



UNIT I

A FISHING PRIMER





LESSON 1

THE EVOLUTION AND HISTORY OF FISHING



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LESSON 1

The Evolution and History of Fishing

Lesson Objectives

Following this lesson students will:

1. Understand why people fish.
2. Know the difference between subsistence, commercial and recreational fishing.
3. Understand both the social and economic importance of fishing.
4. Be aware of problems and conflicts in fishing.

Materials for the Lesson

- 1 Copies of the graphics to use as overhead transparencies or as photocopies for individual students.
- 2 A net or seine.
- 3 A fish spear.



TEACHING STRATEGY

Lesson Content Outline

I. Introduction

II. Why People Fish

- A. Subsistence
- B. Commercial or
- C. Recreational

Classroom Procedure

1. Introduce students to the objectives of the lesson.
2. Ask students why people fish. The three general categories of subsistence (food), commercial (food), and recreational (fun), will probably be expressed in some fashion.
3. Ask the students to define the difference among the three categories and to cite examples of each in your area. Since commercial fishing is not done everywhere, students in some areas may have to discuss examples they may have seen during vacation.
4. Explain to students that fishing began as a search for food, but has developed into a popular sport and leisure-time activity. Somewhere in the process of that evolution, commercial fishing was developed.
5. Using the handouts and overhead transparencies, discuss how primitive people caught fish by hand fishing, clubbing, nets, spears, gorges, and early hooks. Describe and explain some early types of fish traps. Ask students if they think it would be difficult to catch fish using these methods. Let them respond. Show the modern net and gig and explain that primitive nets made from vines, etc., were not nearly as effective as those available today.
6. Discuss how commercial fishing developed as humans began to subdivide tasks for the benefit of society as a whole and people specialized as food gatherers, farmers, etc. as societies advanced. Thus a few people would provide for a larger number and then barter or sell their products. Explain that this has now advanced into a very sophisticated industry. Use the overhead projector and transparency to show the modern commercial fishing boat and the commercial net. Explain how these work to catch the fresh and processed fish commonly found in fish markets, fish shops, supermarkets and grocery stores.
7. Note that most commercial fishing is practised in salt water. However, in fresh water, eels and carp are harvested under predator or pest control.

8. Discuss how aquaculture is one of the ways being developed to ensure a supply of seafood both now and in the future to relieve pressure on the wild stocks

9. Explain to the students that the majority of this fishing education course will emphasize recreational fishing, one of our most popular leisure and sporting activities. Depending on your location you will emphasize saltwater or freshwater fishing, or in certain areas, especially those areas bordering the ocean, a combination of the two types.

III. Social and Economic Impact of Fishing

- A. Commercial
- B. Recreational

10. Determine the primary types of fishing that students have done, the types of fish caught and, if they have fished from boats. Conduct a brief discussion on what they have most enjoyed, most disliked, and what they want to learn from the course.

11. Discuss the social and economic impact of both commercial and recreational fishing. Ask the students to name some direct ways this can be seen, such as specific jobs, businesses, and groups of people that have developed as a result of fish and fishing. List these on a chalkboard.

12. Explain that much more than fishing skills will be taught during the remaining sessions. Conservation and management, ethics, biology, ecology, and their individual role in preserving and enhancing our aquatic resources will be stressed. Discuss why these are important to them as individuals and to our society.

IV. Quality vs. Quantity in Recreational Fishing

- A. Quantity
- B. Quality
- C. Fisheries Goals

13. Ask students to define quantity and quality in recreational fishing. Generally, quantity refers to numbers of small fish, quality refers to large fish. Philosophies differ on which is best; a few large fish to catch or lots of smaller or average-sized fish. Perhaps a good solution in many areas is the availability of a lot of fish with some of them being large to add some "special" excitement to fishing. Much depends on what the public demands in a body of water or area. The role of fisheries' management is to provide a proper and effective balance. Ask the students what they would like; to catch a lot of smaller fish or a few large ones. What is their role in this activity? This could be an appropriate time to introduce the concept of "catch and release" that is widely practised and what effect it can have on the resource.

INTRODUCTION

This lesson will help the students become aware of the reasons for interest in recreational fishing, the importance of fishing as a commercial endeavour, and the problems and conflicts that arise between recreational and commercial fishermen and between recreational fishermen of differing interests.

The differences between commercial, subsistence and recreational fishing methods will also show how and why some are regarded as "sporting" while other methods, better suited to taking more or larger fish, are not as well regarded as suitable for general recreational and sport fishing. This lesson also will stimulate thinking about aquatic resources that will be considered in later lessons on fisheries management, fisheries conservation and fishing ethics/personal commitment.

NARRATIVE

General

Early man lived as a hunter. The term "hunter" in its broadest sense differentiates from later periods of early man during which he became a farmer, growing crops and harvesting food for both immediate and long-term needs.

Subsistence fishing is a form of hunting, as is hunting for animals for food and clothing, or hunting for roots and berries for food. Utilizing the waterways to hunt for and gather fish for food was an extension of mankind's early needs and methods of survival.

As mankind began to subdivide tasks for the benefit of society as a whole, and as survival tasks became easier and more productive, some members of a clan or tribe specialized in gathering food. Hunting for food included fishing on a scale large enough to feed the entire social class or order. This was the forerunner of commercial fishing today in which a relatively few fishermen gather large quantities of fish by netting, dredging or hooking to feed many people who perform other tasks.

Recreational fishing is completely different since it is a leisure or sporting activity; one of the few - along with falconry, hunting and riding - that was established in medieval times. Recreational fishing is fishing for enjoyment as perceived by the individual. Recreational fishing can include the capture of fish for food, the challenge of catching the fish, the enjoyment of being on the water, the companionship of others involved in fishing, the appreciation of being outdoors and the enjoyment of related hobbies, such as fly tying, rod making and taxidermy.

Why People Fish - Subsistence Fishing

The reason for subsistence fishing is very simple. People must have food and fish taste good, are nutritious and often easy to obtain. For early man, subsistence fishing was an extension of his basic hunting survival method. Today, subsistence fishing has declined in most countries due to increases in human populations, loss of fish habitat and competition for fish.

It is important economically because it supplements limited cash incomes. Subsistence is also important because the activities of harvesting, processing, storing and consuming fish connect people socially and link them to their cultural heritage. In most areas where subsistence fishing continues, strong traditions govern how fish are captured and used. Generally, waste is prohibited and if someone catches more than he needs, he shares the fish with relatives or neighbours.

Nets are, and were, perhaps the most basic way to get fish for food. Early nets were made of vines, roots, grass, animal sinews and flax, while modern ones are constructed of braided nylon and monofilament line. Nets allow the capture of large numbers of fish as follows:

- (1) by enclosing a certain area of a body of water and gradually decreasing the enclosed area to concentrate and harvest the fish;

- (2) by netting across a river to ensnare fish (as with gill nets) as they migrate or make spawning runs; or
- (3) by trapping and channeling fish into holding pens or corrals for capture and use.

Once very common, fish traps were like holding pens or nets, into which fish swam or were run for capture by waiting fishermen. Fish traps could be made of piles of stones or stakes to channel fish and water, or a combination of stakes, stone piles and netting. These traps were usually built in the shallow offshore waters or along the side of streams where they were used to channel fish into the shore or holding pens, or to places in the shallows of beaches, bays and rivers. In rivers, traps were used to concentrate and capture fish making up or downstream runs and migrations. Fish traps are seldom used today due to the cost of construction compared to more effective, modern methods of catching. Likewise, harpoons and spears consisting of single (harpoon) or multiple barbed spears, have been used for subsistence fishing. The barbs prevent the fish from sliding off the spear and being lost. Many types of harpoons and spears have been used, with most having been designed for shallow water fishing by primitive groups wading, or fishing from small boats and canoes. Such harpoon and spear heads were made of bone, fire hardened wood or stone.

Hooks and gorges made of animal and fish bones, shells, gourds, chipped stone and wood have been used for thousands of years for subsistence fishing. Gorges were straight lengths of wood, usually no more than several inches long, with a groove in the middle for tying the fishing line. When bait was attached and swallowed, the gorge would turn in the fish's body and could not be dislodged, making it possible to land the fish.

Hooks of the past were almost identical in shape and principle to those used today. They had the same typical hook shape; a sharp pointed end, a barb, and, in some cases (particularly with the hooks of the Bronze Age), with an eye

for attaching the line. While these hooks were similar to the sport fishing hooks used today, they were designed for subsistence fishing.

Why People Fish - Commercial Fishing

Commercial fishing is fishing for large quantities of fish to be sold. Commercial fishing is a necessity in modern life. Without it, many people would not be able to eat fish. Commercial fishing provides estuarine, reef and offshore food species. It is a job, just like banking, running a grocery store or working as a salesman for a large company. Commercial fishing usually requires a large outlay of money for equipment such as boats, netting, dredges and operating expenses. The results are always risky since the amount of fish harvested, and thus income or profit made, is dependent upon weather conditions, market prices, competition from other commercial fishermen, seasonal conditions, fisheries populations and fish availability.

Long lines are also used to capture offshore species such as tuna. Some countries also use them to catch billfish (marlin and sailfish). Long lines consist of a main long line, up to several miles or more, from which run short lines, each ending with a hook and bait or lure. Large floats mark the ends of the short lines. A boat travels the line, gathering the caught fish and re-baiting the hooks.

Deepwater and reef species such as trevalla, cod, snapper, coral trout and gemfish are taken by hook and line or deepwater trawl nets. Inshore species including flounder, flathead, whiting, bream, mullet, tailor and similar smaller species are taken by net. Saltwater commercial fishermen also supply the consumer with shellfish, such as crabs, scallops, lobster and prawns.

Commercial fishing is also practised in fresh water. Carp are taken for processing as pet food or fertilizer. Eels have been taken as a form of predator control. Most fresh water commercial fishing is really fish farming (Aquaculture). The "fishermen" buy land, construct ponds or waterways and stock species to raise and later sell, just as a beef cattle producer buys land,

raises cattle and sells them for a profit. Species produced in this manner include rainbow trout and silver perch and freshwater crayfish. In the North of the State increasing development of saltwater aquaculture produces barramundi, prawns and other tropical species. Another widely practised form of saltwater commercial farming is oyster farming.

Other types of commercial fishing gear include ring nets, tunnel nets, gill nets (either floating "drift nets" or anchored and designed to snare fish by the gills), haul seines (designed to be pulled to shore with fish), fish traps and crab pots.

Why People Fish - Recreational Fishing

Recreational fishing is fishing for enjoyment. The definition varies widely, thus interest occurs in many different forms of recreational fishing. It is not fishing for subsistence, even though the catch is often eaten, since such catches, while important to many anglers, are not required to sustain life. It is not commercial fishing for which the angler will be paid for his catch.

Recreational fishing methods vary widely. They include everything from fishing with a handline and simple hook, bait, and sinker for bottom feeders, to sophisticated and often expensive methods such as offshore trolling, reef fishing and fly-fishing. Some anglers have fun just by being outdoors and often combine fishing with boating, picnicking, camping, and backpacking. Some anglers enjoy the solitude possible by "getting away from it all". Others like the companionship possible with certain types of fishing such as charter boat, party boat, pier or jetty fishing where many anglers are present. Other anglers like to catch fish for the fun of getting something different to eat. Many like to fish with certain gear or in certain ways, such as fly fishing, fishing only with artificial lures, trolling, surf fishing, or fishing with light tackle. Still others fish to establish records for the International Game Fish Association (IGFA), Game Fishing Association of Australia (GFAA) or Australian National Sportfishing Association (ANSA) line classes.

Others like to participate in tournaments run by the fishing organizations or the commercially run competitions. Many anglers use fishing as a hobby that can be enjoyed throughout life. They may become further engrossed with the side aspects such as fly tying, rod building, taxidermy, lure making, boating, and entomology (the study of insects for fly fishermen). It is important to remember that fishing can be different things to different people and still provide immense enjoyment. It can be contemplative or intellectually stimulating, relaxing or physically demanding, simple or complex, inexpensive or extremely expensive, practised from shore or from a boat, enjoyed by one of almost any age, constantly or infrequently, and practised almost without concern for season, weather, time or temperature. However, the primary goal of all of these people is to catch a fish.

Social and Economic Impact of Fishing - Commercial Fishing

Commercial fishing is not primarily a social activity. It is a job and is done as an income producer. This does not mean that it is not enjoyable or that there are no social interactions on the job, only that commercial fishing is not done primarily for enjoyment. There is, however, a great impact on the population as a whole. Commercial fishing allows food stores throughout the country to stock fresh, frozen, dried, smoked, canned and salted fish of many species. This benefits society by providing variety in the diet, healthful food and delicious meals that otherwise would be impossible for many to obtain. Even recreational fishermen would normally be restricted to consuming a few local species of their own seeking were it not for commercial fishing endeavours.

The economic impact is also important. Commercial fishing provides employment for fishing boat workers, boat captains, fish farmers, cannery workers, boat owners, fish processing plants, shipping and trucking industries, food wholesalers, food stores and restaurants. There is also a "ripple

effect", as with any industry, which benefits a number of other industries including food, housing, clothing, vehicle, fuel and convenience store sales. In the past, entire coastal towns have been built around and prospered as a result of commercial fishing.

Social and Economic Impact of Fishing - Recreational Fishing

Recreational fishing can offer a high degree of social interaction. An example is a fishing class, where students and instructor(s) are gathered together to learn more about fishing, fish and the marine and aquatic environments. The degree of social impact can and will vary with the angler. Some anglers consider fishing a pursuit to be best enjoyed while alone, away from all possible signs of civilization and other people. Usually, they are in the minority as most anglers enjoy the social aspects of recreational fishing.

This interaction can take many forms. Many anglers fish, and gather together to discuss fishing with family members and close friends. Others are involved in a neighbourhood or area fishing community, exchanging tips, information and occasionally fishing together. Some join or start fishing clubs. Such clubs are local although they may be affiliated with larger national organizations. Groups such as the Game Fishing Association of Australia (GFAA), the Australian National Sportfishing Association (ANSA), the Australian Amateur Anglers (AAA), the Freshwater Fishermen's Assembly (FFA) or the Freshwater Fish Stocking Association of Queensland (FFSAQ) are among a number of large national or state groups.

Usually these groups have a common interest in a species, a method of fishing or a geographical area. The individual must make of the practiced method of fishing what he/she will and determine an appropriate level of involvement. The social activities of an active fishing club can be extensive. Fishing trips, club tournaments, monthly meetings, seminars, youth instruction, legislative lobbying for recreational fishing goals, picnics, conservation efforts, stream improvements, fish rearing, fish

stocking, and fund raising activities can be as extensive as that of any other club or interest in Australian life.

While the economic impact of recreational fishing is seldom realized, it has tremendous importance and can be measured through licence sales, angler surveys, questionnaire surveys and similar means. The economic importance, when accurately measured for some species, has been found to surpass that of the commercial impact for the same species. Part of this is due to expenditures for rods, reels, line, lures, hooks, bait, boats, motors, electronics, launch fees and slip fees, as well as expenses incurred traveling to the fishing site for fuel, hotels and food.

Recreational fishing is also important for the "ripple" economic effect felt throughout a community. Expenditures for fuels, lodging, meals, convenience stores, restaurants, tackle, clothing, camping areas and boat rentals are quite large. In addition, the ripple effect throughout the community, region or state as those anglers' dollars circulate, aid secondary suppliers and manufacturers of the goods and services used by recreational anglers. Some communities have purposely capitalized on fishing interest or have sponsored fishing tournaments, for their economic impact and value to the business community. The value of recreational fishing to Queensland is quite large. The number of recreational fishers over the age of 5 years who fished in Queensland during the year 1996/97 was approximately 882,000 and in 1998/99 approximately 840,000. This was based on the information from the 1st and 2nd RECFISH Telephone Surveys, conducted by Queensland Fisheries Management Authority (QFMA) in 1996 & 1998. The estimated value to Queensland's economy from recreational fishing is about \$904 million and it generates employment equivalent to about 30,000 full time jobs (from calculations based on the publication "Economic Impact of Recreational Fishing in Victoria" released in August 1997).

By comparison, commercial fishing figures for 1998/99 show the number of

primary commercial fishing boat licences held in Queensland was 1955 (based on the QFMA Annual Report 1998/99). For the year 1996/97 the GDP for commercial fishing was \$196.5 million (based on the information from the DPI publication "Queensland Commercial Fishing Fleet Licence Packages 1996/97")

Quality vs. Quantity in Recreational Fishing

Since recreational fishing can encompass many different philosophies, ideas, degrees of interest and concepts of enjoyment, there are also widely varying ideas regarding the use of the catch. On one hand are those who would like to catch as many fish as possible for food or for "show and tell." Other anglers release every fish they catch, with their pleasure coming from their ability to catch the fish. The philosophy of "Catch and Release" began with trout and bass fishing, later extended to game and sport fishing, but today has become more widespread to include many salt water fishing tournaments. Many tournaments are now tag and release only.

The merits of the quality versus quantity of the catch are often discussed. Whether wild or stocked, fish caught in large quantities are usually of small or average size. Where only a few fish are caught, they are usually quality or larger fish. Considering that only a few fish live to become large or trophy size fish, quantity catches of smaller fish usually are more common than catches of large fish. As a result, most fish are harvested before they reach a quality size. Fish management can control the harvest to a degree with the imposition of bag or size limits.

In some cases, quantity and quality is not a problem. Species such as tailor, bream, whiting, dart, and stocked bass will rarely gain sizes disproportionate to that of the rest of a school or area. There are exceptions, such as the few trophy trout with smaller rainbow trout in some trout streams, and the occasional trophy bass or barramundi in with many smaller catchable fish of that species. In these situations, size as a measure of quality is

not a problem since few anglers are searching for a trophy bream, whiting or dart. Often these are the species that are most popular for food, so a trophy is a less important goal than catching enough fish for a good meal.

Therefore, a role of fisheries managers can be to adjust a population of fish to meet the demands of the recreational fishing public. Consistent with costs, biological parameters and reasonable planning, the goal is to give the public a proper and effective balance of quality fishing and quantity catches.

Summary

Fishing has had a long history beginning with subsistence fishing. Commercial fishing is still important economically and for the food available as a result. Recreational fishing has gained tremendous popularity and today far surpasses commercial fishing in direct economic importance.

An appreciation of recreational fishing involves not only an understanding of its history and the various types of tackle used in recreational fishing but also a knowledge of the relationship between quality versus quantity fishing and the influences that lead to the enjoyment of fishing.



LESSON 2

HOW TO CATCH A FISH



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How to Catch a Fish

Lesson Objectives

Following this lesson students will:

1. Recognize species of fish that are popular to catch and to eat.
2. Understand basic fish migrations and movements and why these occur.
3. Understand basic methods of catching fish.
4. Be able to identify basic equipment including hooks, sinkers, floats and line.
5. Understand how water quality and fish biology affect the species available in certain types of water.
6. Recognize common baits, how to use them and where to find them.

Materials for the Lesson

If possible, each student should be provided with:

1. 100 metres of monofilament line, about 5kg test,
2. One plastic float 25 – 50 mm diameter (freshwater),
3. Earthworms and/or minnows (freshwater) or yabbies, prawns and/or baitfish (saltwater) - 1 or 2 per student,
4. Several hooks size 1-6, with a regular shank length,
5. Several ball sinkers, size 0 to 2,
6. Several swivels, size 8 to 10, and
7. Clothesline rope 2 metres per student.

Other Materials

1. Photocopies of the graphics in the appendix and overhead transparencies for instructor's use. Also useful are examples or pictures of several locally popular fish and the graphic showing the blood and locked blood knot.
2. Spinning or side cast outfits - 1 per student
3. Casting practice plugs, 10g and 15g

TEACHING STRATEGY

Lesson Content Outline

Classroom Procedure

I. Introduction

1. Introduce students to the lesson objectives.

II. Where Fish Live

- A. Freshwater
- B. Saltwater
- C. Brackish
- D. Other Considerations

2. Discuss fresh, salt, and brackish water and the species of fish that live in each. Concentrate on those that are popular in your area. Use photocopies and overhead transparencies of these fish during the discussion.

3. Discuss how seasons, water temperature, currents and Oxygen levels affect what types of fish will live in certain bodies of water and that it is important to know about these to increase angling success. Relate that different species have different requirements of water quality and temperature along with the other factors that have a tremendous influence on the fish available.

III. Types of Fish

- A. Freshwater
 - 1. Cold Water
 - 2. Warm Water
 - 3. Tropical
- B. Salt Water
- C. Anadromous or Catadromous

4. Explain that freshwater fish are generally considered to be either cold or warm water fish. Trout and salmon are cold water species. Bass, catfish, yellowbelly, murray cod, and silver perch can be considered warm water fish. Sooty grunter, barramundi, and saratoga are considered tropical. Some saltwater fish ascend streams or rivers to spawn and are called anadromous species. Some fish descend streams or rivers to spawn in salt water and are called catadromous. However, their juveniles live in fresh water.

IV. Simple Tackle and Equipment

- A. Hooks
- B. Sinkers
- C. Floats
- D. Swivels
- E. Lines
- F. Rod/Reel Substitutes
- Hand Line
- Tin Can

5. Discuss fishing tackle needed to catch fish. Distribute the line, floats, hooks, sinkers, and rope to the students. Using the overhead transparency and a piece of rope to demonstrate, teach the students to tie a locked blood knot. After practising with the rope, have each student take a length of monofilament line and a hook and practise tying the line directly to the hook.

6. Again, use the overhead transparency to show the various rigs for fishing. Have each student prepare a rig with a hook, a ball sinker and swivel on a 2 metre line. Show a similar rig on a sidecast and also on a spinning outfit.

V. Bait

- A. Worms
- B. Small Baitfish
- C. Insects
- D. Prawns, Yabbies and Crabs
- E. Prepared Baits

7. Ask students what else, if anything, they need for fishing. The obvious answer is bait. Use the overhead transparencies and photocopies to show common baits for bait fishing, and how they are attached to the hook. Distribute the various baits to students and have them bait a hook. Expect some of them to be reluctant. They can compare their efforts to the transparency or photocopy. After they all have successfully completed this activity have them clean their hook and place the bait in a waste basket.

**V. Easy Methods of
Catching Fish**

- A. Bait Fishing
- B. Casting
- C. Trolling

8. Ask students how the bait is placed where a fish can eat it. Bait fishing, casting and trolling may all be mentioned. Explain that still fishing will be emphasized. Demonstrate how to use both the spinning and sidecase outfit, to place the baited hook where it can be taken by a fish. Stress the importance of safety and the difficulty of placing the baited hook with a float, on the line.

9. Move the class outdoors or into a gym where swinging the bait can be practised for a few minutes. Again demonstrate the equipment to the students so that while you attempt casting the bait, the students can watch. A hand line can also be used for this exercise with the excess line coiled on a hand caster, can, bottle or a small packet. Keep students widely separated to minimize the chance of an accident and use casting plugs on the lines rather than hooks. Baitcaster outfits can also be demonstrated and used in this activity. You may wish to review lesson 8.



INTRODUCTION

This lesson will provide the necessary background for students to catch a fish. While a discussion of hooks, bait, line, floats, swivels and sinkers is advisable before beginning, much of this lesson will be devoted to fishing. Since most of the lessons are designed for 45 to 60 minutes duration, this lesson may be planned in two parts. First, have a class meeting and discussion to accomplish the lesson objectives. Near the end of the lesson, plan for a fishing outing before the next lesson is presented. It is important to emphasize that fish live in virtually any body of clean water, that clean, pure water is invaluable for all of us and, that most anglers can find fishing of some type near home.

Where Fish Live

Fish can be found nearly everywhere there is water of sufficient quality. Types of fish vary with the water quality. For example, carp have lower requirements for water quality, oxygen and food than bass. Nearly everyone can find fishing within a short distance of home. Fish populations are limited, so one must be careful to catch and keep only those fish that will be used for food. Fish can be released without injury and this will also help provide fish for future fishing trips. Fishing regulations are designed to keep fish populations from being depleted and to spread the resource among anglers for years to come.

Freshwater Fish

Freshwater fish inhabit streams, rivers, and still water such as dams, billabongs, lakes, ponds, quarries and gravel pits. The type of water will usually determine the species of fish one can catch there. Lakes, dams, billabongs and ponds are typically the home for tarpon, catfish, yellowbelly, saratoga, barramundi, bass, trout, carp, tilapia and other species. Rivers produce and hold fish that can live in currents, but much overlapping with still water species occurs. Many

Australian freshwater fish are stream fish and are stocked into the impoundments.

Saltwater Species

Saltwater species also vary, depending upon where they are located. Pelagic fish are free to roam in deep water, often following defined ocean currents like the East Australian Current (flowing down the east coast), the Leeuwin Current (flowing from the north off Western Australia), and the Humboldt current (located in the Pacific off South America). These currents control the movements of fish such as marlin, dolphin (the fish - not the mammal), wahoo, sailfish, tailor, mackerel and sharks.

Demersal species living inshore on reefs including sweetlip, emperor, snapper, jobfish, cod and coral trout tend to have limited movement in open ocean water. Inshore species depend upon protected bays and estuaries and have very limited movement in open ocean water. They do have migratory movements that vary greatly by the species. Some migrate only a few kilometres while others such as mullet may migrate inshore along much of a coastline. In most cases, migrations occur primarily during spawning and fluctuating (summer-winter) water temperatures.

Brackish Water

Many species can be found along the coast in the mix of fresh and salt water, often called brackish water. Brackish water contains salt but is diluted by freshwater entering from rivers and streams along the coast. As a result, in "river mouth" areas the quantities and quality of fish and of fishing can fluctuate with salinity levels. Salinity levels fluctuate daily with the flow of tides and degree of rain or freshwater entering the system. The more rain and freshwater, the more dilution, thus lower salinity levels. Alternately, less rain and

freshwater, less dilution and thus higher salinity levels. Species that live in brackish water will vary by geographic area. They include bass, bream, tarpon, catfish, mullet, mangrove jack and barramundi.

Other Considerations

Other considerations in finding fish are the seasons and water temperature. Lakes and ponds are termed cold water, or warm water lakes by fisheries biologists. Cold water lakes typically are more prevalent in the southern half of the country and contain species such as trout and salmon. Warm water lakes hold species such as bass, carp, catfish, yellowbelly, murray cod and silver perch and in the tropics sooty grunter, saratoga and barramundi.

Seasons also determine the movement of fish. Many fresh and saltwater species such as bass and barramundi migrate based on spawning habits. Dams on many rivers interfere with these migrations and the areas above the dams must be stocked to maintain populations of fish. Some fish follow temperature gradients in large bodies of water that stratify (develop layers of different temperature and oxygen levels) during the summer months. Many saltwater species also follow seasonally changing temperatures in ocean currents such as the East Australia Current.

Types of Fish

Fish that can be caught by hook and line are common everywhere. They include popular species in freshwater such as bass, sooty grunter and yellowbelly along with species such as carp and catfish that are less famed but equally provide as much fun. In saltwater there are bream, whiting, flathead, tailor, trevally and barramundi along with species such as sharks, rays and catfish that are less popular but also provide as much fun.

Fish have certain requirements to live, one of these being a specific range of water temperature. These include the trout and salmon as cold water fish, with the bass, yellowbelly, silver perch,

murray cod, carp and catfish as warm water fish and, with barramundi, saratoga and sooty grunter as tropical.

In addition, most saltwater species will follow specific temperature gradients, which explains the influx of certain species during certain times of the year along coastal areas. In many cases these fish are following saltwater currents which do change seasonally, such as the East Australia Current.

Some fish live in saltwater but ascend streams and rivers to spawn. These fish are called anadromous, which means that they are freshwater spawning. These include certain salmon and trout. Some fish live in freshwater but descend streams and rivers to spawn in salt or brackish water. These fish are called catadromous, which means that they are saltwater spawning. These include bass and barramundi.

Simple Equipment

To catch fish requires only basic equipment. However, many fishermen ultimately obtain extensive equipment (discussed in later lessons) but simple items are often adequate to catch fish. An angler can have as much fun fishing for small fish with a hand line, hook, sinker, and float as with more extensive equipment.

With any equipment, it is necessary to get the bait to the fish. One can begin simply with cane poles and flexible willow branches as “Ned Kelly” rigs, although some students may well have more sophisticated tackle.

When working with students who lack tackle, they can use handlines that can be coiled and thrown into the water using a sinker for weight, or a line can be tossed from a bottle used as a rudimentary handcaster. A tin can or large round box will also work.

Bait

To catch any fish, a bait or lure is needed. Bait can be anything that the fish will accept as food, placed on the hook. Typical baits include worms. Garden worms are fine for nearly all

freshwater fish. To find worms, dig in any rich garden area or better still, turn over boards, bricks, logs, or other objects, as worms will often be located underneath. Special sea worms are often used in salt water.

While the hooking methods are the same for sea worms and earth worms, sea worms cannot be collected as easily as earth worms. Some are caught using your fingers in the surf and others are dug from the mud or sand in bays and estuaries.

There are several ways to hook worms. If the worms are small, the best way is to thread the hook through the sides at several points along the body. For bait stealing fish, thread a short piece of worm until the hook is completely covered.

Rigging Bait

For a simple rig, cut a section of about 40cm of line from the line on the reel. Tie the hook to one end of the piece of line and tie a small swivel to the other end, each time using a locked blood knot. Thread a small ball sinker on to the main line and tie the end of the main line to the other end of the swivel. This is a basic rig for most types of fishing. The hook size depends on the bait being used and the target fish.

Baitfish

Fresh or frozen baitfish can be purchased from bait shops, but to get live bait fish you will have to catch your own using a bait jig, bait trap, scoop net, cast net or bait net. Always check local regulations as netting or trapping may not be legal in some areas. For long life, baitfish must be kept cool in a special live bait bucket or trap. Do not overcrowd baitfish in a small container. An aerator to re-supply oxygen, or a re-circulating pump to replace the water continuously, further helps to prolong the life of live bait.

To hook, the best method is through both lips, running the hook up through the bottom lip. This will work well for trolling, casting, and still fishing. Other methods are hooking through the tail or through the back, avoiding the spinal

cord. Dead whole baitfish can be mounted on ganged hooks and moved through the water to imitate live bait.

Insects

Both terrestrial and aquatic insects can be used. Crickets, cicadas, grasshoppers, christmas beetles and large moths are all traditional baits in freshwater. Often land insects such as these can be caught with a large scoop net. Dragon fly larvae (Mudeyes) can be scooped from amongst the vegetation growing at the edge of the water. Other larvae such as grubs or maggots can also be used. When using insects, get thin small hooks to avoid damaging the insect too greatly when you pass the hook through the insect's body. To get longer use out of each insect, take light copper wire, and wire the unharmed insect to the hook shank.

Other Baits

Some baits are regional and quite effective. Wood grubs are used in the western streams for yellowbelly and murray cod. In salt water areas, strips of squid and cut fish such as herring and pieces of eel are good baits. Shellfish, in both fresh (found in many rivers) and salt water are ideal when carefully threaded on a hook. Pieces of crab are commonly used along the coast and pieces of peeled prawn tail are also excellent. Certain types of sea vegetation are used to catch luderick.

Prepared Bait

Dough balls can be used for carp and other bottom feeders. Bread is commonly used to catch mullet, small squares of cheese dough for bream and canned corn is also good. In most cases, these prepared baits are hooked so that they cover the hook.

Easy Methods of Catching Fish

Several types of rigs can be used for fishing, including the following:

1. Float Rig. This consists of a hook tied to the end of the line with a small sinker 30 cm above it and a float 1 to 1.5 metres above that. It is ideal for holding a bait just below the surface to mid depths for small schooling fish to find.
2. Bottom Rig. This is the same as above with the exception that the float is removed. The bait lies on the bottom where bottom feeders can find it.
3. Bottom Rig (Variation One), is also fished on the bottom, but differs in that the sinker is tied to the end of the line and a short piece of line (trace or leader) is tied 45 cm above the sinker with the hook tied to the end of the trace/leader. This trace/leader is usually about 30 cm long. This type of rig, when fished straight down, as in still fishing, prevents the bait from lying completely on the bottom where fish might miss it.
4. Bottom Rig (Variation Two). This is just like the above, with the addition of a second leader and hook about 45 cm above the first, to double the chances of hooking a fish.

5. Drift Rig. If the bait is heavy enough to throw, swing or cast, it can be used to drift in the water without any float or sinker. This is best when fishing where there is a slow moving current, tide or water flow.

Note. All of the above can be used with a hand line dropped from a shore based point, a boat, or swung out with a long pole to place the bait away from the bank or fishing base.

When using handlines, the angler can accomplish a casting distance by swinging the bait/sinker around and releasing it in a timely fashion out towards the water. With practice, which should be conducted with young students before giving them the hooks, considerable distance can be obtained.

Trolling, while usually not applicable here, involves a moving boat. In this case, lures and baits, such as pilchards, are trailed over the stern of the boat to attract fish. Only a few lines can be used this way from most boats, and a very slow speed is necessary. Sinkers are usually needed to get the bait down to the fish. Trolling is not recommended at this time unless the class is very small, several boats are available, and conditions warrant this type of fishing.

Remember, the single most important result of this lesson must be to help students catch a fish, or several fish, to generate the enthusiasm for continuing the course and to learn in far greater detail all about fish, aquatic resources, conservation, ethics, tackle and fishing methods



LESSON 3

AQUATIC COMMUNITIES ---- WHERE TO FISH



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LESSON 3

Aquatic Communities - Where to Fish

Lesson Objectives

Following this lesson students will:

1. Know how aquatic habitats differ from each other,
2. Be familiar with different types of lakes and streams, estuaries, beaches and offshore habitats,
3. Know how the type of water determines the aquatic community,
4. Be able to identify the species that are most common in each type of water,
5. Understand why each species lives in a specific habitat,
6. Know how to approach and analyze fishing waters,
7. Be able to fish different waters with some degree of success.

Materials for the Lesson

1. Photocopies and overhead transparencies produced from the graphics on the dynamics of a stream, an estuary, a beach and an offshore reef
2. Use of other graphics as desired.



TEACHING STRATEGY

Lesson Content Outline

I. Streams and Rivers

- A. Characteristics
- B. Species Present
- C. How to Read the Water
- D. How to Fish

II. Lakes and Dams

- A. Characteristics
- B. Species Present
- C. How to Read the Water
- D. How to Fish

III. Estuaries and Bays

- A. Characteristics
- B. Species Present
- C. How to Read the Water
- D. How to Fish

Classroom Procedure

Based upon your geographic location, you may wish to teach all, or just the most pertinent sections of this lesson. Also, you may wish to invite an outstanding local angler to discuss fishing in local bodies of water, what species are present, and successful angling techniques. You may also wish to view the lesson plan for Lesson 23 for additional suggestions.

1. Introduce the class to the lesson objectives.
2. Discuss the different types of aquatic communities described in this lesson. Mention that there are obvious differences in these major categories, but that there are also differences within each category, based on their latitude, or elevation, depth, shape, and water quality. These factors determine the kinds of fish present, and their distribution. Additional factors in moving waters (streams and rivers), are the gradient, temperature, and substrate. Indicate that these factors will be discussed, and that understanding them is a major factor in successful angling.

3. Spend the majority of the class time focusing on types of waters in the local area. For each type, follow the lesson outline and discuss its characteristics, the species present, and why, how to approach and analyze water, and specific angling techniques.

4. Explain the basics of stream dynamics and how flowing water differs from stationary water. Discuss how the same stream or river can have fast and slow water, depending on the gradient and the tidal range.

5. Compare lakes and dams to nearby streams and rivers, explaining that both often hold the same species of fish. Discuss the factors that cause this to be true.

6. Talk about estuaries and how productive they can be. It is easier to show the features of a smaller estuary than a larger one. Stress the fact that every body of water must be broken down into workable sections from an angling standpoint.

7. Wetlands are often thought of as waste lands. Stress that they are among the most productive ecosystems on earth. Discuss their importance.

8. Focus on the importance of an estuary as a mixing zone where fresh and salt water meet. Discuss how fragile this area can be and how important it is to the survival of many species.

IV. Beaches

- A. Characteristics
- B. Species Present
- C. How to Read the Water
- D. How to Fish

9. Talk about beaches, how nothing is permanent and the fish constantly move but can be found associated with the same features wherever they occur. Stress the fact that every beach must be broken down into workable sections from an angling viewpoint.

V. Oceans

- A. Characteristics
- B. Species Present
- C. How to Read the Water
- D. How to Fish

10. Oceans cover three-quarters of the earth's surface. Dispel the myth that they are a well of unlimited fishery resources. Stress that they are fragile and that temperature and structure are the main factors in determining the species in any given location.

11. Make certain that students understand why certain species favour specific types of water and that water temperature is the primary factor determining what species will be there.

12. Determine that students understand the basics of finding the best spots, know how to approach fish quietly, and know why a bait or lure should be presented in a realistic and natural manner.



INTRODUCTION

To catch fish the angler must first locate them, determine an approach, and then select appropriate fishing methods. When fishing is done in this manner, the results often prove successful. Finding fish is often a difficult activity. Regardless of the type of water in which they live, fish have specific requirements for survival that include good water quality with adequate oxygen, tolerable temperature and adequate food and cover. If one of these factors is eliminated fish cannot remain very long.

All water does not contain fish, so the angler must learn to identify areas that might have fish. This takes time and practice but is the key to successful angling. Each species prefers a certain habitat. Understanding the relationship between habitat and fish habits and recognizing where the habitat exists help the angler experience success.

Nothing in nature is static. Water conditions and characteristics change constantly. A swiftly flowing creek may slow significantly during the summer months with a drop in water level. Stratification in lakes reduces oxygen near the bottom of deeper water. Catadromous species migrate from fresh water to salt water to spawn and seasonal migrations affect where fish will be and when. As a result fish must continuously adjust to such environmental changes. Therefore the angler who learns these patterns is better equipped to locate fish at any time of year.

NARRATIVE

Rivers, Creeks and Streams

Rivers, creeks and streams can be a trickling brook, a fast moving stream or a meandering creek or river. Generally as any stream becomes wider and deeper, it is called a creek or river. However, it is difficult to find a definition that denotes the exact requirements for this change in nomenclature.

Characteristics

There are three factors critical to moving water in terms of the type of aquatic community it supports: maximum water temperature, minimum water temperature, and substrate.

Gradient is the rate of fall expressed in metres per kilometre. This determines the speed of the water flow. Within a single stream, the gradient can change several times and will be reflected by the velocity of flow. As a rule, water volume increases as the stream moves away from its source. Volume is measured in cubic metres or kilolitres of water flowing past a specific point in one second. The faster a stream flows and the more it tumbles over rocks and obstructions, the greater the oxygen content.

Maximum summer and minimum winter water temperature is a key factor in determining the fish species a stream or river can support. Streams are classified as cold or warm water, although the same river may be cold in one section and warm in another. Salmonids such as trout require much colder temperatures than species such as bass and barramundi, which require warmer water temperatures.

Streams carry solid materials toward the mouth of the waterway. Some rivers are muddy or off colour because of fine clay sediment which remains suspended for a lengthy period. Others may contain large amounts of sediment from heavy rains and the resulting runoff. The substrates or bottoms of streams vary from place to place, ranging from stones and rock to mud and sand. Water quality coupled with the substrate determines the insect life that can survive. These aquatic insects are a vital part of the food chain.

Another classification of streams used by some anglers separates perennial streams from intermittent streams. Perennial streams usually occur in higher rainfall areas or are spring-fed with a relatively, constant oxygen content throughout the

year. Intermittent streams that dry to a string of waterholes have a much greater range of oxygen and temperatures.

Species Present.

Bass require clear water and relatively high levels of oxygen to survive. This becomes particularly critical during mid-summer and early autumn when water temperatures rise, water levels drop and oxygen may be less plentiful.

Carp and tilapia are far more tolerant of low quality water conditions and so thrive where the conditions are adverse to more valued species. Consequently, unless the minimum winter temperatures are tolerable for barramundi at that time of year, they simply cannot live there.

Insects and shrimp are a mainstay of a fish's diet. Those streams with a substrate that supports strong insect life and plenty of shrimp should hold more and larger fish. Food choices may vary, but these are vital links in the food chain.

On the eastern coast, rivers that are otherwise too cool for barramundi and sooty grunter frequently prove ideal for bass. Yellowbelly, murray cod and silver perch are capable of handling the greater range of conditions in the western streams.

Creeks and rivers often host the same species found in nearby lakes and ponds. This is because Australia's native stream dwelling fish easily take up residence in the river below the dams from which they have escaped. Catadromous species such as bass, jungle perch and barramundi use rivers and streams to move to the sea to spawn. Spawning runs take place in either the wet season or in autumn.

How to Read the Water.

The shallower the water, the more wary fish seem to be. In a deep river, the angler's approach does not have to be quite as stealthy as in a shallower one.

Fish at rest always face into the flow of water. They have a small blind spot behind them, making it advantageous for fishermen to work upstream. Also, any

silt or sand dislodged while wading will be carried downstream and not over the fish. For these reasons, with downstream wading it is more difficult to achieve success without alerting the fish.

Clumsy and careless wading is a primary cause of not catching stream fish. Each foot must be placed down as quietly as possible since the ripples and shock waves emanate outward as the angler wades. To prevent this, movements must be extremely slow.

Fish in a stream generally stay out of the main current, but close enough to grab a passing morsel. If one fish is caught in a particular spot, there is a good chance that another will take its place within a day or so. With experience, an angler can learn to read the water surface and to know what is underneath. Slick places indicate a rock below the surface; the outside bend of moving water will be deeper than the inside of the bend; and rocks, trees and other structure that break the flow should all hold fish.

How to Fish Streams, Creeks and Rivers.

Generally more fish are in a stretch of water than most people realize. Recreational anglers are always amazed by the number of fish present when scientists electroshock a section of stream to count fish. However, finding and catching these fish is quite another matter. The key for the successful angler centres on understanding the requirements of each species and applying that knowledge to a specific area. Riffles, rapids, springs or feeder streams entering the main flow increase the amount of oxygen. Based on the time of year, water temperature, oxygen content, substrate and structure, an angler can usually determine where fish will be.

In moving water, most species require protection from the current and take up lies where there are pockets of "dead" water alongside the faster flow, such as behind snags or rocks. A fish will not chase bait very far into the current, but will dart out, grab the prey, and return to protection. Slower rivers do not present the same problem, but fish still have to

expend energy to hold a position in flowing water.

The best method toward a successful catch is to approach a fishing area carefully and then to present bait so that it appears natural. A free-floating offering such as a worm or live shrimp should drift with the current and not be dragged upstream by the line.

Locations should be selected just as carefully when fishing from a boat. Drop-offs, shorelines, logs, weeds and other structure hold fish. When the water in a river rises rapidly, fish have a tendency to move closer to shore to look for food in the newly flooded areas. With falling water, they will ease away from the banks.

Lakes and Dams

Characteristics

Lakes are generally inland bodies of fresh water. Some were formed naturally; as moving sand masses blocked the river course, by the movement of the earth's crust and by changes in the course of a river.

Blocking rivers to impound water as dams and weirs have created many of the lakes in Queensland. Most of these impoundments have been developed to generate electricity, to control flooding, to serve as drinking water reservoirs or to supply water for irrigation. A river usually runs through an impoundment, which has some form of inlet and outlet.

Farm dams are miniature lakes. Most are bowl-shaped and are used on farms as a source of water for crops or livestock. A creek or other source of flowing water empties into a dam, often with an outlet on the other side. Others have water fed into them in times of flood and stored for later use.

An increasing number of dams dot the landscape and offer surprisingly good fishing if they are stocked. A number of closed canals and ornamental lakes in coastal developments also hold fish. Usually, the fish enter as juveniles and wind up trapped when they have grown.

Species Present.

Oxygen, water temperature, food supply and cover determine the species in a particular body of water. Man has sometimes extended the range of some species such as carp and tilapia, by bringing them to Australian lakes and rivers, and by introducing bass, yellowbelly and silver perch into impoundments outside their natural ranges.

Bass, silver perch, yellowbelly and murray cod can tolerate a broad range of water temperatures and are found in the three eastern states. Barramundi, sooty grunter and saratoga have a warmer temperature range and require tropical water. Eel-tailed and fork-tailed catfish have a wide temperature tolerance and are found throughout the State.

If all species struggled for the same place in the aquatic community, the ecological diversity of any body of water eventually would be greatly reduced. Each species carves out a niche that is slightly different from the other species and other creatures. Fortunately, aquatic communities have varied food chains that support many different species. Therefore, a gain in production results from the diverse feeding and space requirements. As a result the harvest should be improved.

How to Read the Water.

The principles of analyzing water and approaching fish remain relatively constant regardless of the lake or the species. It is important to understand that subtle changes in water temperature, oxygen, pH, bottom structure, shadow lines and similar factors make a significant difference in locating fish.

Fish tend to locate along transitional zones. The bottom may change from sand to rock or from mud to weeds; a drop off may occur or slope into deep water; or water in one sector may be a slightly different colour. These variations, no matter how minor in appearance, may be the key to successful angling.

Yellowbelly seldom stay in open water and characteristically move toward some form of structure. Murray cod are ambush feeders, lurking in or near rocks or an object that conceals them. Catfish and carp probe the bottom whereas bass and barramundi remain near the bottom at times, often seeking a spot just above the thermocline. They can be found on points and sandbars in the deeper water feeding on small fish. Eel-tail catfish nest in shallow water in the spring and later can often be found where weedbeds drop off into deeper water.

Fish are usually wary. This helps them to survive and can also make them difficult to catch. They utilize their excellent senses of vision and hearing, detect motion with unerring accuracy using their lateral line, and also use their sense of smell. Therefore, a cautious approach is required of an angler.

When fishing from the bank the angler should stay well back from the edge and make casts from a semi-camouflaged position. Also, a low profile makes it difficult for fish to spot the human intruder. Walking quietly helps to mask sounds, which can be transmitted into the water. Aboard a boat, banging or scraping sounds echo through the water. The sound of an engine also can be a negative factor as well as the wake from a boat as the water crashes against the shore. Boats should approach a fishing area at idle speed without running over the spot to be fished. The key lies in not disturbing the fish. A silent approach increases the odds for a successful fishing experience.

How to Fish a Lake or Dam.

Most fish are opportunity feeders. They select food from a variety of choices in the aquatic community. When an abundance of a particularly choice food is available, they often specialize.

With either natural bait or artificial lures, the presentation must be realistic. It should appear that the offering is part of the normal food chain. Hunger is certainly a major motivating factor, but fish also respond as predators ready to strike something that moves. At times,

they even exhibit antagonistic behaviour when biting an intruder to drive it away.

In deciding where to fish, consider the season, water temperature, oxygen, pH, and the types of structure. Try to determine where the natural food supply is located. Once an area is selected, look for transitional zones or edges as well as other significant features, such as a sloping point or the outer fringes of a weed bed. Putting the puzzle pieces together becomes a mental exercise.

Estuaries and Bays

An estuary is a mixing zone where fresh water from streams and rivers meets the salt water of the sea. This forms a habitat that often supports both fresh and saltwater life.

Characteristics.

The specific salinity content in this transitional zone becomes a critical factor that determines which species will be present. Salinity levels do not remain constant, but vary with the amount of fresh water entering the estuary or the amount of saltwater incursion. Brackish water has some salt, but not as high a level as in oceans.

Estuaries serve important purposes. Some 70 percent of all marine species are dependent on this type of habitat during some phase of the life cycle. Others, to survive, feed on forage that requires estuaries.

This is also a prime area for spawning and for juvenile fish to feed and grow. The young of many species remain in estuaries for extended periods of time. Food is available in this mixing zone and predators often enter it to feed.

Species Present.

Most estuary fish can tolerate a wide range of salinity levels and many saltwater fish such as bream, mullet, catfish, sharks and mangrove jack can be found in the lower freshwater reaches of rivers. A typically productive estuary may not yield many fish after strong rains because of the amount of fresh water that

suddenly flows into it, lowering the salinity. The fish move out into the nearby coastal waters and return as the saltwater penetrates back, up the river.

Again, water temperature, turbidity and oxygen are critical considerations. Bass, barramundi and jungle perch mature in freshwater but as adults move down into the lower estuary to spawn. These catadromous species return to the sea to spawn and often wait in estuaries for ideal conditions. Areas that have higher salinity provide ideal habitat for mulloway, tailor, whiting, trevally, cod, fingermark and tarpon.

Tides, topography, and morphology affect most estuaries, but salinity and temperature are the prime factors in determining the aquatic community in any given sector.

How to Read the Water.

Estuaries have current caused by the tides or by the entrance of streams and rivers. Fish orient to the flow of water. Where tidal influences are evident, the fish adjust to the rise and fall of daily tides.

Many estuary waters are relatively shallow with deeper channels running through them. Fish prowling these flats are particularly sensitive to noise and intrusion. A stealthy approach is critical. Boats should be steered around the area to be fished and the engine shut down some distance from where fishing will take place. In some areas an electric motor is used to propel boats. Wading is also an excellent technique for reaching fish quietly.

Shorelines and structure often host fish in an estuary and concentrations of food attract them. Fish also take advantage of the tide, moving farther up an estuary or across a flat on incoming water and dropping back on the falling tide. Since fish follow definite patterns in many waters, anglers who have learned the routes can take advantage of them.

In the bigger bays such as Moreton and Hervey Bay there is a blending between estuarine and ocean conditions with habitats ranging from mangrove lined

channels to shallow reefs, sand banks with seagrass and deep channels that pelagic fish roam in.

How to Fish Estuaries and Bays.

Estuaries often contain a number of fish species that occupy different niches in the aquatic community. Catching them requires techniques targeted to the particular species sought. A small bait fish on the bottom may entice summer whiting, but barramundi and mulloway would probably ignore it.

First, decide on the species to be caught. Know the habits of the fish and seek the type of habitat most likely to be occupied. The tackle, rig, and bait must then be tailored to the species. In some areas, it is possible to catch several different fish species on the same artificial or natural bait. Fishing from piers also allows anglers to fish in deeper water without having a boat. These elevated structures can extend up to 100 metres out into the water and may be up to 10 metres above the water level. Piers permit anglers to fish an area and also to get their lures and bait further out into the water than a cast from the shore.

Wetlands

Many wetlands generally reflect nearby rivers or lakes. They represent an area of overflow, and larger fish and baitfish should be present. Usually, fish invade a wetland during periods of high water, retreating instinctively when water levels drop.

Characteristics

Most wetlands contain fish in times of high water and as the water level drops they make their way back into the main river or billabongs. The run-off channels entering the main river provide prime feeding locations. Billabongs provide nursery areas for many species and a fresh source of forage when they are again flooded in the next wet season. Deeper permanent water holes in the wetlands can hold large fish.

How to Read the Water.

Wetlands are characteristically shallow, which dictates a quiet approach. Channels in some make it possible to use a boat. In northern wetlands, wading is not recommended owing to the presence of saltwater crocodiles

A wetland should be analyzed the same as a lake, pond or river. Fish seek out some form of structure and the angler must recognize prime habitat. This could include points, pockets, weed beds, trees or a particular type of bottom among others.

How to Fish Wetlands

Because they are shallow and have a great deal of vegetation, wetlands are difficult to fish. In open spaces, traditional natural baits and lures may be used, but weedless lures must be used in vegetated areas.

Oceans.

Three-quarters of the earth's surface is covered by oceans. These massive bodies of water have many moods, and because of their size are complex ecosystems. Uninformed people believe that the oceans of the world are endless wells with unlimited numbers of fish ready to be caught.

Despite the immensity of the oceans, most of the area is too deep, cold and lifeless to hold sport or commercial species. Only a relatively small area in the upper reaches of the oceans support fish. Also, loss of habitat, as well as severe fishing pressure by both the commercial and recreational industry, has threatened the existence of a growing number of ocean species.

Characteristics.

Water temperature and depth are the two primary factors in determining the aquatic community in any part of the ocean. The waters within a few miles of shore are by far the richest zone and the place where the food chain has its broadest base. The deeper the water, the less food there is to support life. Certain species are pelagic,

which means that they roam constantly and do not require specific cover. To survive, pelagic species are dependent on schools of forage fish.

Trying to understand the complexities of an ocean in one lesson borders on the impossible. There are tides with which to contend and ocean currents that run like massive rivers, pulling surface water along with them, and in some areas, creating an upwelling along the sides, providing a productive area for anglers. This upwelling brings nutrient-rich water from the deep to the surface. A warm sun will cause microscopic plants to utilize the nutrients, small animals (zooplankton) eat the plants, fish eat the zooplankton, and the food chain begins, again.

Species Present.

The waters off each section of coastline contain several species of fish. More species are found in warmer waters than in the colder ones. Ocean fishing is usually extremely seasonal in terms of species with timing being critical to capitalize on the sudden abundance of a species.

How to Read the Water.

When water temperatures are tolerable and an adequate food supply is present, marine sportfish appear. They may linger in an area for days, weeks, or months. Ocean species often embark on massive and long-distance migrations.

Those wishing to fish further out in the ocean must board a boat to reach the quarry. At times, schools of fish will be on the surface and vulnerable to anglers who find them. Usually, it is a matter of deciding which species to catch and then in locating favourable conditions.

Bottom dwellers orient to rocks, reefs and soft bottoms, while pelagic species follow forage fish and seek comfortable water temperatures. Obviously, each species has its own habits and habitat.

How to Fish the Ocean.

The ocean offers diverse fishing opportunities, ranging from bottom

dwellers to species roaming the seas along the edge of the continental shelf. Techniques encompass everything from trolling to drifting or anchoring and methods such as berleying, casting and live baiting.

Newcomers should start with the most abundant species in the area and become proficient. One may easily try other types of fishing once experience is gained.

Along most coastal areas, charter boats cater to first-timers as well as to veterans. The cost is relatively inexpensive and these boats specialize in locating fish for the customers. Deckies on board are more than willing to give instruction and most vessels supply the appropriate tackle.

Deep sea fishing is also very popular. Just a few years ago deep sea fishing was the pleasure of but a few relatively rich people. Today, with modern boats and up-to-date shore facilities, marine recreational and sport fishing is a rapidly growing form of angling.

As equipment and knowledge of the sea improves, the number of persons seeking their recreation in this manner will doubtless continue to expand. Even though deep sea fishing is still relatively expensive it is extremely challenging and therefore attractive.

It takes a great deal of skill to fish at sea. Seamanship of the highest order is required with a knowledge of tides, currents, electronic equipment, heavy fishing tackle, and the habits of marlin, tuna, and/or sharks and other species being basic for success and safety.

Many persons who do not wish to invest the sums necessary in their own boats and equipment, charter a boat by themselves or with friends to experience the thrill of deep sea fishing.

Rather than fishing from boats, large numbers of anglers fish the ocean from the shore. One popular method of shore fishing is called surf fishing. Anglers fish from the beach or wade into the water along the coasts. There is usually little visible structure so anglers must learn to detect the sandbars and gutters, pockets, tide rips and other such areas where fish may be present.

The tackle for beach fishing includes heavy reels, usually sidecast or spinning with 6 – 8kg line, using rods up to 4.5 metres in length. A heavy sinker is often used to hold the bait on the bottom. Long casts are made and bait is often used unless fish are visible.

QUEENSLAND INC.



LESSON 4

HOOKING, PLAYING AND RELEASING FISH



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LESSON 4

Hooking, Playing and Releasing Fish

Lesson Objectives

Following this lesson students will:

1. Realise that fish strike and fight in different ways.
2. Know effective methods of striking (setting the hook) fish.
3. Be able to land a fish from shore, boat, pier, and jetty.
4. Be aware of the danger presented by some fish with their teeth, spines, and gills.
5. Know how to handle fish in a safe manner.
6. Be able to release fish without harming them.

Materials For The Lesson

1. Photocopies and overhead transparencies of the graphics.
2. A package of large hooks and 3 or 4 lures.
3. Several hook sharpening devices, including files and hones.
4. One pair of needle-nose pliers for each 3 students.
5. A rod and reel combination with a star drag system. A practice casting plug should be tied onto the line.
6. Several different landing tools to show students e.g. nets, gaffs and a bridge net to be used from a pier (if they are available in your area).
7. A mounted fish, preferably one with sharp teeth.

TEACHING STRATEGY

Lesson Content Outline

Classroom Procedure

I. INTRODUCTION

1. Introduce students to the lesson objectives.

2. Begin the lesson by explaining that they will learn several techniques to help them catch a greater percentage of the fish that strike their lure or bait. Many fish are lost due to dull hooks, poor fish fighting techniques and poor landing methods. Also, fish must be carefully handled to avoid injury to the angler and to the fish. Some fish have very sharp teeth, spines and gill plates that can cause serious cuts and punctures. Stress that, if fish are to be released, the decision must be made before they are landed. Fish that will be released must be handled very carefully so that they survive.

3. Divide students into groups of three and distribute hooks and needle-nose pliers. Demonstrate the proper method of sharpening a hook by filing both sides of the point and then the bottom to form a very sharp edge. Have the students take turns sharpening a hook and then testing its sharpness on a fingernail. A sharp hook digs into the fingernail while a dull one will slide easily across the fingernail. Demonstrate how to hold the hook with the pliers during the sharpening process. Urge students to sharpen all of their hooks before using them. Even new hooks are usually not very sharp and dull hooks result in lost fish.

II. Hooking, Playing and Fighting Fish

A. How to Strike a Fish

4. Discuss how species of fish strike lures or baits in different ways. Talk about popular species in your area. Some fish will mouth the bait and play with it. Others will take it immediately and move off with it. Experience is the best teacher here. Ask students to relate their experiences in trying to catch fish and what they have learned.

B. Setting the Hook

5. Setting the hook (striking the fish) begins to bury the hook. This involves pulling the lure toward the angler. To demonstrate proper hook setting, utilize the following steps:

- (1) have a student stand on the casting plug,
- (2) move several steps away and face the student,
- (3) hold the rod at about a 10 o'clock position,
- (4) pretend that a fish has taken the bait, while reeling up the slack in the line,
- (5) lift the rod and wind in the line at the same time pulling a curve into the rod,
- (6) keep the rod slightly bent as you reel in the fish. Explain to the students that it is important to keep the line tight and the rod tip up so that they can control the fish.

(7) The only time that slack should appear in the line is the time when a fish jumps. Then the slack will prevent the line breaking when the fish shakes its head. Have several of the students demonstrate this technique.

C. How to Play Fish

6. Ask the students if any of them has ever caught a big fish, that is, one that they just could not reel in. Lead into a discussion of the fish fighting technique called "pumping". Demonstrate this technique. If necessary, read the attached material for Lesson 4 to learn the proper procedure.

7. Ask students if they know the purpose of the drag on a reel. Using the rod and reel, show them where the star drag is and how it works. Explain that the drag is especially important when fishing for large fish that can possibly break the line or the rod. The drag should be set so that the fish can take line off the reel at no more than 33 percent of the line's rated strength. This may seem very light, but with the rod tip held high, there is still a lot of pressure on the fish and it will tire rapidly.

D. Landing fish

8. Ask students if they have ever landed a fish and, if so, how they did it. Some may have used a net or other tool, but most probably they had beached it or had lifted a small fish from the water to the boat or bank. Discuss proper landing techniques such as:

- (1) landing by hand while being careful of teeth, spines and gill plates.
- (2) landing by leading a fish into a net;
- (3) by beaching, but only if the fish is to be kept; and
- (4) by gaffing and tail roping.

III. Handling and Releasing Fish

A. How to Release a Fish

B. How to Hold, Handle and Unhook Fish

9. Ask students if they have ever released a fish. Discuss the necessity of handling fish very carefully if they are to be released. If a fish is to be released it is best to keep it in the water, carefully removing the hook and letting the fish swim away. If a fish must be handled, the angler's hands should be wet (as should anything else with which the fish comes in contact, e.g. a measuring board), and the fish handled as little as possible to remove the hook before placing the fish back in the water. Mention that fingers should never be inserted into the gills of a fish or the gills damaged. Mention also that any fish that is to be released should have its weight fully supported throughout and on no account should it be held up solely by its jaw or gills. If the hook cannot be removed without hurting the fish, the angler should cut the leader or line as closely to the fish's mouth as possible. The hook will rust out or will pass through the fish in a few days and the fish will not be harmed. After the hook is removed, the fish should be gently placed back into the water, not thrown. Rough handling will damage the slime coating of the fish allowing fungus to develop, which will kill the fish.

10. Using the mounted fish or, if that is not available, with the graphic of a fish, point out the places on a fish that can harm an angler. Point out the mouth, the back spines and the gill plate. If you have a mounted fish, let the students touch the sharp teeth, the spines and the gill plates. They can then determine how much damage these can do. Also stress the importance of being extremely careful when removing a lure or hook from a fish. If the fish moves suddenly, the hook could become imbedded in the angler's hand.



INTRODUCTION

Fishing is all about catching fish. Catching fish involves hooking, playing and landing. Hooking methods will vary, based on the use of different types of lures or bait. Fighting methods also vary since some fish can be easily reeled in and brought to the angler, while others will make long runs, jumps, shake their heads and otherwise try to dislodge the hook. Coping with this is not just a matter of luck, but requires knowledge and skill, to land the fish easily and efficiently. Fish can be landed by a number of means: hand, beaching, netting, tailing and gaffing. The best landing method will depend upon the fishing conditions, fish species and size.

Once fish are landed, they can be kept for food or mounted as a trophy. If a fish is to be released back to its environment, this decision must be made prior to landing it, since a fish must be properly handled to have the maximum chance of survival.

Anglers can incur injuries while handling fish. Their teeth, spines, fins, gills and gill plates can all cause cuts or punctures. Each fish differs, and proper handling depends upon knowing the danger intrinsic to each species.

NARRATIVE

Hooking and Fighting Fish

Tackle Considerations.

All fishing revolves around catching fish. Catching fish is dependent upon having good tackle, making sure that it is suited for the target species, and keeping it in good repair.

Proper tackle consideration involves making sure that the rod is appropriate for the species sought. The line must also be adequate for the rod, sinker or lure being used. A light line used with both a stiff rod and a heavy sinker, or a light line with a stiff rod and a heavy lure, might

break with normal casting or striking force, (for that rod, sinker or lure).

Hooks must also be sharp. Most anglers agree that the best method of sharpening hooks is to "triangulate" the hook by turning the round profile of the hook point into a triangle with flat sides. To do this, use a sharpening tool (file) to flatten both sides of the hook point at an angle and then flatten the bottom (outside) of the hook point. The result will be a razor sharp hook that will penetrate the fish's mouth easily and quickly.

Detecting Strikes.

When anglers use bait, fish do not usually strike viciously, as often happens with a lure.

This does vary with the type of fishing and bait used. However, whiting, bream, flathead, mullet and catfish may mouth the bait carefully, take the bait immediately or play with it for a while. Fish in larger schools will often pick up a bait immediately to prevent another fish from getting it. Stingrays, catfish and carp will often play with the bait on the bottom. Often a sure pick-up can be determined only when the fish swims off with the bait.

Fish that take suspended baits exhibit similar behaviour, in that they will often pick up a bait prior to taking it completely. Fish in the surf often strike much more aggressively in order to secure the food before it tumbles in the rough conditions. When bait is trolled, fish are more likely to strike solidly to "catch" the bait. Even then it is often necessary to allow a fish slack in the line to take the bait completely and to swallow it. This is particularly true in offshore big game trolling.

In some cases, fish treat lures almost as they would treat bait by picking at it and taking it only after some examination. This is true of lures such as soft plastic jigs used for flathead and various flocked or sponge construction lures. In these cases, experience teaches just how to react to each lure.

Many anglers believe that fish should be struck immediately since there is no natural food or bait to keep them taking or tasting the lure. However, as an exception to this, some anglers use the currently popular scents to flavour lures, which trigger strikes from fish. Many strikes from fish do not really require setting the hook since the fish strikes a moving lure and, in essence, impales itself on the hook. In these cases, the fish is immediately detected.

Setting the Hook.

Setting the hook is the method by which the hook is buried or forced into the fish's mouth. Striking (setting the hook) involves pulling the lure towards the angler. This can be accomplished in two ways.

One way is to move the rod up and back at an angle, much like using a lever, to pull the line towards the angler. The rod can be angled at any position, although most strikes are made with the rod directed up and back. This motion should be made quickly. With baits, lift the rod and wind the line. As the weight of the fish is felt, the rod will pull down into a curve providing the force needed to drive the hook home.

The second way is to pull on the line as is often done while fly-fishing. Fly fishers sometimes use just a short sharp pull of the line to set the hook. Other fly fishers use a short snap of the rod to accomplish the same thing. Most will use both to exert maximum force to sink the hook into the fish. However, too much force will break the line or leader, bend the hook or tear the hook out of soft-mouthed fish. This is also true while fishing with spinning and sidecast equipment.

In most cases, one distinct firm lift of the rod is all that is needed to sink the hook if the hooks are sharp. Some situations require more forceful strikes than others, for example a single very forceful strike is necessary when fishing a plastic worm rigged.

Fighting the Fish.

When a fish feels a hook, it struggles to get free. This struggling might involve jumping, making a long run, running back under cover or into obstructions or swimming around obstacles. Landing the fish involves coping with these challenges by fighting (or playing) the fish, preventing it from getting free.

Each species of fish fights differently. Tuna and mackerel are strong, powerful fish that make long runs. Billfish both run and jump. Kingfish dive for the bottom. Barramundi and tarpon jump wildly when first hooked. Flathead and cobia often come to a boat placidly but become wild at boatside. Mangrove jacks and coral trout head straight back into cover and snag the angler on the obstruction that is their habitat. Fish hooked and played in shallow water are often more likely to jump rapidly, repeatedly and more frantically than those hooked in deep water. Deep water fish often seek the bottom.

It is possible to reel in many small fish directly. They will fight, but this can be overcome with the strength of the line and the action of the rod. However, much of the fun in fishing is gained by using tackle that will allow the fish to fight.

Fighting any but very small fish involves a technique called "pumping". This is a method of gaining line against the power of a big fish so that the angler can ultimately land it. The incorrect method of landing big fish is to try to reel or winch the fish to the angler. This is hard to do, can strain the tackle (principally the reel) and is not efficient or quick.

Pumping involves a method of levering the fish in with the rod. To do this, reel until the line is taut and the rod is nearly horizontal, pointed toward the fish. Then raise the rod to a 45 to 60 degree angle to lever or pull in the fish. At this point, while at all times maintaining a fighting curve in the rod, rapidly but smoothly lower the rod again, while reeling in the line. Make sure that the line is under pressure and the rod is not lowered so rapidly that slack develops in the line or

that it loops around the rod tip. With the line still taut and the rod back to the original, near horizontal position, repeat the process to gain more line.

Many experienced anglers use this method but lever the rod sideways to turn a big fish that is difficult to land. This pumping, combined with the proper use of the drag, allows landing of fish whose weight approaches or exceeds the strength of the line.

At any time when the fish is pulling line off against the drag there is no need to pump and wind as the fish is using its energy in trying to overcome the resistance. Whenever the fish stops, then pump and wind to pull the fish back towards the angler.

Jumping fish can dislodge a hook or lure and get away. Coping with jumping fish is a major problem even though they are fun to catch and watch. Some experienced anglers will even hold their rod tip underwater in an effort to keep the line down and to prevent or discourage the fish from jumping.

Often the best procedure to cope with jumping fish is immediately to lower the rod so that the line is at a low angle, not, in effect, "pulling" the fish up. Another method, sometimes combined with the above, is to push the rod toward the fish when he jumps. This creates slack in the line and prevents sharp impact (strain) on the line as the fish shakes its head.

Most losses with jumping fish occur when using heavy lures such as spoons, heavy plugs or jigs since these lures will wear a hole in a fish's mouth as the fish shakes its head, thus allowing the fish to toss the lure free. The loss of jumping fish is often not the fault of the angler, regardless of the action taken.

Landing Fish.

Fish can be landed by hand or with tools made for that purpose. These tools include nets, gaffs and tail-ropes.

Landing nets are most commonly used for landing fish and vary in several ways.

For boat or shore fishing, long handled nets are used while short handled nets are adequate for stream fishing. The size of the net will vary according to the size of fish expected to be caught. Some specialty nets are also available, including circular no handle nets on a long rope used for pier, bridge and jetty fishing.

The size of a fish makes a big difference in landing it. Small species such as whiting, small bass, bream, tailor, grunter and similar species can usually be landed by hoisting the fish out of the water with the rod and depositing it on the boat, bank or pier. Care must be taken when doing this with soft-mouthed fish, when fishing with small, light wire hooks, which might bend, and when using light line.

When landing any large fish, first back off (loosen) the drag as a quick erratic run by the fish might otherwise break the line. When boat fishing, be aware that large fish will sometimes try to run under the boat or around propellers. For this reason, be sure that the fish is tired out. Fish that are to be released should not be completely exhausted since this makes recovery far more difficult. Landing by net, gaff or hand is then possible with nets and gaffs being more popular for most boat fishing.

When fishing from the shore, anglers find beaching is a popular way to secure fish. Since beaching will damage the slime coating on the fish, it should be done only if the fish will be kept. To beach a fish, lead it into increasingly shallower water, gradually sliding the fish onto dry land on its side. Once on dry land, or in the very shallow water, the angler can lift the fish by the gills and remove the hook.

When hand-landing the fish, the angler can grab the fish by the gills (being careful of the hook or hooks in and around the mouth), or by the body (under the belly). If the species has a strong finned tail that will not collapse as the fish is lifted, grab it at the wrist of the tail.

For most freshwater fish, a “comfort lift” with the fish lying on its side and lifted in the middle of its body by an open hand, thereby putting a curve in its backbone, will have the fish lying placidly in the angler’s hand.

When landing bass by the mouth, use a popular way with the thumb and index finger gripping the fish by the lower jaw, but taking due care of hooks and the size and strength of the fish. This procedure immobilizes the fish temporarily and makes removing the hook much easier. Do not lift large fish this way if you intend to release the fish, as hanging in this position will damage the internal organs.

Netting a fish does require a certain technique, regardless of whether it is done from a boat or shore. First, the fish must be under the control of the angler as much as possible. Next, the fish must be led alongside the shore or boat. The net should be placed in the water and the fish led head first into the partially submerged net. Then, if the net touches the fish, the swimming movement of the fish will drive it into the net, not out of the net as will occur if the fish is netted tail first. Once the fish is completely in the net, the net must be raised. With heavy fish, also grab the rim of the net to prevent strain on the net frame.

Fish to be gaffed are usually large and difficult to net. Once the fish is under control, it must be led to the landing area and the gaff placed so that the hook will hit the fish just off centre of its body weight. Very large fish should be hit in the muscular body, while smaller fish can be hit anywhere, including the stomach area.

Gaffs are large, usually barbless, hooks on long handles, used to hook fish at the boat or on shore in order to land them and prevent them from breaking the line and escaping. Gaffs are typically described by the hook size (distance from the point and shank) and the handle length. Specialty gaffs include hand gaffs; a small gaff with a two to three inch hook on a very short handle used to lip gaff fish such as barramundi. Except for those fish lip-

gaffed to remove a hook, lure or fly (such as is common with big barramundi), gaffs should only be used if the fish is to be kept for food or a trophy. A gaffed fish, which is released, will die even if it appears lively at the time of release. Gaffs used off the rocks may have handles up to 6 metres long to enable the gaff man to reach the fish without being swept into the sea.

Shark fishermen primarily use tail-ropes, since sharks have a thin but strong "wrist" at the tail that allows using a noose on the fish for landing. Since the tail-ropes can damage the fish, they are used only if the fish is definitely to be kept.

Some specialized landing techniques are used for fishing from a high bridge, jetty or pier. In these cases, so-called "cliff gaffs or bridge nets" are used to land fish that are many metres below the anglers and impossible to reel in. Bridge nets have a circular rim supported at three points around the rim and tied to a single rope. Jetty or cliff gaffs are similar, but consist of three or four pronged, sharp grappling hooks on a single rope. In all cases, these devices are lowered to the water, submerged, and after the fish is led over the net or gaff, the gaff or net is raised to secure the fish. Once the fish is landed, it should be unhooked and immediately placed on ice.

Handling and Releasing Fish.

Except for those fish released in the water by removing the hook or cutting the leader, fish must be “handled” in a suitable way. In all cases, the gentlest handling is best.

All fish are caught on hooks, so due care must be used when handling freshly caught fish, particularly those taken on multiple hook lures where some hooks are free swinging. Also, teeth, gills, and fins can puncture or cut. Fish such as mackerel, tailor, mangrove jack, wahoo, pike and barracuda have sharp teeth that must be avoided. Even fish such as flathead and bream have small teeth which can cause abrasions if handled improperly.

Bass, barramundi, and other species have sharp gills and gill plates which can cause bad cuts. Catfish are known for their sharp spines in the dorsal and pectoral fins. Other fish, such as flathead, also have sharp spines that can cause puncture wounds and infections. It is vital to know the species of fish caught so as to avoid contact with such areas and to prevent accidents.

Fish to be released should be held as little as possible. The best release is to keep the fish underwater, using the hand or pliers, gently remove the hook or lure from its mouth. An excellent solution, for larger fish or those fish that have taken a bait so deeply that the hook cannot be easily removed, is to cut the leader close to the fish's mouth. In most cases, the hook will rust out (the acids and enzymes in a fish's gill tract being a major factor) or pass harmlessly through the fish.

If the fish must be taken from the water, use a wet hand or wet rag while holding the fish firmly but gently to remove the hook. Never place the fish on any hot and/or dry surface. Replace the fish back in the water as rapidly as possible. Never throw a fish back into the water. Instead, gently place it in the water, and if necessary, move it back and forth with care to restore oxygen to its gills until it is ready to swim away. Holding the fish head-on into the current or running the boat forward to get a flow of water over the gills will also help revive a fish before release. Release fish in shallow water so that they can recover before swimming in open water or fighting a current.

Where a fish, brought up from deep water, has its gas bladder protruding from its mouth, special handling is required to allow the fish to return to the depths. Fishing guides and boat captains should be aware of, and able to instruct in, the latest recommended technique of deflating the gas bladder.





LESSON 5

CARE, PREPARATION AND COOKING OF THE CATCH



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LESSON 5

The Care, Preparation and Cooking of the Catch

Lesson Objectives

Following this lesson students will:

1. Understand how to store fish properly and how this varies with the species.
2. Be aware of safe methods of using knives to clean fish.
3. Know several methods of cleaning fish.
4. Know how to cook fish.
5. Know several methods of preserving fish.
6. Be aware of potential toxic substances in fish.

Materials for the Lesson

The materials needed for this lesson will vary depending upon how involved you wish to become. It can be taught in a classroom setting without any "hands on" type of involvement by students, or you can conduct the class in a situation with the students actually cleaning fish, cooking and eating them. All of the materials below will be needed for the latter of these procedures, along with an appropriate setting such as someone's home or a park with some type of cooking facility. Assistants to help with the cleaning and cooking of the fish would be advisable.

1. Several fish of different species that can be scaled, skinned, and filleted.
2. Several fish cleaning items including fillet and butcher knives, scalers, pliers, cleaning boards with clamps, or boards for cleaning and a hammer and nails.
3. An ice chest with the fish kept fresh in it.
4. Cooking items: tin foil, skillets, cooking oil, flour, corn meal, etc.
5. Eating utensils and dishes.
6. Photocopies of the fish cleaning graphics in the appendix and overhead transparencies of the same if the lesson will be conducted in a regular classroom. Photocopies of recipes in the content of the lesson.

TEACHING STRATEGY

Lesson Content Outline

Classroom Procedure

I. Introduction

1. Introduce students to the lesson objectives.

II. Handling the Catch

- A. Live Wells and Stringers
- B. Storage on Ice
- C. Field Dressing

2. Explain that the lesson focuses on what to do with the fish after it is caught until it is served as a tasty, nutritious meal, or saved to eat another day. Most fresh fish will keep on stringers (tethers) or in live wells. However, if they die they should be field dressed or placed on ice. Most saltwater species must be kept on ice to preserve their freshness. The melting water from the ice must be drained away since the ice water will affect the quality and taste of the fish.

3. Field dressing involves removing the gills and entrails of the fish. These parts spoil most rapidly and can affect the taste of the fish if they are not removed. After removal, the fish should be thoroughly rinsed, wrapped in damp rags (the evaporation will help cool them), or preferably placed in a plastic bag on ice.

III. Methods of Cleaning Fish

- A. Skinning
- B. Scaling
- C. Filleting
- D. Steaking

4. Ask if anyone has cleaned a fish and, if so, what he/she did. Explain that there are several ways to clean fish and that the method used can vary with the size and the species of fish. For example, most fish are scaled but some are skinned. Many fish can be prepared whole, the bone being removed after cooking, during serving or during eating. Some species lend themselves to filleting which removes the bones before cooking. Some very big fish are often steaked, but many are also filleted and cut into individual portions. The angler has the choice of cleaning method.

5. Demonstrate how to clean a fish properly by scaling, skinning and filleting. Stress the importance of safe handling of the knife both by discussion and demonstration. Then divide the class into groups of 2-3 students, each group with an assistant, and let them clean their own fish, with the assistant's help as needed. Cleaning gloves used here will help avoid cuts.

IV. Storing Fish

- A. Refrigeration
- B. Icing
- C. Freezing
- D. Other Methods e.g. Smoking & Pickling

6. After each student has cleaned a fish, discuss methods of storing the fish if it is not to be promptly eaten. Discuss icing, refrigeration and freezing. With older or advanced students introduce smoking, pickling and canning. Review the lesson content if you require additional information on these procedures.

7. Tell the students that they are now going to cook the fish that they have cleaned. Explain that there are numerous ways to cook fish including frying, broiling, grilling, baking, poaching, and microwaving. However, today you are going to fry the fish in cooking oil using either flour, crumbs, or some other breading or batter. Let each student choose the type of coating desired.

V. Preparation

A. Cooking Methods

1. Frying
2. Broiling
3. Grilling
4. Baking
5. Poaching

B. Recipes

VI. Toxins and Fish Diseases

8. Have the students get their fish and with their assistant prepare the fish with the appropriate coating. Again, stress safety with the frying pans and hot oil, and let the students prepare their fish.

9. After cooking, let the students eat their fish, sharing with others who used a different coating.

10. Briefly discuss the potential problem of fish contamination; whether the contamination could occur in the area where it was caught, or is related to the species of fish. There are restrictions on eating fish from some areas of water and restrictions of certain species from these areas. Students should be encouraged to investigate any particular problems that may exist before eating the fish and be aware of any warnings posted in areas where they fish.

11. The students should be encouraged to assist in clean up, both the areas where the fish were cleaned, and the pans, etc. used in cooking and eating the fish. Explain that fish entrails and carcasses attract flies and other insects and smell badly. They should be buried or placed in tightly sealed plastic bags and disposed of in proper waste disposal containers.

INTRODUCTION

One of the great joys of any successful fishing trip comes in eating the catch. Fish are delicious, offer a change in the diet, are increasingly noted by doctors and nutritionists as a healthy alternative to other foods, and are ideal for those on low budgets, low cholesterol, or low calorie diets. If properly cleaned and cared for from the time they are caught until they are cooked, fish are excellent eating.

Unlike other food, fish do require special, but not difficult or extraordinary handling. This special handling begins when the fish are caught, and continues through cleaning, storage, cooking and serving. Every household has the tools and storage facilities for handling fish. Hence, fish can be a staple food and served on a regular basis.

NARRATIVE

Handling the Catch

Fish are a valuable resource. If they are not used for food or for the occasional trophy mount, they should be returned to the water promptly.

To release fish, use pliers or fingers to remove hooks from the fish's mouth while it is still in the water. As a result, the fish does not have to be touched or brought into the boat. Fish that are handled or allowed to lie on a boat deck, pier, jetty or shore will lose their protective slime coating, severely decreasing their ability to survive. Fish that have to be removed from the water for release should be handled firmly but gently. Hands should be wet to protect the fish's mucous covering. Do not lift fish by the gills, by the eyes, or with a gaff on the body of the fish. However, some fish might have to be lip gaffed to remove hooks. If you intend to release most of the fish you catch, use barbless hooks or flatten the barbs on ordinary hooks.

Fish that are to be eaten must be kept fresh until they are cooked, frozen or otherwise stored. Keeping fish on ice,

whole or on ice cleaned, will keep them fresh. Fish should be killed as quickly as possible and immediately placed on ice. Bleeding the fish by cutting its throat and dropping it into an ice slurry is the best way to preserve the eating qualities. The very low temperature of the ice slurry kills the fish very quickly. Other methods of killing the fish are a solid blow to the head or breaking the backbone just behind the head.

If the fish cannot be kept on ice, field dressing is a must. To field dress, remove the entrails and gills, which are the first areas to spoil. If these are not removed, the whole fish can spoil. When field dressing a fish, use a sharp knife to remove completely all the gills. Then insert the knife into the vent of the fish and run the blade up along the belly to the head. Keep the knife blade shallow so as to prevent puncturing the intestines. Once the body cavity is completely open, remove all the entrails. Most fish have the kidney along the body wall, below to the backbone. Remove this with a spoon, a brush or with your thumbnail.

More particularly for freshwater situations, field dressed fish are best kept by keeping the body cavity open with ferns or grass. If practising this type of storage, use an insulated bag, insulated creel or fishing vest with an insulated pocket to protect the fish from heat. Damp rags are ideal for a wrapping since evaporation helps to cool the fish.

To store fish on ice, field dress them either whole or as fillets. Be sure to have enough ice for the fish and to drain the water from the melting ice. Contact with ice water will adversely affect the quality and taste of the fish. Be aware that regulations may not allow fish to be filleted while you are still out fishing or on the water.

Methods of Cleaning Fish

Skimming.

Removing the skin of many fish also removes fatty tissue that can contribute to a muddy or cloudy taste. How one skins a fish depends upon the species. Most fish are skinned when they are filleted, but some are skinned and cleaned at the same time.

Scaling.

Fish to be scaled are not skinned. Scaled fish are cooked with the bones in the body. The bones are removed after cooking. To scale a fish, hold the fish by the tail and pull or push the scaler towards the head. Do this repeatedly over both sides of the fish until all scales are removed. Since the fish will be cooked with the skin on, remove the head (with all gills), and the entrails.

Scalers range from simple home made devices, such as old time bottle caps (non-screw type) nailed to a board, to plow-shaped devices that will not scatter scales, to serrated rack-like hand tools. Smaller fish such as bream and whiting are usually scaled, but they can be filleted.

Filleting.

Filleted fish have all the bones and skin removed before cooking. The final result is two fillets, one from each side; the meaty portion of the fish. There are two methods of filleting any fish. One is to remove the fillets from the fish by working the knife around the rib bones. The other is to cut through the rib bones, which are removed later.

Special knives are required for filleting. These are long and thin, and tapered so that they are springy and flexible. They must be surgically sharp.

To fillet a fish, begin by laying the fish on its side. Make a sharp vertical cut down to the bone (vertebrae) just behind the gill plate and pectoral fin. Make a second cut along the backbone, from head to tail, cutting down to the backbone (ribcage) and keeping the knife blade on

the same side of the fish as the original cut. Continue to cut down parallel to the dorsal fin until to the backbone, working all the way to the tail. At this point, spread the cut open and work the blade around and over the rib bones, which protect the body cavity. Work to the belly and then cut back to the tail. Do not cut the fillet free from the tail. Flip the fillet over so that it is flesh up and skin down. Using the tail for a grip (the reason you do not remove it), work the fillet knife between the skin and flesh.

The secret to skinning the fillet is to pull on the skin (tail) while using a firm sawing motion with the knife blade. Once the skin is free, quickly wash the fillet in cold water, store on ice or freeze and repeat on the other side. For fish, which do not have a strong tasting skin, skin removal is not necessary.

An alternative method involves the same basic procedure. However, in this case cut through the ribs during the cut along the backbone, making the removal of the fillet far easier. To complete the fillet, use the knife carefully to carve out the rib and pin bones.

Steaking.

Steaking is a method of cutting large fish across the body into steaks or very large fish into manageable chunks. First the fish must be scaled (or skinned) and cleaned as above. Usually fish are scaled only if the scales will interfere with the cutting and steaking process. They are then cut into pieces suitable for cooking.

For most fish, cut steaks through the body, working from the tail to the head since the head provides a "handle" of sorts. Make the steaks a suitable thickness for one serving, usually 12 to 25mm thick. After steaking, trim away any belly fat or obvious bones, but not the vertebrae.

Very large fish can be treated the same way, by cutting the large steaks into smaller individual portions. To make steaking easy, chill the fish or place it in a freezer until it is partially stiffened. Cleaner neater steaks will result.

NOTE. Sharp knives must be used to clean fish. Safe knife handling must be used in all cleaning operations. For this, make sure that the knife is suitable for the task. Use heavy, thick bladed knives for steaking. Use thin, flexible knives for filleting. Make sure that the filleting blade is as long as the width (dorsal to ventral) of the fish, or longer. Wash any slime from hands and the knife handle to prevent slippage. Always cut away from the hand that holds the fish. As an extra precaution in handling slippery fish, some anglers are now using metal mesh reinforced gloves to protect themselves in case of an accidental slip of the blade.

Storing Fish

Fish must be kept alive or chilled from the time they are caught until they are properly stored. Cleaning should be done as soon as possible to preserve maximum flavour, although properly iced or chilled, fish can be kept for up to a day before cleaning. After the fish are cleaned, filleted, steaked or skinned, there are several storage methods possible.

Refrigeration

Fish can be refrigerated for up to two days, although there are variables that will affect this time period. Large fish or large pieces of fish can be refrigerated longer than small pieces. Lean fish will store better than fatty fish. To refrigerate fish, wash under cold water and dry with paper towels, then wrap with plastic wrap, waxed paper or aluminum foil.

Icing

Fish can be iced either whole or after they are cleaned. Icing is the best method to use when transporting fish. Use a good quality insulated cooler. If possible, leave the drain open so that melting ice water will drain. Keep the fish on a rack or at least above the melting ice.

Freezing

Frozen fish will last from one to six months, depending upon the type of fish (lean or fatty), size of fish, freezer temperature, wrapping and preparation methods. The cause of much poor tasting

frozen fish is due to improper wrapping. As a result, air contact with the fish causes a dry, reddish "freezer burn." To prevent freezer burn, wrap the fish in plastic wrap or aluminum foil, then over wrap with freezer paper.

An alternative procedure is to freeze the fish in a block of ice. Standard waxed milk cartons or plastic refrigerator containers are ideal. Drop the fish into the carton, leaving room for the fish to be surrounded by ice. Fill the carton with water. Close and freeze immediately.

Another method is to freeze the fish, remove from the freezer and dip in ice water several times to build up a coating of ice. Then wrap tightly in freezer paper and place in freezer. To thaw frozen fish, place in a refrigerator overnight. Do not allow fish to thaw at room temperature.

Other Methods

There are other methods by which fish can be stored; most involve some form of processing that also cooks the fish or otherwise makes it edible. Smokers are readily available, complete with directions and wood chips for hot smoking fish. Smoked fish is ready to eat and can be refrigerated for up to several weeks.

Pickling is a method of preparation involving brine or lime solutions. The result is a preserved edible fish that can be kept refrigerated for up to two months (usually two weeks for the lime prepared fish). The freshly cleaned and chunked fish is preserved by the pickling solution in which it is stored. Pickled fish can be used in casseroles, as a garnish to a main dish, or as a snack or hors d'oeuvres.

Preparation (cooking) Methods

Most fish are cooked fresh or from frozen packets. Cooking methods include:

Frying

Most fish are pan fried. Pan frying is nothing more than cooking the fish briefly on both sides in hot oil (hot enough to sizzle when a drop of water is dropped in the pan). Pan fried fish can be

coated as desired with flour, breading, or batter. Batter formulas include everything from a pancake type batter to those prepared with spices or beer. Both cleaned fish and filleted fish are typically used in pan frying. Deep frying involves slipping the fish gently into a deep pan filled with hot cooking oil. The fish can be fillets or cleaned small fish, with or without batter. Batter dipped fish are most often used.

Broiling

Broiling fish under the heat of an oven boiler is a rapid method of cooking small fish or fillets. Usually only several minutes on each side is required. Broiling uses a high heat above the fish, with the fish turned over half way through the cooking. The high heat can dry some fish, so basting with butter, cooking oil, lemon-butter or other sauces helps to keep the fish moist and tender.

Grilling

Grilling involves cooking the fish on a grill; usually an outdoor barbeque grill. As with broiling, a high heat, short time period and rapid cooking is standard. Fillets, steaks or cleaned whole fish can be grilled. To grill, set the grill to a high heat, place the fish on the grill, baste frequently and turn the fish over when almost done to grill the other side. Fillets, steaks or whole cleaned fish can be grilled, but thick portions are best in order to keep the fish from falling apart when turned over. The fish will cook rapidly and can be checked by separating the flesh. It should be white and flaky, but not dry and brittle.

Baking

Baking is best for preparing large fish and also helps prevent drying out the lean fish. Baking involves basting the fish with natural juices, butter, cooking oil or sauces, and cooking in a covered pan under moderate heat. Cooking times for baked fish are longer than for pan fried, broiled or grilled fish; usually about 20 to 30 minutes. Excellent variations of baked fish are possible using various sauces and basting made of soups, marinades, and lemon-butter-herb combinations.

Poaching

Poaching is an excellent method of cooking large whole fish and preserves their delicate flavour without drying. Special poaching pans (elongated lidded pans) are made for this. The whole, cleaned fish with the head usually left on is placed on a rack usually supplied with the pan, and covered with a light vegetable or herb spiced broth. The fish is cooked in this broth until done. Simmering is similar to poaching, although it uses a higher heat and a more rolling boil to the liquid. As a result, cooking time is shorter. Since it is cooked in a broth, the cooking time is not as critical as for other cooking methods.

Steaming is a similar method, often confused with poaching, in which a liquid is under the fish, cooking the fish only by the steam emitting from the liquid. Most poaching and steaming cooking times are about 15 minutes. To prevent poached, simmered and steamed fish from breaking up when removed from the pan, place the fish in a cheese cloth wrapper.

Recipes

Recipes for cooking fish are many and varied and can be found in numerous cookbooks, many specifically written for fish and seafood. Fish recipes number in the thousands, but some simple, easy to follow suggestions include:

Pan-Fried Fish

Required: lean dressed whole fish, 1/2 cup milk, one egg, 1/2 cup flour, seasoned with salt, pepper and any special herbs, sufficient cooking oil, margarine or butter for covering pan surface to a depth of 3 - 6 mm, one lemon, parsley.

Method: Mix egg and milk. Dip fish into egg/milk mixture, coat with flour. Place butter or oil in cooking pan and raise to high heat. When a drop of water sizzles, drop in fish. Cook until brown on one side, turn the fish over and cook an equal length of time. Remove from pan onto paper towel to drain, place on serving platter, cover with lemon juice and parsley.

For a variation of this, use a heavier, breaded coating or batter. Various sauces of lemon/butter/herbs are also tasty as a garnish for the finished fish.

Broiled Fish

Required: fish fillets, salt, paprika, chicken stock (broth) (or bouillon cubes), lemon juice and butter.

Method: Coat the baking pan with butter or oil and sprinkle with salt. Heat pan in oven. Remove pan from oven and place fish on the hot pan. Sprinkle fish with salt and paprika. Heat fish under broiler for three minutes, remove from heat, add broth (chicken stock) over fish and return to oven for 10 to 15 minutes. Add lemon juice or lemon-butter juice over fish just before serving.

The above recipe is ideal for broiling since broiling gives the dish the unique broiled taste, while the broth (chicken stock) preserves the moistness of the fish and adds to the flavour. Preventing broiled fish from drying excessively is one problem with this cooking method. Similar recipes call for heavier, thicker additions of soups, salad dressing, sauces, and vegetables.

Grilled Fish

Grilled fish are simple to cook, but one must watch the grill. For this recipe, use steaked fish, whole small fish, or large thick fillets.

Method: Clean the grill thoroughly and coat with cooking oil or Pam. When the grill is hot, coat both sides of the fish with a thin layer of a favourite barbecue sauce (chicken flavour only) or with lemon-butter sauce, and place immediately on the grill. Coat the top side of the fish with sauce as needed. Turn the fish after it appears to be done and grill to a brown on the opposite side. Coat again as needed with sauce. Remove when done, usually about 15 minutes cooking time.

For variations of this recipe, the fish can be previously soaked in wine, sauce,

salad dressing or lemon marinade for several hours. Consult cookbooks for other recipes.

Baked Fish

This recipe will work for many fish, using several different sauces. Large fish are best, such as steaked fish, thick whole, cleaned fish, canned fish, large fish chunks, or thick fillets.

Method: Place the fish in a baking pan. Cover with one to two cups of sour cream, salad dressing, or a thick vegetable stew. Add salt and pepper to taste. Cover, and place in a baking oven for 20 to 30 minutes.

Poached Fish.

Wrap whole fish (cleaned but head attached) in cheese cloth, leaving enough at both ends for a handle. Fill poaching pan with water and a light assortment of small onion quarters, slices of carrot, parsley, bay leaf, salt, and pepper. Bring to a boil and add fish, making sure that the fish is completely submerged. Cooking time is about 10 minutes for most fish.

Other Recipes

Other recipes that go well with fish include sauces, garnishes, salads, soups, breads, and appetizers. Most cookbooks contain recipes related to fish dishes.

NOTE: Different fish species differ in flavour. Bream, whiting, flounder and sole have a light delicate taste and are best when not heavily breaded or cooked with heavy sauces. Tailor, bass, mullet and tuna have a stronger fish taste that often goes well with sauces.

Leftovers

Leftovers should be stored immediately after the meal, either in the refrigerator if they are to be eaten within 24 hours, or in the freezer if freezing is possible, and then eaten within a short time. Some dishes, such as casseroles, stews and chowders might require slightly different handling. Check good cookbooks for specific directions.

Toxins and Fish-Caused Diseases

An angler should be knowledgeable about the fish caught and about any particular pollution problem associated with the species, or the fishing area. One poison increasingly becoming a problem is found primarily in fish from tropical areas. Ciguatera poisoning builds up in the flesh of reef-living fish. Reef fish get this in their system by eating organisms that are toxic to man, even though not toxic to these fish. The toxins are found in higher concentrations in the larger fish species such as barracuda but can be found in as many as 600 tropical and reef living species, including the popular coral trout, and mackerel. Symptoms of ciguatera poisoning include tingling of the lips, tongue and mouth, numbness, nausea, cramps, vomiting, diarrhoea, weakness, muscular pain, blurred vision, partial blindness, skin blisters and a rash. There is also a reversal of perception, (Hot objects feel cold and cold objects feel hot). Mortality rate is less than 10 percent, but recovery is slow. Currently, the most severe problems caused by the toxin are in the coral reef and Hervey Bay areas.

Currently, no area of the State has fish consumption advisory restrictions due to toxic contamination but there have been incidents of fish kills from toxic pollution. Often this is in localized waterways. Since anglers are not

protected by the safeguards, which monitor toxins in commercial fish catches, it is important to be aware of these advisory warnings and of locally posted warning signs.

Presently, PCBs, DDT and Chlordane are the most pressing problems, although fish can become poisoned through halogenated hydrocarbons (PCB, DDT, Dieldrin, PBB), heavy metals (mercury, lead and cadmium), and radio-nuclides (radio active atoms such as strontium-90). Sources of contamination include direct chemical or metal spills, runoff from ground and surface water, and air carried contaminants.

Special cleaning methods can be used when catching fish from areas of hydrocarbon poisoning. These include skinning instead of scaling and removing fatty areas, such as the flesh around the backbone, along the lateral line (side), and from the belly.

Allowable contaminant levels are set, based on the average consumption of fish by people and the knowledge that in people, as with fish, these poisons do build up in the tissue and do not metabolize out in time.

Check reliable sources for any type of poisoning suspected in tropical fish. Check the fishing areas around industrial or chemical plants, and do not eat any questionable fish.



LESSON 6

PERSONAL FISHING SAFETY



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LESSON 6

Personal Fishing Safety

Lesson Objectives

Following this lesson students will:

1. Understand that fishing is not a dangerous activity, but safety must be considered at all times.
2. Know how to dress properly for outdoor fishing situations.
3. Understand the types and uses of PFDs.
4. Be aware of the problems involving insects, poisonous plants and the sun, and the preventative measures and treatment for each.
5. Understand the potential dangers of storms, lightning and flooding.
6. Know how to use a boat in life saving.
7. Understand the dangers, causes and first aid for hypothermia.
8. Know basic first aid procedures for outdoor mishaps.

Materials for the Lesson

This would be a good lesson to involve outside speakers such as Boating Patrol officers. With the wide variety of outdoor clothing and PFDs available, the local sporting goods dealer may be invited to speak about appropriate outdoor clothing for different situations. A doctor, nurse, paramedic, or representative of the St John's Ambulance could talk about basic first aid, hypothermia, and treatment for sunburn and insect bites. This would leave the instructor with the responsibility for "setting the stage" with a brief discussion on being safety conscious at all times.

1. Clothing examples for hot, cold and wet outdoor activities.
2. Several types of boots, waders and hip waders, and a belt to use with waders.
3. Insect repellents, sun blocks, sea sick pills and sunglasses.
4. Several different types of PFDs.
5. An orange, large fishhook and a loop of string for hook removal demonstration.
6. First aid kit.
7. Photocopies and overhead transparencies of graphics from the appendix.

TEACHING STRATEGY

Lesson Content Outline

Classroom Procedure

I. Introduction

1. Introduce students to the lesson objectives.

II. Weather Considerations

2. Introduce your guest speakers to the students and the topics each will cover.

- A. Lightning
- B. Wind and Storms
- C. Flash Floods, Reservoir Releases, Low Dams

3. Lead a brief discussion on the need for thinking “safety” at all times, especially when outdoors. Topics to mention will vary by geographic location, but can include:

- (a) weather considerations including lightning, wind storms, cold and heat,
- (b) use of PFDs,
- (c) reservoir releases and low dams in rivers,
- (d) safe wading,
- (e) insects
- (f) sun glare, and
- (g) fishing with a partner.

III. Clothing and Protection

- A. Clothing
 - 1. Basic Clothing Items
 - 2. Caps and Hats
 - 3. Gloves
 - 4. Footwear
 - 5. Rain wear
- B. Other Protective Items
 - 1. Sunglasses
 - 2. Insect Repellent
 - 3. Sun Block
 - 4. Sea Sick Prevention

4. Introduce the sporting goods dealer to demonstrate clothing, caps, gloves, boots, PFDs, rain gear, waders, etc.. He should be instructed to discuss layering clothing, clothing for special situations, safe wading, PFDs for different purposes, and protection from the elements, including the sun and rain. The dealer might also relate some “real-life” situations and how they were dealt with. The various types of special materials used in the clothing could be identified and their advantages and disadvantages should also be included. Students should be allowed to touch the various garments.

IV. Safety Around Water

- A. Wading
- B. PFDs
- C. Swimming
- D. Reach-Throw-Row-Go
- E. Hypothermia

5. If a representative from a Rescue Organization, Ambulance, or St John’s Ambulance is available, he/she could also discuss life saving techniques and the reach, throw, row, go concept.

V. Basic First Aid

- A. Hook Removal
- B. Cuts and Bleeding
- C. Sunburn and Insect Bites
- D. Other Medical Problems

6. Introduce the doctor, nurse, paramedic, of St John’s representative to talk about the basic first aid, including:

- (a) hook removal techniques, including when, and when not, to attempt hook removal,
- (b) how to treat minor cuts, stab wounds, burns, bites, and other injuries, and when to seek medical attention,
- (c) heat stroke and hypothermia, and what to do about it immediately, and to encourage medical assistance if it is available.

7. Conclude the lesson by emphasizing the importance of thinking “safety”.

INTRODUCTION

Fishing is not a dangerous activity, but certain precautions must be taken to avoid dangers. This can include use of adequate clothing, especially protective items designed for the outdoors to cope with heat, cold and inclement conditions. Proper protection is also suggested to guard against sunburn, insect bites, sun glare and sea sickness.

Weather is a big consideration for any outdoor activity and particularly for recreational and sport fishers. Lightning, storms, the sea breaking across rocks, high water and fishing below dams can present real dangers. Knowing about these dangers and how to avoid them are necessary for safe fishing.

Safety around water involves wearing and being knowledgeable about personal flotation devices (PFDs) when fishing from boats, from the rocks or in certain wading situations. Swimming skills are helpful, and life saving rescue techniques should be known and practised.

One major, yet seldom realized, danger is hypothermia. Hypothermia can occur even during mild weather.

First aid is an important skill for everyone. Anglers should be well versed in the proper action to take for embedded hooks, cuts, and other first aid problems including sunburn, insect and snake bites.

NARRATIVE

Clothing

Clothing will protect from injury, insulate to preserve body heat in cold weather, provide a method of cooling in hot weather and keep anglers from getting wet and chilled in inclement weather. While ordinary clothing will serve for fishing, it should be serviceable and sturdy. Because the dangers of skin cancer from prolonged exposure to the sun are becoming increasingly apparent, complete coverage is recommended, especially when fishing during the summer or in tropical areas.

Long pants and long sleeve shirts can be rolled up if desired for short periods, but short pants and short sleeve shirts cannot provide complete protection.

For summer or hot climates, lightweight clothing is best, in light colours that will reflect the heat, unless the fishing conditions require camouflaged or dark clothing to keep the fish from spotting the angler. Even in warm climates, carry an extra jacket, sweater or rain parka. Often fishing trips begin early in the morning when it is still chilly, and end late in the evening when it again becomes chilly after the heat of the day.

For fishing in cold weather, experienced anglers agree that layering is the best protection since layers of clothing can be added or taken off as required. For very cold weather, long wool or synthetic underwear helps to maintain body heat as will wool shirts and warm pants. Additional layering can include shirts, sweaters, down or synthetic vests or jackets, all covered with a rain parka. Rain parkas are good not only for inclement weather, but also for retaining heat, especially on windy days.

Beanies, caps and hats prevent loss of body heat (estimates indicate up to 30 percent of body heat is lost through the head/neck area).

For protection from glare from the water and from the overhead sun, Arab style hats or broad brimmed hats provide the best protection from glare and sunburn. The best hats are also light coloured to reflect heat. Baseball style caps are lightweight, can shield the head from the sun and have a bill to protect the eyes from glare but, they are less than ideal as they offer no protection to the side of the face, the ears or the back of the neck.

Balding men should avoid the popular mesh style caps in summer since these will allow severe sunburn of the scalp. Some caps offer "Lawrence of Arabia style" back flaps to prevent neck sunburn. The best hats are those with dark under brims to minimize glare from the water. Hats or caps for winter should be capable of protecting large areas of the head, including the ears from the cold. Good

choices are down, or synthetic insulated caps or hats, and the wool roll down knit Navy-style "watch cap".

Gloves.

Fishing and gloves seem almost incompatible when it comes to hand protection. However, there are gloves that allow the angler to tie knots, handle tackle, hold line for casting, get the hands wet, and to land fish and avoid line cuts while providing sun protection for the back of the angler's hands. Good choices include the lightweight plastic or rubber gloves or hunter's gloves that have flaps for exposing fingers. Angler's gloves that have all five finger tips exposed for fishing tasks, are also good.

Boots.

For summer wading, a pair of high top sneakers is ideal. Low sneakers with a boat or deck sole are best to prevent slipping when boat fishing. Aluminium or steel cleats or spiked boots are needed for working on many rock formations to gain a firm grip on slippery weedy surfaces. Ribbed or spike cleats are necessary over hip boots or waders for much stream trout fishing. When rock fishing, wear solid footwear that will protect your feet and that will help you to move quickly. Do not wear thongs.

Waders and hip boots are designed to keep anglers warm and dry. Hip boots come up to the hips and are held in place with belt straps. Waders are best when they come all the way to the armpit to provide the maximum protection during surf fishing, wading in trout streams or deeper water. Both hip boots and waders come in boot foot (molded-on boots), or stocking foot waders. Boot foot waders are self-contained, heavier and are less of a nuisance. Stocking foot waders must be used with heavy over boots or sandals.

Wind and Storms.

Storms and high winds are dangerous for all fishing. If at all possible avoid fishing on stormy days or in high wind conditions. Wind will quickly create dangerous waves. Some boats, such as canoes and flat prow punts, are ill suited for any storm, wind or wave conditions. Get off the water, or if this is impossible,

face the boat into the waves and try to ride out the storm. If anchored, extend the anchor line to its full length.

Flash floods, reservoir releases and low dams can also cause problems on rivers. Storms and rains, in particular, can cause rising waters, flooding, and swift, dangerous currents. Serious conditions can exist during calm days when fishing on rivers below hydroelectric dams, since a release of water for electric power will cause dangerous waters. This is equally dangerous to boaters, as well as to wading anglers who can become caught in rising water on small islands or spits of land, or those who are unable to fight the current even in shallow water to get back to the safety of the shore.

Low dams across rivers are also dangerous for boat anglers fishing below them. As a result of the hydraulics involved, these dams often cause upstream currents to pull small, drifting boats to the dam and under the falling water, thereby sinking the boat. Often underneath these same dams are large snags that can hold and drown anglers, or form hydraulics which prevent swimmers (even those wearing a PFD) from reaching the surface. Particular caution must be used when wading and boating under these conditions.

Safety Around Water Wading.

Wading requires particular caution by fishermen, whether in still or running water. Several basic rules apply for safe wading. It is important always to know the water, and water conditions, under which wading will be done. Knowledge of the bottom, water depth, slippery rocks, holes, current and similar conditions are mandatory. Wading with a partner and wearing a PFD or some sort of flotation vest or device increases angler safety. While PFDs are not legally required in most areas, many today have pockets for carrying tackle and are comfortable to wear. In addition, various inflatable flotation devices and vests, while not the approved standard for boat use, as PFDs, they are available for wading anglers.

High top wading boots or shoes should be worn for ankle protection. Long, lightweight pants are suggested for protection against saltwater jellyfish and sea nettles, fresh water snags and rocks, as well as for sun protection. Hip boots or waders are best for wading in winter to protect against the chill of the water. Insulated boots are available for extremely cold weather wading.

State laws and regulations require the angler to carry Personal Flotation Devices (PFDs) of an approved standard at all times when boating. The regulations generally require one wearable PFD for each boat passenger, along with a throwable cushion or ring for boats of a certain size and designation. PFDs are rated by type.

A Type I has the maximum flotation, is designed for rough waters and will turn an unconscious person's head and face up to prevent drowning. It is reversible for quick wearing and is available in adult and child sizes.

A Type II PFD will also turn the wearer to a vertical and slightly backward position to prevent the unconscious from drowning. It comes in three sizes but does not give the long term protection and flotation that the Type I does.

A Type III PFD is the type generally sold for recreational use and favoured by anglers. It frequently has pockets to double as fishing vests. It will maintain a face-up position but will not turn an unconscious person to this position. Many sizes are available in vest and jacket styles.

A Type IV PFD is designed to be grasped, not worn. It includes flotation cushions and rings and is designed to be thrown to a person who has fallen overboard.

All PFDs, with the exception of type IV, help to maintain body heat in the water, and thus help in preventing or minimizing hypothermia.

Swimming

All anglers should know how to swim. Many like swimming as an adjunct to family fishing trips and picnics. Since swimming in these circumstances is not under the controlled situation of a regulated beach or pool, special precautions are necessary. Do not swim if you have any doubt as to your ability or endurance. Practise all basic swimming safety procedures: do not dive into the water; do not drink alcohol and swim; do not swim after a heavy meal. Swim only when an experienced swimming partner is in the water or nearby. Do not swim in cold water since hypothermia can result.

Throw-Row-Go.

This refers to a method of rescue response when any person is lost overboard or a swimmer or angler finds himself in trouble in the water.

The first response procedure should be to throw a life saving device to him where this is possible. This should be a type IV PFD such as a ring or cushion, preferably on the end of a rope. Lacking this, any floating object such as a cooler, ski belt or beach ball will help.

If that form of response is not possible, row a boat to the person, preferably with an assistant in the boat to help pull the person over the stern and into the boat. If using a motor powered boat, the power must be cut before reaching the person to avoid prop injuries. Do not allow the person to try to pull himself into a small boat over the side since it might overturn.

Only an experienced lifeguard or a person with life saving training should attempt to go in the water after the person. Drowning people will often panic and can hamper, injure or even drown their rescuers.

Hypothermia.

Hypothermia is the chilling of a person beyond that person's ability to re-warm the body. The first sign of hypothermia is shivering. If not corrected, chilling of the body core causes weakness, hallucinations, uncontrollable limbs, and finally, unconsciousness and death. Part of the body's protection is to sacrifice the blood flow and maintenance of body heat in the limbs to protect and maintain body heat for the internal organs and brain. One fallacy is that hypothermia can occur only in cold weather. In fact, it can occur in almost any temperature once the body begins to get cold or chilled through rain, wetting or wind.

To prevent hypothermia, dress warmly, carry spare clothing, keep the head warm, and use a waterproof parka or rain gear to protect against loss of body heat due to rain and wind. To treat someone with hypothermia, completely remove the wet or cold clothing and replace with warm clothing or place the person in a warm bath. The administration of hot, sweet drinks is approved, but no alcoholic beverage should be used. Do not warm the limbs and do not "exercise" the patient by walking. Warming the limbs will often cause increased blood flow to the limbs, resulting in a stroke, heart attack and death. In extreme cases, a warm bath with the arms and legs out of the bath water is ideal. A good substitute is a warm sleeping bag or electric blanket covering only the trunk, abdomen and head. Once it has been determined that a person has hypothermia in any of its stages, immediately call for an ambulance or other medical help. Hypothermia is not a casual concern, as each year many anglers and other outdoorsmen die from its effects.

Basic First Aid

Hook Removal.

Once a hook penetrates the skin past the barb it is not easily removed. Unless penetration is very shallow or the victim is hours or more away from help, removal is best left to professionals in emergency rooms. Never attempt to remove hooks from around the eyes, from the face, from the back of the hands or

from any area where ligaments, tendons or blood vessels are visible. The simplest removal is to cut free the rest of the fishing lure and use a loop of heavy twine (heavy fishing monofilament is satisfactory) around the bend of the hook. Next, hold down the eye and shank of the hook, pressing it lightly into the skin. The downward pressure on the eye and shank of the hook clears the barb and allows it to travel out through the punctured wound. Grasp the mono or twine loop and with a sharp jerk, pull the hook free. Other hook removal methods, including cutting the skin along the path of the hook penetration and forcing the hook out, are best left to professionals. Any hook wound should be followed with a tetanus shot if such protection is not already in effect.

Cuts and Bleeding.

Small cuts are best treated by application of adhesive bandages and antiseptic. Larger or deeper cuts require pressure directly on the wound to prevent excessive bleeding. To do this, use sterile, sealed gauze pads or as an alternative, an unfolded clean handkerchief. In the case of severe bleeding in which an artery or vein has been cut, pressure on the pressure point where the limb joins the body may be necessary as a last resort. For cuts on the arms and legs, the best direct pressure position is at the joint immediately above the cut where the major blood vessels travel over or near the bone. Use direct pressure here to stop the flow of the blood. At all times be careful to prevent too much pressure or pressure for too long. In all cases of serious bleeding, call a doctor, get the patient to a hospital or call the emergency services immediately.

Sunburn and insect bites are best avoided, but sometimes this is impossible. Cooling salves and lotions are the best relief for sunburn. Insect bites can be dangerous and it is estimated that insect stings, primarily from bees, kill more people than snakebites. If you are susceptible to extreme reactions from bee stings, carry specially prescribed injection kits for such emergencies. For most, removal of the sting and the immediate application of an analgesic/anesthetic balm or a paste

of baking soda will help to relieve the pain, reduce swelling and minimize any itching or inflammation.

Other medical problems include heart attacks, snake bites and other rare, but severe, medical emergencies. Being trained and proficient in CPR is recommended for everyone, especially anglers who might need to use this skill. CPR requires special extensive training. Courses and books beyond the scope of this manual are available through the Ambulance, St John's Ambulance or the Royal Life Saving Society.

Snakebites are rare if snakes are not annoyed or trapped. Most snakebites occur from non-poisonous snakes but still should be treated by a doctor due to the possibility of infection. Bites from poisonous snakes are best treated by applying a pressure bandage to the whole limb, keep the patient calm, reduce any

exertion or movement, and get the patient to a doctor or hospital immediately.

Box Jellyfish, Sea wasps, and other marine stingers can inflict particularly severe wounds that, if not treated properly, can prove fatal. Where these creatures are likely to be encountered fishers should carry a bottle of vinegar and some form of bandage. Under no circumstances should you attempt to remove any tentacle still remaining on the skin by rubbing off by hand, cloth, sand or the like as this will usually cause only more stinging cells to release their venom. Douse the affected area liberally with vinegar to wash away the remaining tentacle and neutralize the stinging cells. Use a firm bandage to wrap over and beyond the affected area and then douse the bandaged area with more vinegar. As much as is possible, keep the patient still, comfortable and relaxed until medical assistance is sought.





LESSON 7

SHORE FISHING



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LESSON 7

Shore (Land Based) Fishing

Lesson Objectives

Following this lesson students will:

1. Know that fishing from shore can provide an enjoyable fishing experience.
2. Realise that shore fishing requires little in the way of special equipment or techniques.
3. Understand the advantages and disadvantages of fishing from the shore.
4. Be familiar with how to fish rocks, beaches, banks, piers, jetties, bridges and walkways.
5. Know some safety precautions necessary for shore fishing.
6. Understand the necessity of a careful approach to water when fishing from shore.
7. Realise the importance of gaining permission when fishing from private land and the need for controlling litter,

Materials for the Lesson

1. Examples of the types of tackle utilized by shore anglers in your area. Surf and jetty tackle, and stream and lake tackle.
2. Safety equipment used in local shore fishing: PFDs, cleats, wading shoes, waders, hip boots and insulated boots and shoes. A local sporting goods dealer can be asked to display many of the items in #1 and #2.
3. Photocopies and overhead transparencies of the graphics in the appendix, for classroom use.

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TEACHING STRATEGY

Lesson Content Outline

Classroom Procedure

I. Introduction

1. Introduce students to the lesson objectives. Explain that shore fishing is often called “land based” fishing.

II. Locations

- A. Pond and lake banks
- B. Stream, creek and river banks
- C. Surf Fishing
- D. Rock Fishing
- E. Piers
- F. Jetties
- G. Walkways
- H. Bridges

2. Ask students to relate personal experiences they have had fishing from shore. List these on a chalkboard. As you are discussing this, have students describe the equipment they used. As specific equipment is mentioned, show that equipment to the class. Some students may not be familiar with certain types.

3. Ask the students why they fish from shore. Responses will vary, but weave into the discussion shore fishing advantages

III. Advantages and Disadvantages

- A. Advantages
 - 1. Cost
 - 2. Easy Access
 - 3. Fish Availability
 - 4. Family, Group Activity
- B. Disadvantages
 - 1. Restricted Fishing Area
 - 2. Crowding

4. Discuss the disadvantages of fishing from shore. The concepts of crowding and being able to fish only certain parts of the lakes, etc., may be responses.

IV. Safety

- A. Water Safety
- B. Fishing Safety

5. Safety in all fishing is important, and no less so with shore fishing. Stress the safety aspect by showing several of the safety apparel items available. Describe their use. Ask students if they or their friends or parents have used them and why they think they are important. Continue with other safety aspects concerning the use of equipment and special safety concerns in specific types of shore fishing situations, e.g., rocks, surf, piers, jetties and wading.

V. Tackle

6. In most cases, fishing tackle for shore fishing is no different from that used in other types of fishing. Discuss basic equipment, especially rods and reels. Ask students to tell what type of equipment they use, and why. Discuss the different shore fishing tackle for specific purposes. Surf, pier and rock fishing require specialized equipment. Discuss the most commonly used tackle locally.

VI. Approach to Shore Fishing

- A. Walking Banks
- B. Vibration
- C. Sight Window of Fish

7. Fish are wary creatures. This has implications for bank anglers. They must be careful not to make loud noise while on a bank, to keep a low profile, and not to throw items into the water. Ask students how they can remain disguised while bank fishing. Explain how fish can see through a “window” in the water. The graphic on fish vision may be of assistance here.

**VII. Ethics, Permission,
Responsibility**

8. Much shoreline fishing is done on private property. Ask the students how many of them fish on someone's property. This is a good starting place to introduce ethics, respect for and the rights of others, and the individual responsibility that each of us has to preserve and enhance the resource. Ask those students who have fished on someone else's property to relate their experiences. Work the concepts of asking permission, picking up litter, closing gates, not damaging property and other such ideas into the discussion. Ask all students to suggest ideas they have concerning everyone's responsibility to the resource. Write specific suggestions on the chalkboard.





INTRODUCTION

Fishing from the shore offers unique advantages to the angler. It allows access to a number of waterways, ranging from surf fishing the Pacific, Southern or Indian Ocean coasts, to lake and pond fishing, stream and river fishing, and fishing from man-made structures such as piers, jetties, walkways and bridges.

Shore fishing is available to everyone, allowing for large family and club groups to fish together. It is relatively low in cost as it does not require boat ownership or rental. Safety and tackle concerns, while important, are minimal when shore fishing, but anglers must know how to approach an area to maximize fishing effort. Some specialized shore fishing exists, such as surf and rock fishing that does require special gear.

Anglers must be aware that fish can see through the water to view anglers on a bank and that vibrations from walking anglers will signal danger to fish.

Since much shore fishing in freshwater is done on private property, good landowner relations are a must to prevent loss of access for all anglers. Gaining permission to fish and showing respect for all private property are the keys to being welcomed by landowners.

NARRATIVE

Locations

Millions of anglers fish exclusively from the bank or shore. Fishing from the shore will often control the type of fish caught. Surf fishers do not usually find free swimming ocean species, such as tuna and mackerel, close to the shore. These species are caught only from a few special rocky headlands and platforms. Shore caught freshwater species include those fish that are bottom feeders such as carp, catfish, or those that relate to structure such as yellowbelly. Access to the banks of many streams is restricted by private property.

The big advantage of shore fishing is that almost everyone has some water near

home that will produce good angling. Lakes and ponds provide good fishing. Many of them have shoreline structure such as logs, stump fields, brush, rock piles, rockwalls, jetties, docks and felled trees which provide shelter, shade and protection for fish, and make for ideal fishing spots.

Lakes and ponds also allow for easy movement to many spots along the shore by simply walking or driving to a new location. Often the best spots are those that are out of the way from easy access and roads, since most anglers will fish those closer locations and can temporarily reduce the numbers of fish available. Less accessible areas can often provide better, almost private, fishing.

Streams and rivers are also good locations for fishing, particularly those that have good structure in logs, rocks, islands, sandbars and rock piles within casting distance of the shore. Many anglers fishing shallow rivers will combine shore fishing with shallow water wading. Fishing from midstream in rivers or streams increases opportunities for casting to different structures.

Surf fishing is a specialized type of shore fishing. Anglers fish from the shore or wade into the water along the beach. There is usually little visible structure at which to cast, so anglers must become familiar with "reading" the water to detect gutters, pockets, tide rips and such areas where fish may be present.

The tackle for surf fishing is different from that used for other inland shore fishing since the fish are bigger and the sinkers to hold a lure or bait on the bottom are heavy. Thus, heavy reels are used (with sidecast reels being quite common), spooled with 6 to 10kg line and fitted on long, heavy rods that range from 3.5 to 4.5 or more metres in length. Casts are long and bait is most often used unless fish are visible in the area; in which case lures are often used.

Piers and jetties are elevated structures above the water that extend into the waterway. They can be from a few metres to several hundred metres in

length and anywhere from only a metre to 10 metres or more above the water surface. They allow more anglers to fish a given area and also to get their lures and bait further out into the water than a cast from shore would allow.

Pier tackle is usually slightly heavier than that used for most shore fishing since long casts are a must and the hooked fish must be controlled until a bridge or pier gaff or net can be dropped to land them. Often the pier is built with rock piles or structure adjacent to it, that help hold fish for fishermen. Lacking this, even the pilings of the pier serve as structure to help foster a food chain and to help provide shade and shelter for fish. In these cases, often the best fishing can be right under the pier.

Groynes are similar to piers in that they are built out into the water and provide a platform from which to fish. Most groynes are built to protect harbour areas and boat slipways and ramps from wave action, thus they are built along the shores of larger bays and oceans. Most groynes designed for fishing have the rocks arranged so that they are flat on top for easy walking. Some groynes do not have this feature and require that extreme caution be taken.

Rockwalls (and seawalls) are frequently washed with water from wave action so that cleats are required for safe fishing. Because of their rock base, they provide a good locale for a food chain and shelter for fish.

Walkways are usually specially built fishing platforms that are associated with, or run parallel to bridges, piers, shoreline bulkheads or similar shoreline structures. They are made especially for fishing and are separated from the adjacent structure. An example would be a separate walkway at a lower level along a bridge in order to keep anglers from hooking cars when making casts, to place anglers closer to the water for easier fishing, and to prevent any pedestrian accidents caused by anglers fishing from the bridge.

Bridges are not always open to fishing. Fishing is prohibited from many of them due to high traffic volume, no shoulder area for fishing access, spans that are too high, and lack of good parking access. Bridges that do offer fishing must be fished safely to prevent snagging cars and must have adequate space for anglers consistent with safety and traffic movement and volume.

Advantages of Shore Fishing

Lower cost is the big advantage to fishing from the shore. All that is needed is basic tackle and a shoreline. Admittedly, in some areas, entrance fees are charged for fishing from private property, but these are minimal.

Easy access is another shore fishing advantage. A nearby pond, lake, stream, river, bay or beach can be found virtually everywhere. Boat fishing, on the other hand, often requires boats of a certain size and type to be effective. Some anglers buy several different boats for fishing on different types of water, again increasing the cost of boat fishing.

For a club, several friends, a large family or similar group, the shore fishing experience can be combined with a picnic or family gathering so that all involved enjoy the companionship of a large group. This does not preclude shore fishing from being an individual activity. It does mean that shore fishing can involve large or small numbers of anglers.

Safety

Safety in all fishing is important, no less so with shore fishing. While the dangers and concerns of boat fishing are not involved, safety must still be paramount. This begins with the site selection. Private property must be fished only with permission, not only as a courtesy, but also to be aware of any dangers such as cattle in pastures, planned pesticide crop spraying or mud holes that might bog cars.

Safety also involves the handling of rods, reels, line and hooks to prevent fishing

accidents. Those anglers combining shore fishing with wading in the surf, streams, ponds, or rivers must use caution, preferably wear a PFD, have proper foot wear, and be prepared for extremes of temperatures which can cause hypothermia or heatstroke.

Safety when casting is a must when fishing in and around large groups of people, off of a bridge, off of a pier or jetty, or anywhere people or obstructions might get hooked. Rockwalls and groynes also have some specific concerns. Rocks, because they can be very slippery, must almost always be fished in cleated shoes. Cleat styles vary with different locations but include soft aluminum cleats or strap-on cleats that will cut through any slime or sea weed and grip the rocks.

Surf fishermen also need special equipment, such as waterproof jackets and waders or hip boots, to stay dry along the surf or when wading in the shallows in winter.

Tackle

Tackle for shore fishing is, in most cases, no different from that used for boat fishing under the same conditions and for the same species. Freshwater tackle is usually light for fish like gar and spangled grunter. It is medium for bass, yellowbelly, sooty grunter and jungle perch. Heavy tackle is necessary for large murray cod and barramundi.

When saltwater fishing, medium to heavy tackle is a must. This is not just because of the fish but also for the heavier sinkers that must be cast greater distances and to hold the bait on the bottom against the prevailing currents and tidal run. Surf fishing also requires special accessory tackle, such as sand spikes to hold rods elevated. Other tackle for surf fishermen includes rod belts that hold small landing gaffs, knife, bait boxes, plus a flashlight for night fishing, and fish bags.

Pier fishers often use small carts, that hold extra rods, tackle boxes, bait containers and rod holders, as a means of

transporting their tackle. Rock fishers may also need special cleated shoes.

Approach

Fish are always wary and especially so in shallow water near the shoreline. Thus, shore fishers must walk carefully since bank vibration from walking can be transmitted to the water and scare the fish. Vibration is less a problem when fishing streams since the current covers any bank and shore vibration.

When wading, avoid dislodging rocks that might make sounds that scare fish. It is no problem when fishing from groynes and piers since no appreciable vibration will be transmitted to the water to scare fish.

When fishing still water, anglers fishing close to the shore must also avoid being seen by the fish. Fish near to the surface can see through the water surface by a "window" that refracts the picture so that a cone of vision is possible. As a result, anglers fishing close to the shore should stay low to avoid being seen, stay near shrubbery to remain disguised, or wear dull or camouflaged clothing to hide from the fish.

Ethics and Permission

Much shore fishing is on public property owned by the State or Federal Government, but much is done on private property owned by an individual or a business organization. When fishing on public lands, such as national parks, anglers sometimes need permits to control access or reduce crowding. When fishing from private property, permission is necessary from the landowner. Before fishing on known or suspected aboriginal or islander tribal lands always obtain the permission of the indigenous community where that is a mandatory requirement, but otherwise obtain it simply as a sign of respect. In all cases the best permission is a signed slip giving permission to fish on the property, either on a recurring basis or for a specific time period. However, verbal permission is usually satisfactory. When gaining permission, be sure to pay attention to any specific

requests or regulations of the landowner. Common requests include making sure that all gates are left as they were (open or closed, as the case may be), avoiding crops to prevent damage, causing nuisance to stock and staying away from any restricted water areas.

Ethics also requires that all fishing areas are left cleaner than when found. It is advisable to take a garbage bag with you when you go fishing so that you can

remove all litter, even that litter you have not caused. Take only those fish permitted by the landowner. Even if State regulations are more liberal than the landowner's limits, respect and common sense indicate that the lesser limits be honoured to assure being invited back. It is considered "good form" to offer a fish or two to the landowner "host", and if accepted, it is also "good form" to present the fish cleaned or filleted.

