswains. Boatswains may, in turn, become second mates, first mates, and finally captains. Almost all captains become self-employed, and the overwhelming majority eventually own, or have an interest in, one or more fishing ships. Some may choose to run a sport or recreational fishing operation. When their seagoing days are over, experienced individuals may work in or, with the necessary capital, own stores selling fishing and marine equipment and supplies. Some captains may assume advisory or administrative positions in industry trade associations or government offices, such as harbor development commissions or in teaching positions in industry-sponsored workshops or educational institutions. Divers in fishing operations can enter commercial diving activity—for example, repairing ships or maintaining piers and marinas—usually after completion of a certified training program sponsored by an educational institution or industry association.

Job Outlook

Employment of fishers and fishing vessel operators is expected to decline through the year 2010. These occupations depend on the natural ability of fish stocks to replenish themselves through growth and reproduction, as well as on governmental regulation of fisheries. Many operations are currently at or beyond maximum sustainable yield, partially because of habitat destruction, and the number of workers who can earn an adequate income from fishing is expected to decline. Job openings will arise from the need to replace workers who retire or leave the occupation. Some fishers and fishing vessel operators leave the occupation because of the strenuous and hazardous nature of the job and the lack of steady, year-round income.

In many areas, particularly the North Atlantic and Pacific Northwest, damage to spawning grounds and excessive fishing have adversely affected the stock of fish and, consequently, the employment opportunities for fishers. In some areas, States have greatly reduced permits to fishers, to allow stocks of fish and shellfish to replenish themselves, idling many fishers. Other factors contributing to the projected decline in employment of fishers include the use of sophisticated electronic equipment for navigation, communication, and fish location; improvements in fishing gear, which have greatly increased the efficiency of fishing operations; and the use of highly automated floating processors, where the catch is processed aboard the vessel. Sport fishing boats will continue to provide some job opportunities.

Earnings

The majority of fishers earn between \$300 and \$750 per week. Earnings of fishers and fishing vessel operators normally are highest in the summer and fall—when demand for services peaks and environmental conditions are favorable—and lowest during the winter. Many full-time and most part-time workers supplement their income by working in other activities during the off-season. For example, fishers may work in seafood processing plants, establishments selling fishing and marine equipment, or in construction, or in a number of non-related, seasonal occupations.

Earnings of fishers vary widely, depending upon their position, ownership percentage of the vessel, size of ship, and the amount and value of the catch. The costs of the fishing operation—the physical aspects of operating the ship such as the fuel costs, repair and maintenance of gear and equipment, and the crew's supplies—are deducted from the sale of the catch. Net proceeds are distributed among the crew members in accordance with a prearranged

percentage. Generally, the ship's owner—usually its captain—receives half of the net proceeds. From this, the owner pays for depreciation, maintenance and repair, replacement and insurance costs of the ship and equipment; the money remaining is the owner's profit.

Related Occupations

Other occupations that involve outdoor work with fish and watercraft include water transportation occupations and fish and game wardens.

Sources of Additional Information

Names of postsecondary schools offering fishing and related marine educational programs are available from:

► Marine Technology Society, 1828 L St. NW., Suite 906, Washington, DC 20036-5104. Internet: <http://www.mtsociety.org>

Information on licensing of fishing vessel captains and mates, and requirements for merchant mariner documentation, is available from the U.S. Coast Guard Marine Inspection Office or Marine Safety Office in your State, or:

► Office of Compliance, Commandant (G-MOC-3) 2100 Second St. SW., Washington, DC 20593.

► Licensing and Evaluation Branch, National Maritime Center, 4200 Wilson Blvd., Suite 630, Arlington, VA 22203-1804.

Forest, Conservation, and Logging Workers

(O*NET 45-4011.00, 45-4021.00, 45-4022.01, 45-4023.00)

Significant Points

- Workers spend all their time outdoors, sometimes in poor weather and often in isolated areas.
- Most jobs are physically demanding and can be hazardous.
- A small decline is expected in overall employment.

Nature of the Work

The Nation's forests are a rich natural resource, providing beauty and tranquillity, varied recreational areas, and wood for commercial use. Managing forests and woodlands requires many different kinds of workers. Forest and conservation workers help develop, maintain, and protect these forests by growing and planting new tree seedlings, fighting insects and diseases that attack trees, and helping to control soil erosion. Timber cutting and logging workers harvest thousands of acres of forests each year for the timber that provides the raw material for countless consumer and industrial products.

Forest and conservation workers perform a variety of tasks to reforest and conserve timberlands and maintain forest facilities, such as roads and campsites. Some forest workers, called tree planters, use digging and planting tools called "dibble bars" and "hoedads" to plant tree seedlings to reforest timberland areas. Forest workers also remove diseased or undesirable trees with a powersaw or hand-saw and spray trees with insecticides to kill insects and to protect against disease and herbicides to reduce competing vegetation. Forest workers in private industry usually work for professional foresters and paint boundary lines, assist with prescribed burning, and aid in tree marking and measuring by keeping a tally of the trees examined and counted. Those who work for State and local governments or under contract to the Federal Government also clear