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February 1976 • 50¢



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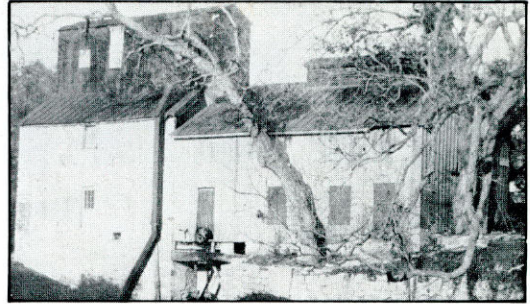
Dedicated to the conservation and enjoyment of Texas fish, game, parks, waters and all outdoors.

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Published monthly by the Texas Parks and Wildlife Department, John H. Reagan Bldg., Austin, Texas 78701, AC 512-475-2021. Republication of material is not permitted except by special written permission. The inclusion of advertising is considered a service to subscribers and is not an endorsement of products nor concurrence with advertising claims. Rate schedule available upon request. Subscription rates: \$3.15 for one year and \$5.25 for two years. Single copies and all back issues, 53¢. Prices include 5 percent sales tax for Texas residents. Foreign subscription rates: \$4.00 for one year, \$7.00 for two years.

Postmaster: If undeliverable, please send notices by form 3579 to Reagan Building, Austin, Texas 78701. Second class postage paid at Austin, Texas, with additional entry at Oklahoma City, Oklahoma.

February 1976, Vol. XXXIV, No. 2



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Front Cover: Eastern and western meadowlarks are almost identical; however, the western species is paler and the yellow of its throat patch nearly touches its cheek. In the field they can be distinguished by their different songs. Photo by Jim Whitcomb.

Inside Front: Canada geese can easily be identified by their white "chin strap" markings. Our photographer found these at the Gambill Goose Refuge near Paris where daily feeding operations from mid-October through March attract the wild birds for closer observation by the visiting public. Photo by Leroy Williamson.

ABOVE THE SURF

Article and photographs by Buddy Gough, Information Officer, Beaumont

Saltwater fishing piers cover but a minute part of the vast waters of the Gulf of Mexico, yet the 200 or 300 yards of surf under each pier are literally teeming with marine life.

Within the area a feeding cycle operates on a food chain stretching from the microscopic to the massive.

Almost invisible marine organisms attract shrimp, crabs, mullet and other small fish such as yellowtails and piggy perch. These in turn lure redfish, speckled trout, Gulf trout, sand trout, Spanish mackerel, croakers, whiting, sheepshead, drum, gafftopsail catfish and pompano. These fish may, at times, bring in jack crevalle, sharks, tarpon and huge manta rays.

At one time or another during the year all of these fish species are within easy reach of the pier angler who is resting comfortably a few feet above the water. However, few of the thousands of anglers who fish from a pier ever truly exploit the potential of the water beneath them.

Many pier fishermen simply trust to blind chance—they arrive at their whim, walk out on the pier, sit down and start fishing with whatever tackle they have available.

If they happen to hit everything just right, they fill up their ice chests — and this happens often enough to keep them coming back. But, more than likely, they will catch only a few fish or nothing at all. Blind chance is like that.

On the other hand, experienced pier anglers consistently catch fish. They do it year around, succeeding too often for it to be simply blind chance.

The successful pier fisherman knows when to go fishing, what to fish for according to the season and how to fish for it. In short, he has mastered the relatively simple art of pier fishing, and chances are he has his pier fishing year already planned.

Right now, he is catching Gulf trout, sand trout and whiting on those calm winter days when the surf is clear and flat.

In a few weeks, he will come to the pier to catch the big black drum that

move through the surf in late winter or early spring on the way to their bay spawning grounds. He will arrive armed with a stout rod and reel because he knows 40- and 50-pound drum are commonly hooked from piers.

Then, as the month of April draws near, he will expectantly await the arrival of big “sow” speckled trout in the surf. This is the premier event for the pier angler and, once the “run” is in progress, he will keep a constant vigil for a calm, clear surf accompanied by a high incoming tide, and race to the pier with his bait-casting tackle when these conditions occur. If he wants to play the most favorable odds, he will bait up with live shrimp or, if he likes to keep things simple, he will use a variety of jigs, spoons and trout plugs.

In the hot stillness of summer, he will fish the cooler periods of the day for speckled trout, pompano and Spanish mackerel with bait-casting tackle or, using heavier tackle, he will angle for the heavyweights of summer — sharks, tarpon and jack crevalle.

By late summer, he will be keeping watch for the start of the bull redfish run along the surf. For many devout pier anglers the fall run of the bull reds overshadows even the spring speck run.

Since redfish usually prefer high tides and a rough surf to move close to the beach, he may fish just before or after a hurricane in hopes of hanging a bull red. Often he will spend hours of the day and night on the pier, his long surf rod propped against the rail, a heavy sinker anchoring his cut mullet in the booming surf, waiting for the screech of his reel to signal the strike of a bull red.

If bull red action gets a little slack, he will use some light tackle to cash in on some good croaker fishing.

Finally, by the time winter arrives again, he will be back to filling his stringer with Gulf trout, sand trout and whiting.

Such is the way the successful pier angler conducts his art.

You can do the same by following his example.

Just a glance at his fishing calendar



Piers provide access to year-round fishing pleasure.



reveals several factors to account for his success.

For one, the experienced pier fisherman gears much of his fishing activity to the habits of various species of fish. Water temperature, the prevalence of certain forage fishes, the spawning urge and movement patterns all influence the presence of various fish species in the surf during the year. Through experience, the dedicated pier angler learns the most favorable time for every fish.

However, for the casual pier visitor, the above description of the pier angler's calendar can be used as a general guide to plan fishing activity.

But the dedicated pier fisherman does more than organize his fishing around the seasonal habits of fish. Rather than just narrowing an outing down to a season, or a month or a day, he narrows it down to an hour.

This leads to a second factor affecting pier fishing excellence — tides.

Tides trigger the vast food chain or feeding cycle described in the beginning. The movement of water stirs up the sand and the minute organisms on which the shellfish and small bait fish feed, on which the larger fish feed. The tide simply starts an avalanche of feeding activity.

Slack tide, no water movement at all, is generally a poor time to fish the surf.

Fish usually feed best before and after a tide change — generally a period of two hours or so. Therefore, the experienced pier fisherman closely watches tide schedules and plans his trips accordingly.

Anglers should particularly look for the strong tides — the higher-than-average incoming tides and the lower-than-average outgoing tides. Generally, the new moon and full moon coincide with these stronger tides.

After tide, wind has the next greatest influence on pier fishing. A wind blowing in the same direction as an incoming tide will help clear the water and enhance fishing. A cross wind or a strong wind from any other direction will muddy the surf and retard the benefits of the tide.

On the Texas coast a gentle south wind is best, and no wind or a slight north wind is not considered bad. However, an east or west wind usually means trouble if you are after fish such as speckled trout and Spanish mackerel that prefer clear water.

About the only time a rough surf works to advantage is during the fall redfish runs.

Knowledge of the seasonal habits of fish in the surf, attention to tide



schedules and wind direction are all used together by the veteran pier angler to pinpoint the time of his arrival at a pier.

Once on the pier, the angler does not randomly select a spot from which to hang out his line. On the contrary, the wise pier fisherman has one other factor in his favor — he knows the terrain beneath the pier.

The surf bottom beneath the pounding waves is not featureless. Rows of sandbars running parallel to the beach follow each other in neat order out from the shoreline. Between these sandbars are narrow troughs of deeper water. The troughs or guts between sandbars are in effect "highways" along which fish travel in the surf.

The average surf pier crosses several of these guts that start just a few yards from the shoreline. The knowledgeable pier angler knows where the guts are because it is in this deeper water that the majority of the fish will be caught.

These guts are not hard to spot since the wave action reveals their location. As the waves move toward the beach, they break on the shallower water of the sandbars and gather strength in the deeper water of the guts.

Since the areas in the surf where the waves aren't breaking indicates the guts, the angler can easily mark their location in relation to light poles on the

pier or by pacing off from some designated spot.

As a tide moves in, fish move in with it, moving into guts closer to shore as the tide rises; reversing the process as the tide falls.

While there will be some fish in all the guts during the movement of a tide, an angler should work the guts from the end of the pier toward the shore on the incoming tide and to the reverse with an outgoing tide. The main thing is not to stay rooted in one spot on the pier — move where the action is as long as it can be done without impeding other anglers.

Besides knowing the factors governing when to go pier fishing and where on the pier to fish, the experienced pier angler knows how to match his tackle and fishing technique to the type of fish he is after.

Since the majority of the fish caught from piers are one- to two-pounders, most bait-casting reels and spinning reels filled with 10- to 20-pound test line will suffice. But as the size of the fish increases, so do the tackle requirements. For bull reds, big drum, jack crevalle and sharks less than 100 pounds, an eight- or 10-foot rod is necessary both to wear down the fish and to handle it in case it makes a lunge for the safety of the pilings; attached to the rod should be a reel with the capacity to hold 250 yards

GULF FISHING PIERS

Pier	Location	Length	Fees
Shorty's Longest Pier	Bolivar Peninsula Two miles from High Island on Highway 87	1,550 ft.	\$1.00 for adults 50 cents for children 12 hours from time of purchase of ticket
Gulfhaven Pier	Bolivar Peninsula One and one-half miles North of Gilchrist on Highway 87	1,400 ft.	\$1.00 per period 6 a.m. - 6 p.m. 6 p.m. - 6 a.m.
Flagship Pier	Galveston Island 25th and Seawall Blvd.	1,475 ft.	\$1.50 12 hours from purchase of ticket
61st Street Pier	Galveston Island 61st and Seawall Blvd.	440 ft.	\$1.25 per period 6 a.m. - 6 p.m. 6 p.m. - 6 a.m.
Gulf Coast Pier	Galveston Island 90th and Seawall Blvd.	440 ft.	\$1.50 per period 6 a.m. - 6 p.m. 6 p.m. - 6 a.m.
Galveston Rock Groins Beach Stabilization Structure	Galveston Island 10th and Seawall Blvd. 17th and Seawall Blvd. 29th and Seawall Blvd. 37th and Seawall Blvd. 61st and Seawall Blvd.		Free - Operated by Galveston County
Fisherman's Wharf	Surfside Beach Two miles north of Freeport Jetties	1,000 ft.	\$2.00 Adults \$1.00 children 12 hours from purchase of tickets
Horace Caldwell Pier	Port Aransas	1,066 ft.	Free - Operated by Nueces County
Bob Hall Pier	Padre Island One and one-half miles North of Nueces-Kleburg County line - Park Road 22 from Corpus Christi to Padre Island Park	800 ft.	Free - Operated by Nueces County
Gulfside Pier	South Padre Island Andy Bowie Park Six miles North of Jetties	180 ft.	\$1.50 - Sunrise-Sunset \$2.00 - Sunset-Sunrise

or so of 30- to 50-pound test line. Line capacity is especially important in pier fishing since the angler can't move to keep up with the fish.

The terminal tackle used in pier fishing is relatively simple. In most instances, a simple bottom rig with hook and lead sinker will do; hook size and heaviness of the sinker should match the size of the fish the angler is after and the kind of surf conditions in which the bottom rig will have to be anchored. The use of a steelon leader in pier fishing is generally a good idea due to the abrasive qualities of sand, shell and barnacles as well as the sharpness of the teeth and gill covers of marine fish.

The most commonly used and most readily available bait for the smaller surf fish is dead shrimp; for the larger fish it is whole mullet, menhaden and Gulf trout or cut portions of the same. Live bait is often more effective than dead

bait, but anglers generally must transport live bait to the pier themselves or catch it from the pier with a cast net.

Along with spare fishing tackle, the wise fisherman will include a pair of pliers in his gear. That scourge of the seas, the seacat or "hardhead," is common in the surf, and its poisonous, needle-point fins make it dangerous to handle until the fins have been snapped off with the pliers.

Since it is risky to hang a stringer of fish around the pilings of a pier, the smart fisherman carries an ice chest for his catch. The freshly-iced fish will not only be safer, but their eating quality will be preserved. The chest also makes a comfortable pier seat.

A long-handled landing net is another good item to have along. The body weight of a three-pound speck is enough to rip the hook from its mouth if the angler attempts to lift the fish all the

way to the pier with his tackle. Some piers furnish the long-handled landing nets needed by their customers; however, if such nets are not available, one can be easily made by attaching a 10-foot pole to the handle of a regular landing net. In the same manner a pier gaff can be produced when the angler is after fish of the size to require gaffing.

The final thing to learn in the art of pier fishing is consideration for fellow fishermen. Experienced pier fishermen won't crowd other anglers or fish over their shoulders. Nor will they litter the pier with hardheads other anglers might step on. They will look behind before raring back to make a cast and they will avoid those roundhouse swings with a rod and thus lessen the risk of burying a hook in some unsuspecting angler. In short, the experienced will act as if all those on the pier are passengers on the same fishing trip. **

WINTER DIVING

Article and photographs by Edmond S. Alexander,
The University of Texas Health Science Center, Dallas
and M. Samuel Cannon,
The University of Texas Medical Branch, Galveston

Winter months for outdoor zealots can be long and bleak, especially if you're one of the thousands of scuba divers. Autumn cold fronts harken early retirement of masks, fins and snorkles as water temperatures drop across Texas. By mid-November only the diehards remain, as summer's spiffy aquanauts dwindle to a handful. Cheer up! Winter can mean better diving and, when a fellow devotee asks if you'd like to tank dive a flower garden in winter, take him seriously; he's not suffering from nitrogen narcosis.

On the edge of the continental shelf, 110 nautical miles SSE of Galveston, is the most exquisite flower garden imaginable — the Flower Gardens Coral Reefs, and it grows year around. The Flower Gardens, once believed a dead geological relic, is alive and thriving as the northernmost living coral reef in the Gulf. In fact, the Flower Gardens Ocean Research Center (FGORC) in Galveston and Texas A&M University conducted a joint research project from 1970 to 1974 in which over 300 marine species (including more than 100 fish and 18 coral species) were identified within the reef, many previously unreported in the Gulf.

Whereas Caribbean "mother reefs" possess branching corals, the Flower Gardens has none. It is almost exclusively hard coral, such as *Montastrea*, *Porites* and *Diploria*. These three genera of building



Dick Mason

corals construct the huge scleractinian structures called coral reefs. At the Flower Gardens, dead coral is estimated to compose approximately 60 percent of the structure, which is considerably higher than for many Caribbean reefs. These older estimates may require updating as recent dives show numerous areas of the reef entirely covered by living coral.

One might question how a delicate coral community survives the upper Gulf's chilled winter waters created by the infamous "blue northers." Even during the coldest months, the Flower Gardens' subsurface water temperatures remain between 68° and 72° F. as warm tropical currents feed directly over the reef and facilitate winter coral growth. Water clarity, another prerequisite for reef development, is virtually unlimited all year at the Flower Gardens. In fact, increased visibility (100 to 200 feet) occurs in winter months. Thus, clear water and mild temperatures afford perfect diving conditions.

Divers (opposite page) are attracted to one of several large sand beds found atop the West Flower Garden Bank. Edges of these sand beds attract multitudenous marine species that may be photographed or collected. A school of brown and blue chromis (below) dart among a reef's coral head. Presence of blue chromis in the Gulf of Mexico was first documented by this picture.

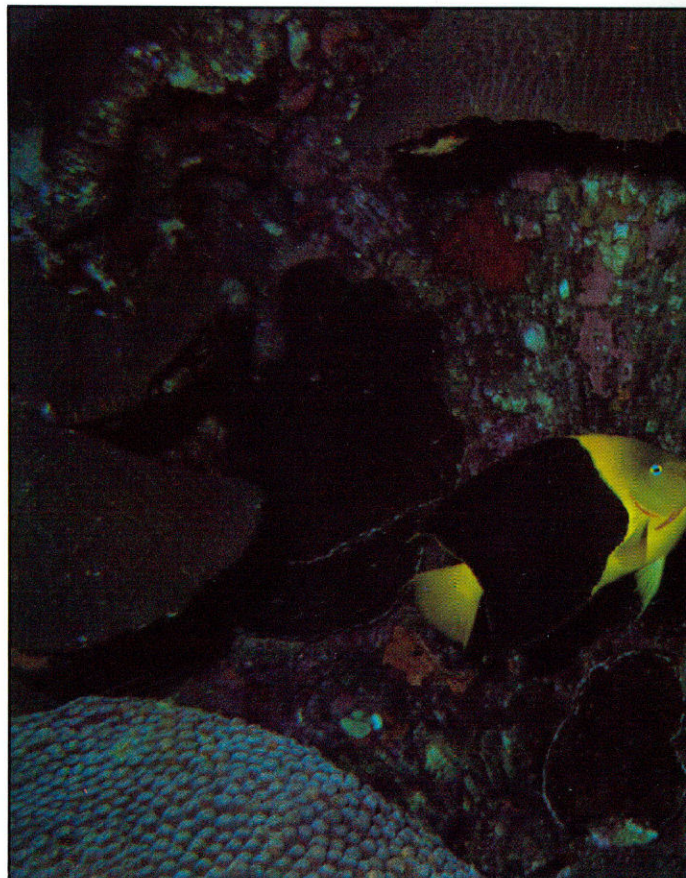


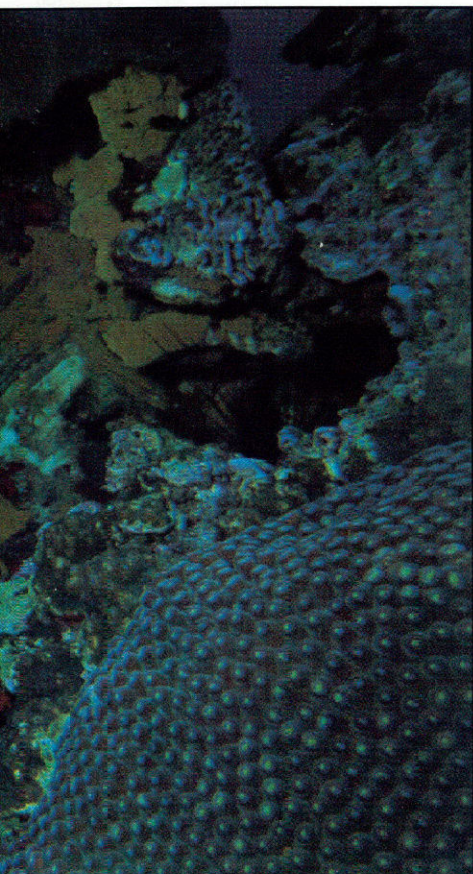
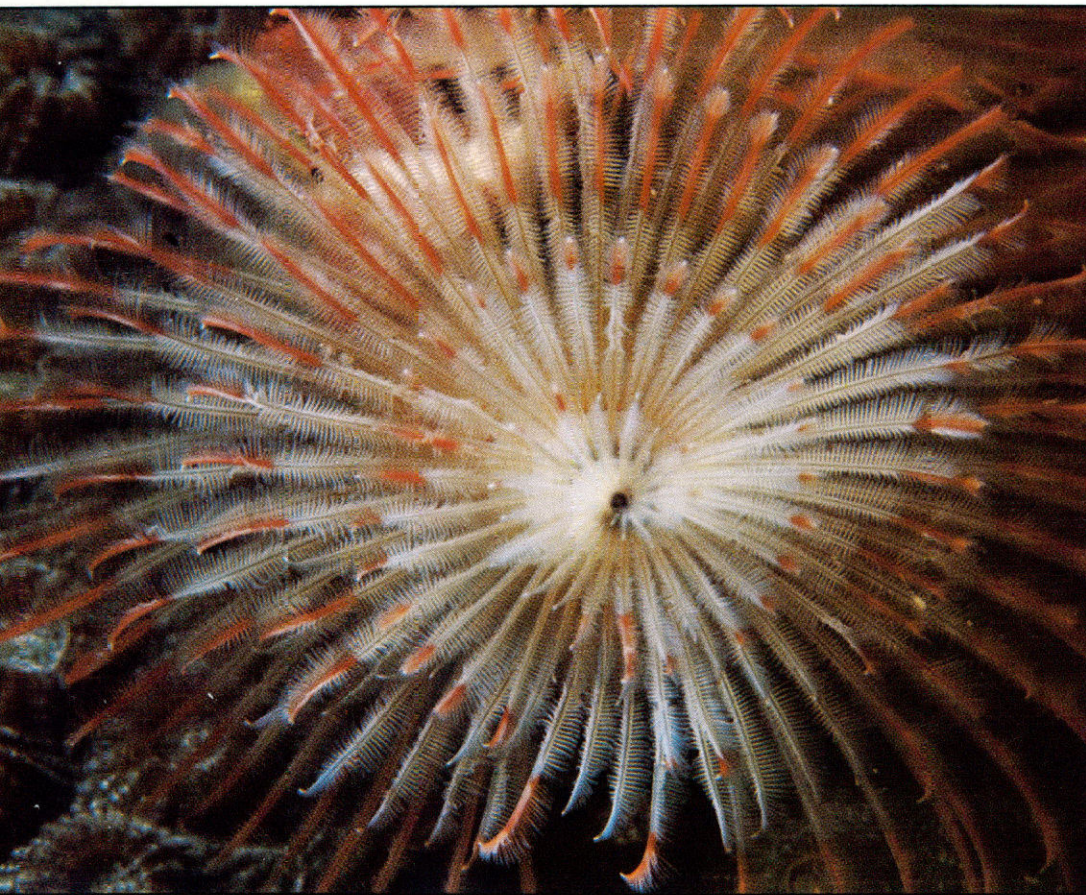
For the venturesome, transparent waters mean incredible night dives. A full moon or shipside lights directed toward a reef offer sufficient illumination for nocturnal exploration. As your eyes accommodate to the eeriness atop the reef, you can observe the multitudinous tiny crustaceans which emerge to feed under the safety of darkness.

The Flower Gardens consist of an east and west bank. The west bank is slightly deeper than the east; it has a more diversified tropical fish population, with the top of the reef 65 to 110 feet below the water's surface. In contrast, the east bank, approximately 40 miles from the west, is shallower, with the reef's pinnacle 45 to 80 feet underwater. The last trip to the east bank by FGORC disclosed the shallowest portion of the reef to date is only 35 feet from the surface. Here, the scuba diver can see exotic fish, such as queen and French angels, reef butterflies, rock beauties, parrot fish and sundry species of damsels and wrasses. Moreover, game fish including dolphin, mackerel, billfish, record-size amberjacks and countless barracuda are present, as are large schools of snapper and grouper which populate the reef's lower levels (165 to 350 feet).

Exploring the Flower Gardens is open-ocean and largely deep-water diving. Safety precautions for scuba must be rigidly followed; the novice and those inexperienced in ocean diving should gain expertise by diving around the many oil rigs which dot the Texas coast. Also, a seasoned ocean diver should accompany all trips, using a boat of considerable size in the event of a "blue norther." Although construction of oil rigs near the East Flower Gardens is reported, loran and Fathometer are essential in locating reef structures.

In winter a full wet suit is recommended; however, a suit top and blue jeans are sufficient. Protective clothing is necessary year around because of abrasive corals and rocks. Cold weather needn't limit diving; visit the Texas coast. From here it's just a short hop to the Gulf's wonderous Flower Gardens. **





Coral polyps, such as the extended Montrastrea's polyps (top left), open at dark to feed. High magnification reveals the intricate detail of the branchial and filter apparatus of this marine worm (above). These worms number in the millions at the Flower Gardens. This photo (left) documents the presence of the tropical rock beauty, Holacanthus tricolor, at the West Flower Garden Bank.

BEFORE YOU GO DOWN

Learn to dive the safe way through a diving certification program.

Bill Reaves



by Don Szatynsky

No one really knows how many individuals are sport diving without having completed one of the nationally recognized training or certification programs. A conservative estimate suggests that at least one fourth of all divers are uncertified. Some, who were certified long ago, have not actively pursued diving, so for all practical purposes they also can be placed in this category. At one time, I belonged to the uncertified group.

I have been diving for a number of years and always considered myself to be a good, safe diver. However, until recently, all my diving had been limited to Florida and other tropical waters. Upon arriving in Texas with its colder inland waters, I decided to sign up for a certification course.

During the first few classes, I felt superior to the poor landlubbers who had never even had a mask on, much less seen the beauty of the coral reefs. They were now trying to enter into that exclusive world of Jacques Cousteau, Mike Nelson and the rest of us "hero divers." These feelings of superiority lasted until we started talking about decompression tables, breathing rates and medical symptoms. Then I started having second thoughts about some of my previous adventures such as diving to 80 feet with a small, 38-cubic-foot tank and no pressure gauge; or skip breathing to extend the time underwater; or worse yet, snorkeling continuously for six hours without a life vest. As a result, I was able to very quickly discredit the old saying that "you can't teach an old dog new tricks."

Following this shock to my "hero diver" image, I was jolted again by our first open-water check-out dive. To understand the profound impact of this situation, you have to imagine the setting in which we found ourselves: a desolate quarry in midwinter, a surface-water temperature of 42° F. and

a cold wind trying to work its way into our wet suits. I was hard pressed to remember that I was doing this for pleasure and of my own free will.

Our first dive was to a platform suspended from four barrels at a depth of 30 feet where visibility was limited to about six feet. I was separated from my diving buddy within the first minute of our descent. Here our training became valuable and instead of wasting time and air looking for each other, we surfaced within seconds of one another. We then decided to use one of the cables to guide us to the platform.

By this time I was conditioned to the cold water and the descent was uneventful. However, once we hit the platform and had a chance to look around, things were a little different. Visibility being what it was, it finally occurred to me that I was really in an alien environment. I also realized that within seconds this situation could become dangerous and that my safety depended on the training (both practical and theoretical) I had received during my certification course. I quickly ran through several mental check lists and this ritual restored my confidence. This experience was as foreign to tropical diving as race car driving is to walking.

Several other divers from our class joined us on the platform, and after practicing clearing masks, inflating buoyancy compensators and buddy breathing, our instructor gave a prearranged signal that meant he wanted us to go off the platform for a bounce dive to the bottom. Prior to the dive, we had agreed to try this, only if both buddies felt comfortable and were not having any problems.

Four of us went over the edge of the platform and started down. Our instructor had a reel with a line attached to the platform. As we slowly sank down, each thermal layer we passed became another step into the unknown. The light grew dimmer and my eyes strayed more often to the white umbilical cord

that led back to the world of sunshine.

At 80 feet we hit bottom. Visibility had disintegrated and it was almost impossible to read the depth gauge. The cold was more intense and I could only vaguely make out the shapes of my companions. It was then I began to have some understanding of the feeling of loneliness and danger, interwoven with excitement and challenge, that the astronauts must experience. Again, I thought of diving in the tropics and the overwhelming sensory experience of colors, fish, coral and light. This, on the other hand, was a sensory experience turned inward; I had never been as aware of my breathing, the beating of my heart, the various pressures within my body and the tenuous thread on which my life depended.

I was relieved when our instructor finally gave the thumbs-up signal for the ascent, although I felt regret for not being able to stay longer. Going up seemed much longer and farther than I remembered, and the platform, when we finally reached it, looked like home. From there, it was just a short distance to shore, a cup of hot coffee and excited exchanges of our experiences.

As a result of this check-out dive, I have become a safe diver instead of a "hero diver." I have also become an apostle concerning certification and safe diving and go about doing a lot of preaching. No one, but no one, should ever consider diving without going through one of the nationally recognized certification courses. Certified divers whose diving experience has been limited to certain areas, especially the tropics, should first make a few dives with a buddy who is familiar with the new waters. Too often, I have seen divers who are unfamiliar with wet suits or life vests trying to cope with both items in addition to the trauma of cold, unknown waters. This is one quick way of becoming a statistic. To use my instructor's favorite phrase, "Don't be a hero diver!" **

Little Wildcat Few People Know

by Pedro Ramirez Jr.



Moving like a silent shadow through the twisting narrow paths in the thorny brush, the jaguarundi stealthily stalks its prey.

Its keen eyes have spotted a large gray woodrat munching on dry seeds. The feeding woodrat is completely unaware of the predator's presence until the agile feline pounces. Seizing the rat with its canines, the cat instantly breaks the rodent's neck. Then the jaguarundi carries its furry victim a short distance, lies down and begins to eat it.

Although the jaguarundi appears to be an exotic cat from far-off tropical jungles, it is a native North American cat. Its range extends from Argentina northward to South Texas, and the cat seems quite at home in the thick, spiny brush in Cameron, Hidalgo, Starr and Wilbrey Counties. There have also been occasional sightings in other areas of the South Texas brushlands; Dr. Clarence Cottam twice observed a pair at Welder Wildlife Refuge near Sinton in 1973. Cacti, mesquite, cat-claw, granjeno and other thorn-laden vegetation provide the jaguarundi with cover and protection from its greatest enemies, dogs and man.

An excellent climber, the jaguarundi often travels considerable distances through a tropical forest using the intertangled branches as its path, but it commands as much agility on the ground as in the trees. Its long body and tail and short legs enable it to wind through seemingly impenetrable brush in its search for prey.

Primarily nocturnal, this little-known predator also hunts by day. It slinks along branches like a phantom and captures small birds, eggs or nestlings. When attempting to capture low-flying birds, the jaguarundi reportedly springs off the ground into the air. Occasionally the cat feasts on domestic fowl, but rabbits and rodents, as well as birds, appear on its menu.

This unusual cat swims quite well and also feeds on fish, frogs and crayfish, hence its nickname "otter cat." It is also known by several other names: weasel cat, red cat, gray cat, eyra and cacomitli.

Its small flattened head, snub nose, small ears and long body and tail make it tend to resemble a weasel. Unlike other members of the cat family, the jaguarundi has round pupils rather than the usual vertical ones. Its sleek, low-profiled body has a maximum length of four feet, but the tail can make up almost half of its total length. Weighing 15 to 20 pounds, this lightweight animal is about twice the size of a house cat at full maturity.

Jaguarundis can be either red or gray. For years the two color phases were considered as two separate species. Jaguarundi, *Felis cacomitli*, identified the gray phase; and eyra, *F. eyra*, designated the red phase. Both the red and gray phases possess identical body form and skeletal structure. In fact, one female can have the two color phases in the same litter. Today, both color phases are considered by mammalogists to belong to the same species, *Felis yagouaroundi*. The species name, *F. yagouaroundi*, comes from the Guiana Indian name *yagouar*, given to its larger relative the jaguar, which means "he who strikes down his prey with a single bound."

The gray jaguarundi exhibits a salt-and-pepper or grizzled appearance, and from a distance appears bluish-gray in color. Its winter coat is darker. A rusty brown coat sprinkled with black hairs distinguishes the red jaguarundi. Its paler underparts gradually blend into white on the lips and throat.

Little is known about the breeding habits of this mysterious little cat. Reputedly there are two breeding seasons, spring and fall; however, young have been observed at all seasons. Presumably the female bears two or three kittens in a litter, but the exact litter size remains unknown. The young are probably intensively cared for by the mother and meticulously taught the hunting skills essential for their survival.

Since the 1940s men and machines have drastically changed the Lower Rio Grande Valley. Agriculture and urbanization are rapidly destroying the junglelike habitat of the jaguarundi. Today less than 10,000 acres of lush, subtropical chaparral remain in scattered patches throughout the area.

Two thousand acres of the existing thorny woodland receive protection from human encroachment in the Santa Ana National Wildlife Refuge. This refuge contains the largest tract of natural vegetation left within the Valley. Established in 1943 to preserve the original vegetation and wildlife, the refuge harbors a wide variety of plants and animals of Mexican origin which reach their northern limits of distribution in extreme South Texas.

Additional brush tracts owned by the World Wildlife Fund and this department and the Bentsen-Rio Grande State Park also serve as wildlife refuges.

The future of the remaining spiny brushland outside the boundaries of these refuges is uncertain. Habitat destruction poses the greatest threat to the survival of the jaguarundi. Once the individual animal's home is destroyed, the creature either moves on to a suitable unoccupied habitat or it dies.

Only recently have people become aware of the unique wildlife inhabiting the Rio Grande Valley. Thousands of tourists visit the Santa Ana National Wildlife Refuge and Bentsen-Rio Grande Valley State Park annually to observe wildlife rarely seen anywhere else in the United States.

Hopefully the few thickets still in existence outside the refuges will remain untouched by private landowners. These thorny woodlands provide birds and mammals with food, shelter, refuge from natural enemies, including man, and a place to breed and rear young. Left intact, the native brushland can help insure the protection and survival of South Texas' unique wildlife and the mysterious jaguarundi, the little wildcat few people know. **

Editor's Note: The jaguarundi is currently being proposed for federal classification as "endangered." Should this classification be finalized, the species will then be afforded protection by more stringent laws (federal and state) than presently exist.

OUTDOOR BOOKS

HOME BOOK OF SMOKE-COOKING MEAT, FISH & GAME and THE SMOKED-FOODS RECIPE BOOK by Jack Sleight; Stackpole Books, Cameron and Kelker Streets, Harrisburg, Pa. 17105, 1973; \$7.95 and \$8.95 respectively.

The rich flavor of smoked foods makes every cook a chef, and I don't mean the instant smoked taste achieved by dousing the meat with flavoring, but rather the deep, cooked-in flavor only achieved by cooking slowly over smoking embers.

Sleight's first book answers almost every question on how to build smoke ovens, what to look for in buying one and how to create a make-do oven, on-the-spot for preserving the take from a successful hunting or fishing trip. He explains all about brines, creating flavorful smoke, combining spices, roasting times, cold smoking and sausage making.

Once the cook has finished creating a delicious meat dish, it is time to put the second book to use. This recipe book contains hundreds of uses for the meat, fish, poultry, sausage, eggs and nuts which have been cooked in the smoker. From the exotic, complicated recipes to simple, quick sandwich spreads and snacks, a spectrum of recipes are presented to the reader.

How to smoke fish and game are questions which I receive from our readers quite often, and these two books should answer almost any question a person would have on the subject. — *Neal Cook*

THE SEA OTTER IN THE EASTERN PACIFIC OCEAN by Karl W. Kenyon; Dover Publications, Inc., 180 Varick Street, New York, N.Y. 10014, 1975; 352 pages, \$4.00 paperback.

For the adult reader interested in a comprehensive look at the sea otter from the wildlife biologist's point of view, *The Sea Otter in the Eastern Pacific Ocean* is a perfect choice. This book is the result of studies conducted from 1955 to 1967 by the Division of Wildlife Research of the Bureau of Sport Fisheries and Wildlife and was originally published in 1969 by the U.S. Government Printing Office.

Included are chapters on the physical

characteristics, habitat and food requirements, distribution, behavior and reproduction of the otter as well as observations concerning mortality, predation, poaching, management and how the animal adapts to captivity.

Under the general behavior section are found interesting facts concerning the solicitude of the mother for her young and her reluctance to abandon her pup even after the young otter is dead. How long a female will attend a dead pup is not known, but they have been observed grooming young that have obviously been dead for several days.

Excellent black and white photographs are scattered liberally throughout the text along with informative charts and graphs. Upon completing this book, the reader should have gained an insight into the private world of the otter and an understanding of the many problems facing this unique creature. — *Ilo Hiller*

CRANES OF THE WORLD by Lawrence Walkinshaw; Winchester Press, 460 Park Avenue, New York, N.Y. 10022, 1973; 370 pages, \$25.00.

Of the approximately 8,600 species of birds in the world, 15 are cranes. Their impressive stature and stately bearing have long held a strange fascination for man, but this book represents the first full-length, exhaustive study of the cranes of the world in more than half a century. In an effort to make it as comprehensive as possible, Lawrence Walkinshaw has observed first-hand all but one of the species. The only one unobserved is the black-necked crane, a rare central-China and Tibetan species.

Detailed coverage is given to migration patterns, nesting behavior, mating and other dances, various calls, physical descriptions and every other obtainable facet of the cranes' lives.

In his chapter on the sandhill, Walkinshaw states that the sandhill crane is one of the oldest living birds. Bones exactly like those of present-day sandhills have been found in Pliocene and Pleistocene deposits, some four to nine million years old.

Of special interest to Texans is the chapter on the whooping crane and its

survival. Walkinshaw credits their survival to four things (1) the creation of the Wood Buffalo National Park, (2) the creation of the Aransas National Wildlife Refuge, (3) the fact that the bird nests in an impenetrable wilderness and (4) the educational program begun by the National Audubon Society and carried on by the Canadian Wildlife Service and the United States Fish and Wildlife Service to convince the public of the bird's endangered status and its worthiness of saving.

This comprehensive chronicle of the crane family belongs in the library of those individuals with a professional or avocational interest in bird life. — *Ilo Hiller*

THE SOUTHERN SEA OTTER by Ernie M. Holyer; Steck-Vaughn Company, P.O. Box 2028, Austin, Texas 78767, 1975; 30 pages, \$4.68.

Geared to ages six through 10, this book features the threatened sea otter and joins the Steck-Vaughn "Endangered Animals" series.

With the help of J. M. Roever's numerous illustrations, Holyer introduces the young readers to this unique creature and gives them a glimpse into its private world. They will learn that the sea otter is one of the world's few tool-using animals, and perhaps the only one to use tools both in and out of the water. Otters use rocks to break open the shells of clams, abalone and sea urchins, and they accomplish this feat in the water by floating on their backs with the rocks balanced on their stomachs.

Otter mothers carry their growing cubs around and care for them into their second year, teaching them how to survive and obtain food. When the mother dives for food, she may anchor her pup in a floating kelp plant by wrapping it in the leaves. The waves will safely rock it until her return.

Young readers are also made aware of the 170-year slaughter for fur that almost wiped out this once-abundant creature, and of its slow comeback to its present status when a treaty forbidding the killing of all fur-bearing marine mammals was made.

Books such as this one are a welcomed addition to the young reader's library at any time of the year. — *Ilo Hiller*

YOU'RE THE SOLUTION TO WATER POLLUTION

PHOTO AND ART CREDITS

Front Cover — Jim Whitcomb; Nikon F, 400mm Leitz Telyt; Kodachrome 64.

Inside Front — Leroy Williamson; Nikon F2, 300mm Nikkor; Kodachrome 64.

Pages 2-3 — Buddy Gough; Technical information not available.

Page 4 — Gough; T.i.n.a.

Page 6 — Dick Mason; Nikonos II, 28mm Nikkor; High Speed Ektachrome.

Page 7 — Alexander/Cannon; Nikonos II, 35mm Nikkor; Ektachrome X.

Page 8 — Alexander/Cannon; Nikonos II, 35mm Nikkor with 1:2 extension tube; Ektachrome X.

Pages 8-9 — Alexander/Cannon; Nikonos II, 35mm Nikkor; Ektachrome X.

Page 9 — Alexander/Cannon; Nikonos II, 35mm Nikkor with 1:1 extension tube; Ektachrome X.

Page 10 — Bill Reaves; Nikon F with motordrive, 28mm Nikkor; Kodachrome 25.

Page 12 — Nancy McGowan; Grumbacher water colors on illustration board.

Page 16 — Whitcomb; Nikon F2, 55mm Micro Nikkor; Kodachrome 25.

Page 17 — Reaves; Nikon F, 55mm Micro Nikkor; Kodachrome II.

Page 18 (top) — Reaves; Nikon F, 55mm Micro Nikkor; Kodachrome II. — (bottom) — Whitcomb; Nikkormat, 55mm Micro Nikkor; Kodachrome II.

Page 19 (all photos) — Reaves; Nikon F, 55mm Micro Nikkor; Kodachrome II.

Page 20 (top) — Reaves; Nikon F, 55mm Micro Nikkor; Kodachrome II. — (bottom) — John Suhrstedt; Nikon F, 50mm Nikkor; Ektachrome X.

Page 21 (top and bottom) — Whitcomb; Nikon F2, 55mm Micro Nikkor; Kodachrome 25.

Page 23 (top left) — Frank Aguilar; Nikon F2, 35mm Nikkor; Kodachrome 25. — (top right) — Aguilar; Nikon F2, 21mm Nikkor; Kodachrome Tungsten. — (bottom) — Aguilar; Nikon F2, 28mm Nikkor; Kodachrome 25.

Pages 24 and 25 — Courtesy Medina News Bulletin; T.i.n.a.

Page 29 — Aguilar; Nikon F2, 80-200mm Nikkor Zoom; Kodachrome 25.

Page 31 — Aguilar; Nikon F2, 80-200mm Nikkor Zoom; Kodachrome 25.

Inside Back — Reaves; Nikon F with motordrive, 400mm Leitz Telyt; Kodachrome II.

Back Cover — Reaves; Nikon FTM, 55mm Micro Nikkor; Ektachrome X.

LONG SHOTS SHORT CASTS

compiled by Neal Cook

Cemetery Wildlife: In the City of Boston and its suburbs, 50 cemeteries take up 35 percent of the land. When biologists studied the wild animals in these cemeteries, they saw 95 species of birds and found the nests of 35 species. They also counted 20 different kinds of mammals as well as snakes, frogs, turtles and many insect species.

Wyoming Hunters: A hunter-attitude survey in Wyoming revealed some of the definitions those hunters have on what is a quality hunt and their expectations from the hunting experience. There were five basic groups: Nature Hunters, Harvest Hunters, Skill Hunters, Equipment Hunters and Trophy Hunters. By far the largest number of hunters, 37 percent, were Nature Hunters who indicated that being out, relaxing, exploring and seeing various types of wildlife were primary components of a quality hunting experience. Harvest Hunters made up 26 percent of those sampled, and they said that hunting was an important method of supplying meat. Making a good, clean shot was an important part of the hunt — success was associated with quality. Skill Hunters, 23 percent, indicated that such things as competing with wild animals, the thrill of the stalk and the opportunity to improve and refine hunting skills were of primary importance — they also just enjoyed being outdoors and communing with nature. Equipment Hunters made up about 11 percent of the hunters, and they expressed a love of quality equipment and enjoyed teaching others how to hunt and use the equipment. Trophy Hunters made up only 11 percent of those surveyed and they placed primary importance on bagging trophy animals, exploring new areas and getting away from other hunters.

Can of Worms: Fishing worms always go to the bottom of their containers and you usually have to dump the dirt to find the worm. Next time take an empty coffee can, cut out the bottom and add a plastic lid from another can. You will then be able to get at the worms easily regardless of the end of the can to which they retreat.

Ancient Species: Litterbugs were active in the days of ancient Rome. Archaeologists excavating Herculaneum, a Roman city buried under lava from Mt. Vesuvius in the first century of the Christian era, found a sign at crossroads warning that litterers would be fined or subjected to corporal punishment. Visitors to William Shakespeare's birthplace in Stratford, England, may see a sign on the wall of one of the rooms reporting that "John Shakespeare, the poet's father, was fined for depositing rubbish in Henley Street in 1552." One of the first recorded actions against litter in the United States was an editorial in a Boston newspaper in 1784 condemning the litter left behind after an Independence Day celebration. The city fathers were urged to prevent a recurrence. The major difference between ancient and modern littering is that there is a lot more of it in present-day civilization. Litter today takes a half-billion-dollar-a-year tax bite out of the national pocketbook. That is the amount of the annual clean-up bill. The species could be eliminated, however, if each person would assume responsibility for the proper disposal of his own litter and trash. It is the individual who creates litter, and only the individual can prevent it. This means you and me.

Our Marine Fish

From the Common

Atlantic spadefish, *Chaetodipterus faber*, by Jim Whitcomb



Within the waters of the Gulf of Mexico can be found hundreds of species of saltwater fishes. They come in all sizes, shapes and colors, ranging from the common to the bizarre.

Biologists have been attempting to identify all the many species for the last hundred years; however, one piscatorial authority states that although more than 500 species have been identified in what is considered to be the northern Gulf of Mexico, our Gulf fauna is still poorly known.

Most saltwater fishermen readily recognize the redfish, trout, drum and the occasionally caught snook; but some may have a little difficulty with the rock hind, triggerfish, searobin, scorpion fish, look-down and stargazer.

How many of the saltwater fish can you identify? Or, more to the point, how many of the different species have you ever seen?

To help acquaint you with some of our saltwater residents, we present these specimens from our photographic files. **

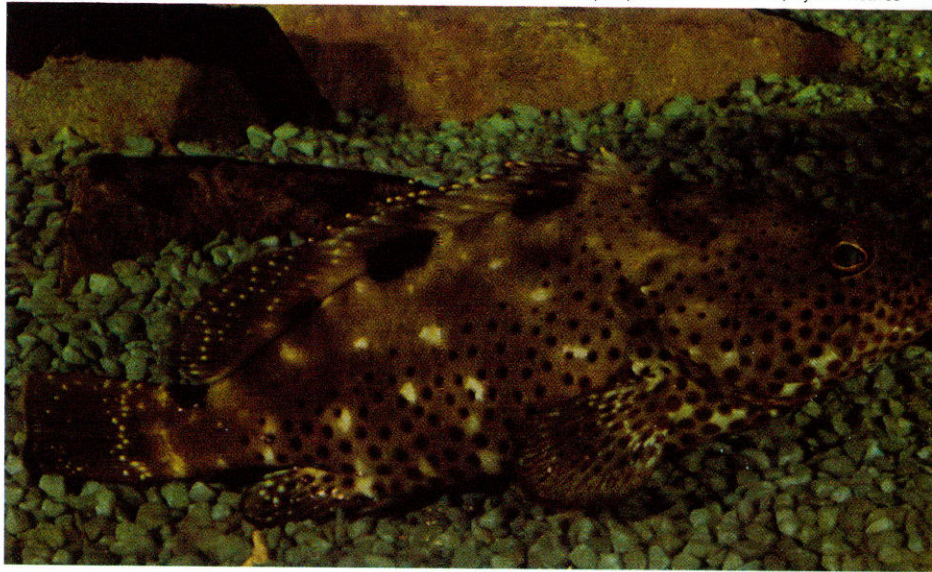
o the Bizarre



Queen triggerfish, *Balistes vetula*, by Bill Reaves

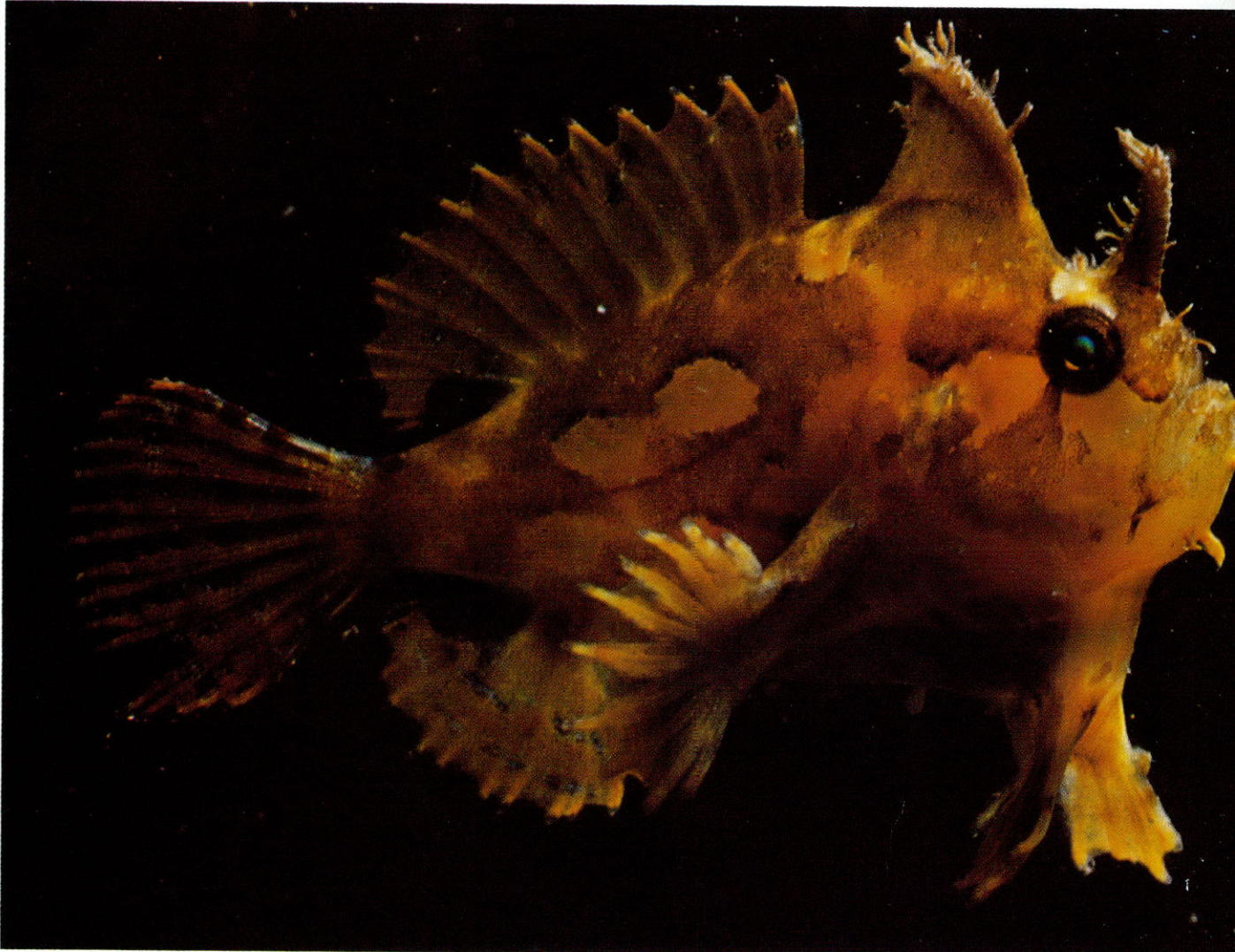
Reefs and man-made structures, such as oil rigs, attract a multitude of marine species. The food chain that begins with the minute plankton moves up to include the scavengers of the sea — sharks. Here the angler's catch may include the common spadefish, a tropical triggerfish or a razor-toothed barracuda.

Rock hind, *Epinephelus adscensionis*, by Bill Reaves



Ability to camouflage themselves or blend into their surroundings enables many species to survive in their watery, "eat-and-be-eaten" world. Some rely on coloration alone, such as spots, stripes and blotches, while others have bizarre body shapes as well as coloration to help hide them.

Sargassumfish, *Histrion histrio*, by Jim Whitcomb



Snook, *Centropomus undecimalis*; Sea catfish (hardhead), *Galeichthys felis*; Red drum (redfish), *Sciaenops ocellata*; by Bill Reaves



Lookdown, *Selene vomer*, by Bill Reaves



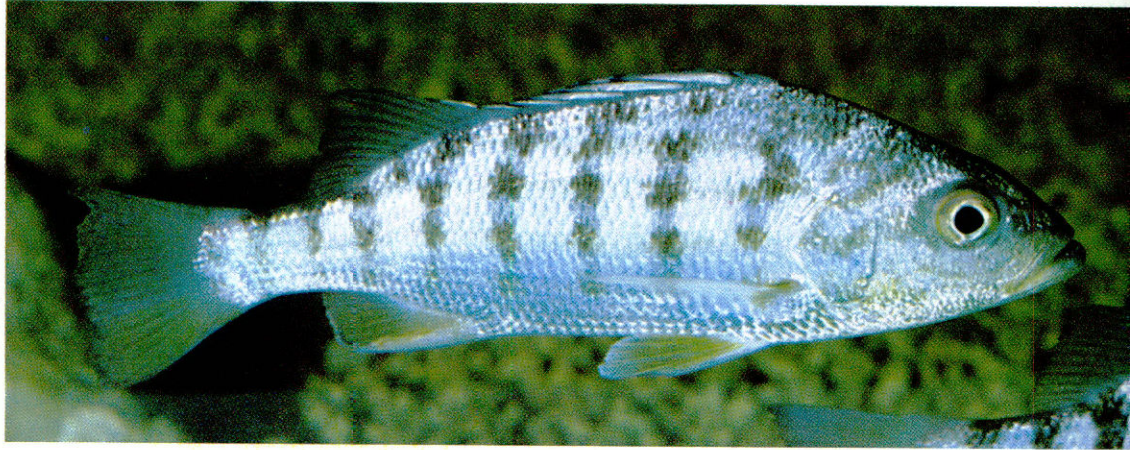
Spotted scorpionfish, *Scorpaena plumieri*, by Bill Reaves



Fishermen throwing a bait into coastal waters can never be sure what type of fish may end up on the hook. While most fish afford great sport and tablefare, others such as bait-stealing hardhead catfish or scorpionfish have sharp spines that can injure the unwary angler.

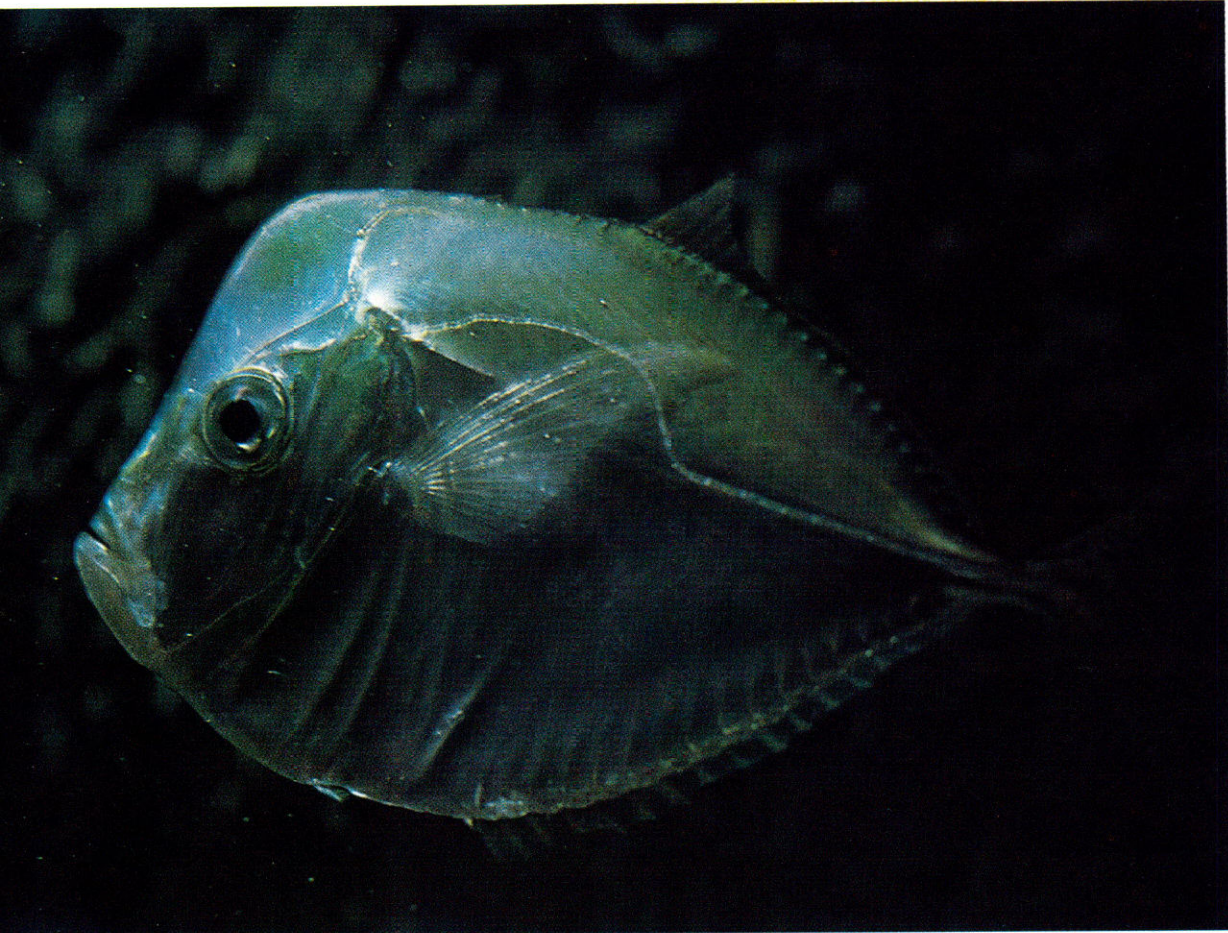
A fisherman might not be too surprised to pull in an ordinary-looking grunt, but an air-filled puffer, an angular-shaped moonfish or the big-headed searobin with its "walking fins" might be another matter.

Barred grunt, *Conodon nobilis*, by Bill Reaves



Puffer, *Sphoeroides* sp., by John Suhrstedt





Searobin, *Prionotus* sp., by Jim Whitcomb



Landmark Inn State Historic Site

Step Back Into the Past

by Joan Pearsall

Tranquilizers come in many varieties nowadays, but there still are some good old-fashioned prescriptions that can hardly be improved. One can be found within the state park system. It involves stepping into calmer surroundings and a different way of life — sometimes into a different era.

A superb example of present-day tranquility in an old-world atmosphere is the Landmark Inn, recently acquired by the Texas Parks and Wildlife Department as a state historic site. This venerable inn is located 25 miles southwest of San Antonio on the Medina River in Castroville, the Little Alsace of Texas, where it has offered shelter to wayfarers for well over a century.

The charm can be felt from the moment you arrive at the historic little town, founded soon after the birth of the Texas Republic, and enter the courtyard of the inviting old inn. Outside the office is a large blackboard indicating which of the eight guest rooms are taken, along with current messages.

Waiting to greet you is Miss Ruth C. Lawler, who has lived there since the 1920s when her brother bought the property, and who in 1974 donated the property to the state to be preserved as the unique historic site it is. Miss Lawler temporarily continues to conduct tours and run the guest house and may, if you're lucky, assign you the room believed to have been slept in by Robert E. Lee.

Originally from New Orleans, the Lawlers over the years have made important contributions to the civic and cultural heritage of the community of Castroville, as their inn itself has done through all the decades of its existence. The spirit of the place is contagious and, as you wander through the picturesque grounds and buildings or sit in the upstairs gallery overlooking them, enjoying the breeze, it is easy to imagine and identify with the people and events that have surrounded the area.

After Texas became a republic in 1836, there was a pressing need for colonists to settle the vast new land. One method of encouraging this was to give land grants to individuals, and Henry Castro gained such a grant.

Castro first came to America as consul for the Kingdom of Naples at Provi-

dence, Rhode Island. In 1838 he returned to Paris and entered into partnership with the banking house of Lafitte & Co. While negotiating a loan for Texas, he became interested in the young republic. This led to his appointment by Sam Houston as consul general for Texas in Paris and later to a colonization contract.

As a colonist, Castro is said to be second only to Stephen F. Austin in the number of families settled, and he spent more than any other single individual in doing so — at least \$100,000 of his own money.

Under the terms of his contract, he received a land grant four miles west of the Medina River on which he was to establish 600 families or single men over 17 years of age within three years. Finding there was no stream of water on the land, he purchased 17 additional leagues between his grant and the river. Each family was to be allotted 640 acres and each single man 320 acres.

Castro's contract time was later extended two years, as there was some difficulty at first in recruiting settlers since France, at the same time, was trying to colonize Algeria. However, Castro found his staunch colonists in the Rhenish provinces of Alsace and Lorraine, which then were included in French territory on the eastern border, directly across from Germany. During the 1840s about 5,000 of Castro's settlers were brought in 27 ships to Texas soil. Most of them were laborers and craftsmen.

Castro's plans were to surround his land grant with villages and over several years he did manage to establish three other settlements besides Castroville. Of these, D'Hanis still has a population of several hundred and Quihi has around 100 residents. At New Fountain only the church now marks its identity.

Within the grounds of Landmark Inn a huge, oddly shaped pecan tree catches the eye. One of the Famous Trees of Texas, it also has seen much history. It stands at the approximate location where Henry Castro and a small group of Alsatians made their first encampment on September 3, 1844. A few days later, on September 12, Castroville was officially founded when Jean-Marie Odin, bishop of Texas, said Mass in the

shade of the great tree and blessed the cornerstone for the first Catholic church between San Antonio and the Rio Grande.

Life for the settlers in the early days was full of extreme hardships. They had to cope with typhus and cholera, drought and famine. They had to search for birds' eggs and used the fat of snakes for cooking. With the rain that came at last after 15 months of drought, there was also a plague of locusts. There was constant danger from wild beasts and Indians and for a long time the presence of a detachment of Captain Jack Hay's Rangers was a necessity in the new settlement.

The tenacity of the colonists was gradually rewarded. By 1848 the grant had become so well-populated that the Legislature created Medina County, and two years later Castroville was named its county seat. The first, temporary houses had been made of logs put together with pegs chinked with mud and roofed with plaited grass. These were replaced by mostly single-story structures of native limestone with lime and adobe mortar reinforced by cypress. The thick walls were plastered and whitewashed and the steep, gabled roofs made of wood shingles gave a semblance of European farmhouses.

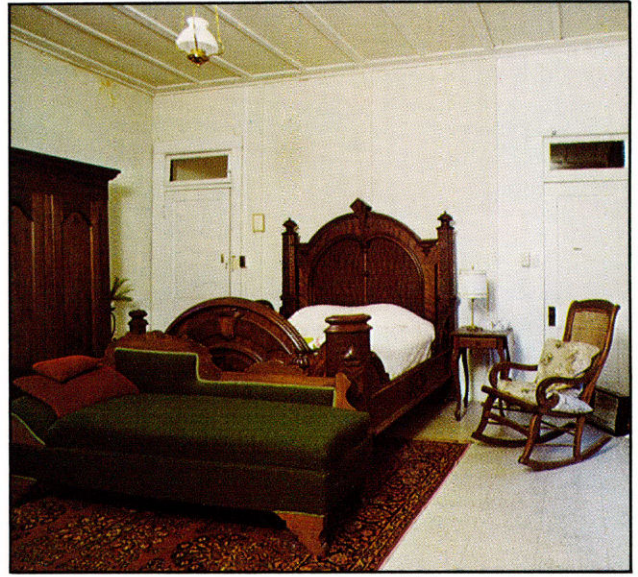
A traveler passing through in 1854 remarked: "The cottages are scattered prettily and there are two churches, the whole aspect being as far from Texas as possible. It might sit for the portrait of one of the poorer villages of the upper Rhone Valley."

The layout of the town was indeed in a European style, with the best houses built about a "place, dominated by a slender church spire." Street width was 17 varas, a Spanish-Portuguese measurement. One vara equals 33.38 inches. Names of world capitals and of relatives and friends of Castro were used to designate the streets.

Also in the manner of the old country, a cross was erected at the top of steep, rocky Mont Gentilz, or Cross Hill, benignly overlooking the growing community. To this day, religious pilgrimages are made there during Lent.

Landmark Inn had its beginnings soon after the founding of Castroville. Around 1848, Caesar Monod, a French settler, purchased one of the original

Miss Ruth C. Lawler (lower left), who has lived on this property since the 1920s when her brother bought it, temporarily conducts tours and runs the guest house at Landmark Inn. If you seek accommodations at the inn, you might be assigned to this bedroom (lower right) with its antique furnishings. From the back courtyard (bottom) visitors are presented with an overall view of the inn.



Photographs by Frank Aguilar



In 1900 when this historic photograph (right) was taken, the Vance House was being used as a warehouse for the cotton gin and probably also held milling supplies. The other photograph (opposite page), taken in the 1930s, shows the rear view of the Haass-Quintle Grist Mill that was built by these two gentlemen in 1854.

lots from Henry Castro for \$200, and an adjacent one later for \$150 from Michel Simon, a German farmer. He built a one-story stone residence and store with an ell and detached kitchen. A flourishing dry goods merchant, he became Mayor of Castroville in 1852.

The property changed hands in 1854. The new owner, an Irishman by the name of John Vance, added a second limestone story with six rooms to the main structure, plus a double gallery to the courtyard facade. The banister of the stairway leading to the upper balcony was made of one continuous piece of cypress. Vance and his family lived in the two-story portion until he built another house close by, and he operated a general store in the one-story ell. During the number of years he served as postmaster, a first-floor corner room was used as the post office. This room retains an interesting corner fireplace and large, hand-hewn pecan doors opening to the courtyard. On the street side, the double walnut doors still have the old mail slits.

Due to the location of the building on the much-used road between Mexico and San Antonio, it became a stopping place for wagons and stagecoaches, and Vance frequently rented rooms to travelers and outfitted them with supplies. Visitors were a colorful assortment of Southwestern characters, including trail herders, scouts, gamblers, hunters and men of renown such as Big-foot Wallace and the good friend of the family, Robert E. Lee. The house became known as the Vance Hotel.

For the convenience of his guests Vance built a two-story bathhouse, with the top story lined with lead to serve as a cistern for water hauled from the river. The water was heated by a fireplace on the first floor. This was said to be the only place to get a bath between San Antonio and Eagle Pass. Tradition has it that the lead lining was melted during the Civil War to furnish bullets for Confederate troops. Nowadays, the lower floor is used for restroom and laundry



facilities, and the upper room is the park manager's office.

The year he bought the property, Vance sold the lower parts of his two lots to George Louis Haass and Laurent Quintle, who built a stone and wood dam across the Medina River, a two-story stone gristmill, an underground mill race running from the dam to the mill and a nearby cotton gin. The gristmill, part of which still stands and is now again within the Landmark Inn acreage, was one of the earliest in Medina County. It was a convenient asset to the community and a highly profitable investment.

Joseph Courand, a French Alsatian, became the next owner of the inn, mill site, dam and mill race. Courand had been a college professor in France, but after coming to Castroville he became a farmer and merchant and later established and taught in a private school. On his death, his son succeeded him in running the retail store and mill. The modernized mill and gin remained in operation until the early 1920s.

By the 1870s Castroville was a flourishing county seat with thrifty, happy people who paid heed to Castro's advice: "Begin your day with labor and end it with laughter." Proud of their heritage, they retained the old country

dialect as well as many time-honored customs.

Their religious history was a strong factor, predominantly Catholic plus an early-day Lutheran congregation. The first small Catholic church, built in 1847, still stands on the grounds of the Moyer School. The present St. Louis Church was finished in August 1870, an imposing structure built by men of the parish of locally quarried limestone and with beautiful stained glass windows. The pews and baptismal font are from the first church.

The more than century-old Moyer building itself has a rich history. First a convent for the Sisters of Divine Providence, it housed the first parochial school west of San Antonio, later sheltered political refugees, became a seminary, a military school and in 1959 again a convent for aspirant Sisters.

The first Lutheran Church was completed in 1854 and the present one, built in 1939, stands on the same site. In the 1950s a third denomination, Baptist, joined the community. Highlights of the town's social calendar are the annual dinners sponsored by the Catholic and Lutheran churches.

Castroville had been little affected by the Civil War and the post-war era was a prosperous one for the incorporated



city, a stopping point on a busy route to the rapidly growing West. It had attracted able attorneys and other professional men, industry and business were booming and a newspaper had been established. But there was to be a change in fortunes.

In 1880 the Southern Pacific Railway made a survey to pass through Castroville but stipulated payment of a \$100,000 bonus. This the townspeople refused to pay. There were many reasons, but the main one was that for those owning freight-hauling wagon trains, the railroad was a competitor. There was also the Alsatian outlook: "Let's not change what we have."

The bypassing of Castroville by the railroad eventually led to its loss of the county seat to Hondo and the city's reduction in status and economy. In this day and age, perhaps we can see this as a blessing in disguise for there is the present-day legacy of a unique community that has retained its cohesion and identity, not forgetting also its unusual charm. The later coming of the highway through the city, a concrete bridge spanning the river and other modern innovations did not upset this uniqueness. Maybe the railroad would not have either, but it is a matter for surmise.

In 1926, when Jordan T. Lawler purchased what is now the Landmark Inn property, the buildings were in a deteriorated condition. The vacant hotel no longer had a second-story gallery. Lawler made renovations and added bathrooms, demolished the gin building and converted the mill into an electrical power plant which supplied the surrounding area with its first electricity. He also created the city's first waterworks.

During World War II the majority of machinery in the power plant was sold as salvage. The inn was reactivated at this time, a very different era from its first years as a hostelry. The clientele had no less a part in history, for to relieve the housing shortage the Lawlers made the rooms available to wives of men stationed at Hondo Air Force Base. This was when the name "Landmark Inn" was adopted.

An outstanding event during 1975 was the visit to Castroville of a group from Alsace, several of whom stayed at the Landmark Inn. Many ties of culture and empathy were renewed at this time. To the delight of all, many old-country and American Alsatians found they still could converse in the old dialect.

In 1972, the Landmark Inn complex was entered in the National Register of

Historic Places. March 11, 1974, was the date Miss Ruth C. Lawler donated it to the Parks and Wildlife Department.

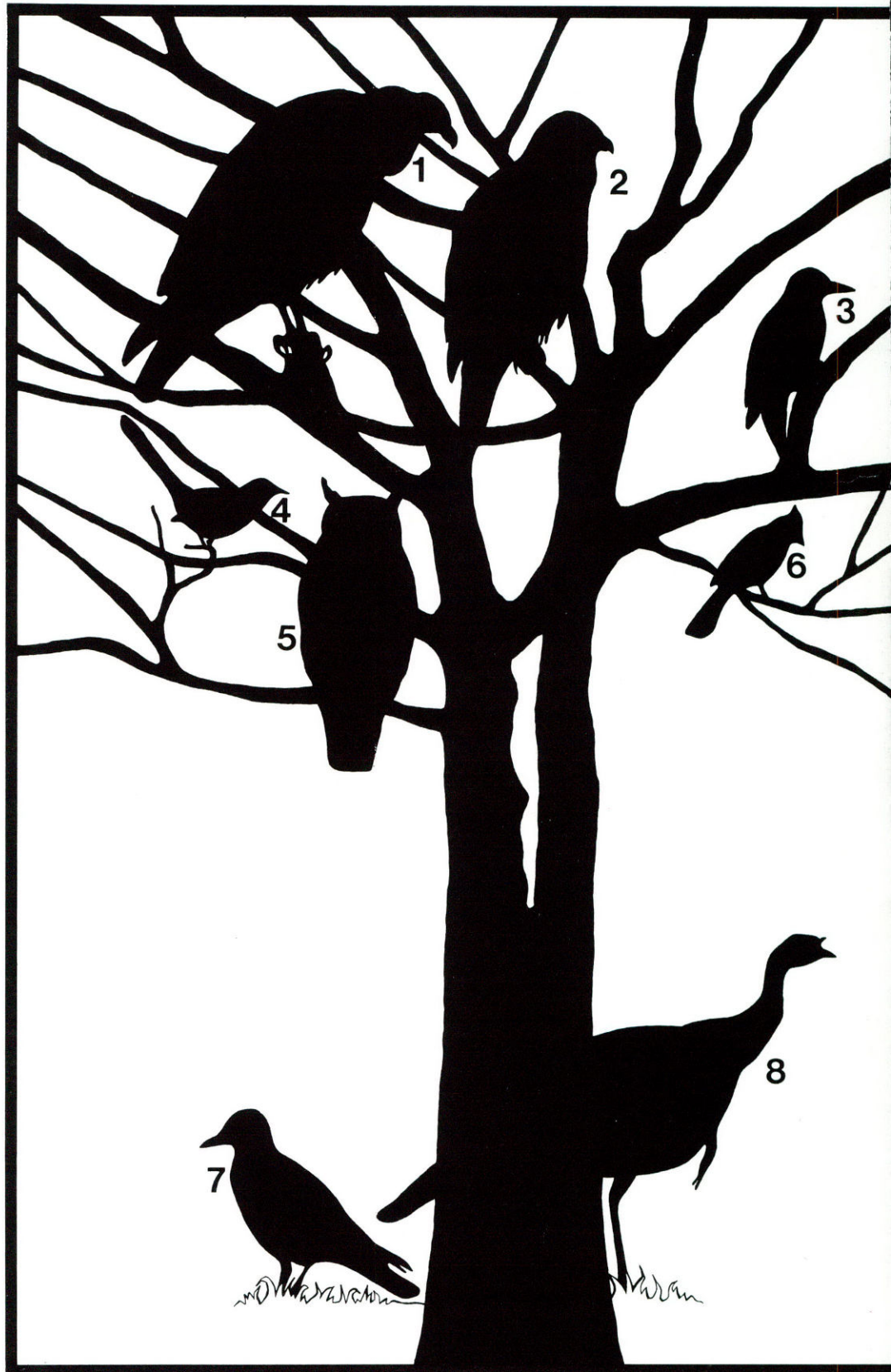
Castroville and the Landmark Inn now are entering a new era. The state is giving careful consideration to its plans for future operation of the inn and its interpretation to the public, aware of how important it is to retain its authenticity and atmosphere.

As always, the development of the city and the inn are closely related. Castroville, so convenient to San Antonio, attracts new residents as well as visitors. Some are commuters, many are retired and many are in the professions and arts.

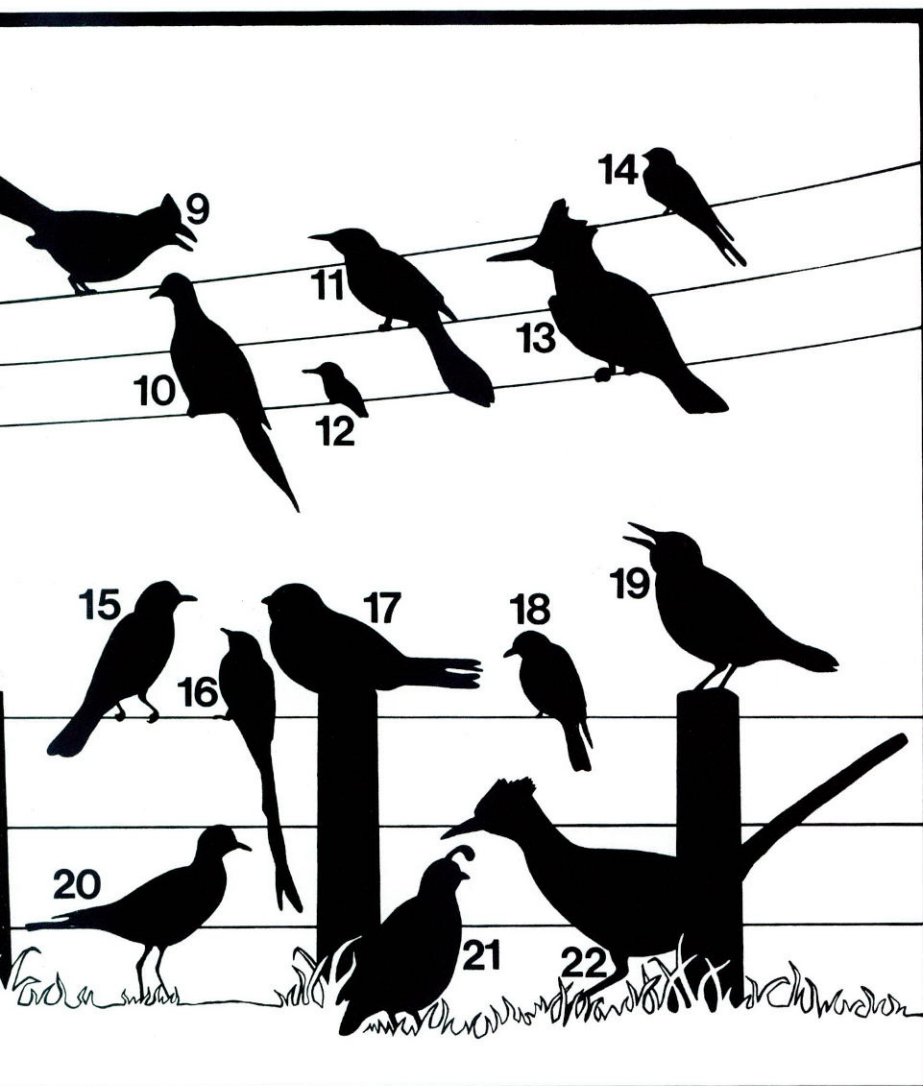
There is a warm dedication on the part of the park personnel and a genuine desire to preserve a valuable link with the past while giving fullest enjoyment of it to present and future generations. The interpretive aim is to present the different eras and cultures involved, and the economic importance of the store and mill. There may be a nature trail going down by the river to aid in appreciation of the natural setting.

There is an Alsatian motto: "He who values his own tranquility knows how to respect that of others." A tour of Landmark Inn should give at least an inkling of the truth in that statement. **

Young Naturalist



Bird Silhouettes



- | | |
|----------------------|-------------------------------|
| 9. VULTURE | 12. HUMMINGBIRD |
| 10. HAWK | 13. KINGFISHER |
| 11. WOODPECKER | 14. BARN SWALLOW |
| 12. MOCKINGBIRD | 15. ROBIN |
| 13. GREAT HORNED OWL | 16. SCISSOR-TAILED FLYCATCHER |
| 14. CARDINAL | 17. NIGHTHAWK |
| 15. CROW | 18. BLUEBIRD |
| 16. TURKEY | 19. MEADOWLARK |
| 17. BLUE JAY | 20. KILLDEER |
| 18. MOURNING DOVE | 21. GAMBEL'S QUAIL |
| 19. GRACKLE | 22. ROADRUNNER |

by Ilo Hiller

Developing an interest in birds and bird identification while you are young can lead to a career of bird study or a lifetime of bird-watching pleasure. You may even find yourself among the millions of people who consider birding an enjoyable year-round activity.

One of the basic things for the beginning birder to learn is how to recognize some of the more common birds by their silhouettes. Since body shape and size, tail length and shape, wing shape, bill type, leg length, the presence or absence of a crest and habitat choice all give clues to each bird's identity, this task may not prove too difficult.

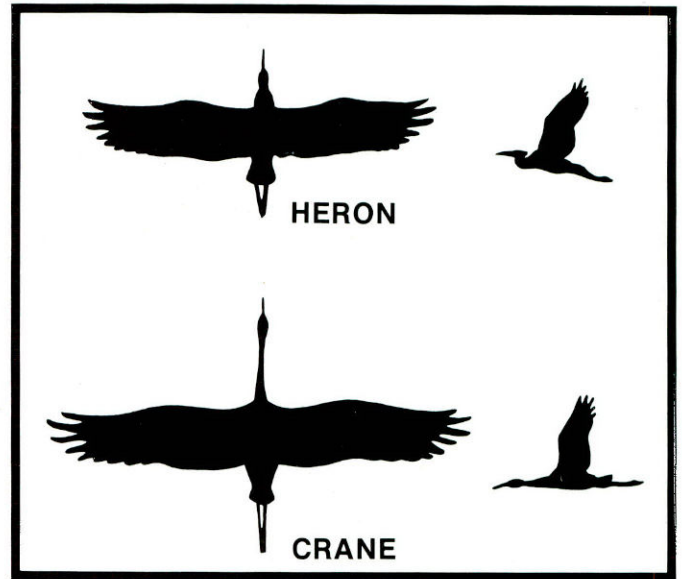
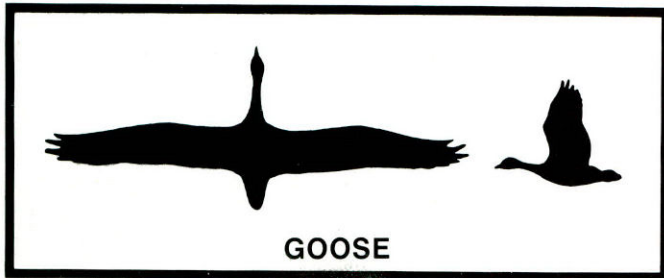
First consider the bird's tail. Is it forked like a barn swallow's, round-tipped like a blue jay's or pointed like a mourning dove's? Is it long like a mockingbird's, medium-length like a robin's, short like a meadowlark's, large like a grackle's or extremely long, thin and forked like a scissortail's? Does the bird use it as a brace against a tree trunk in the woodpecker fashion?

Next consider the bird's size. Is it as large as a crow, as small as a hummingbird, as slender as a swallow or as chunky as a quail?

Now look at the bird's head. Does it have a large pointed crest like that of the blue jay, cardinal and scaled quail, or is the crest very small like that of the bobwhite quail? Does it have a ragged-looking crest like that of the kingfisher and roadrunner, or does it have the distinctive plume of the Gambel's quail? If there is no crest, look at the shape of the head. Does it have the round, ping-pong ball shape of the dove or the streamlined head of the mockingbird?

A look at the bird's beak can also help you identify it. Hawks and owls have the large, hooked beaks of the meat-eaters, while the vulture, which feeds on carrion, has

Cranes (bottom right) fly with their long necks and long legs outstretched, while herons (right) fly with their long necks folded in an "S" shape. The legs of both species extend beyond their tail feathers. Geese (below) also fly with their long necks outstretched; however, their shorter legs do not extend beyond their tail feathers.



a less sharply hooked beak. Woodpeckers have long, strong beaks for pounding away at trees all day, while the kingfisher has a long, pointed beak to enable it to catch fish more easily. The poor night-hawk has an extremely small beak for a bird its size, but its mouth opens wide to enable it to scoop in insects as it flies through the air.

Beaks can also help you tell the difference between two similar silhouettes, such as the blue jay and the cardinal. Both are medium-sized with similar body

shapes and crested heads; however, the cardinal has the short, thick bill of the seed-eater, while the blue jay has a longer, thinner beak.

Flying birds present a different kind of silhouette, and it may be difficult to tell the difference between many species, but you should still be able to tell the difference between a flock of geese and sandhill cranes once you learn a few of the birds' characteristics. Both may fly in "V" formations, but here the main similarity ends.

Cranes fly with their long necks and long legs outstretched. Their legs extend beyond their tail feathers and can easily be seen. Their wings are slotted, which means that space shows between the flight feathers at the wing tips. Geese also extend their long necks in flight, but their shorter legs do not extend beyond their tail feathers and their wings are not as slotted. Herons, which are very similar to cranes, fly with their long necks folded in an "S" shape.

Keeping all these little hints in mind, see how many of our bird silhouettes you can identify. Don't be too discouraged if you don't recognize them all the first time. No one became a bird expert overnight. **

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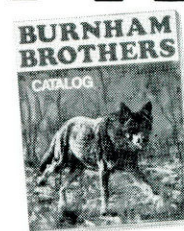
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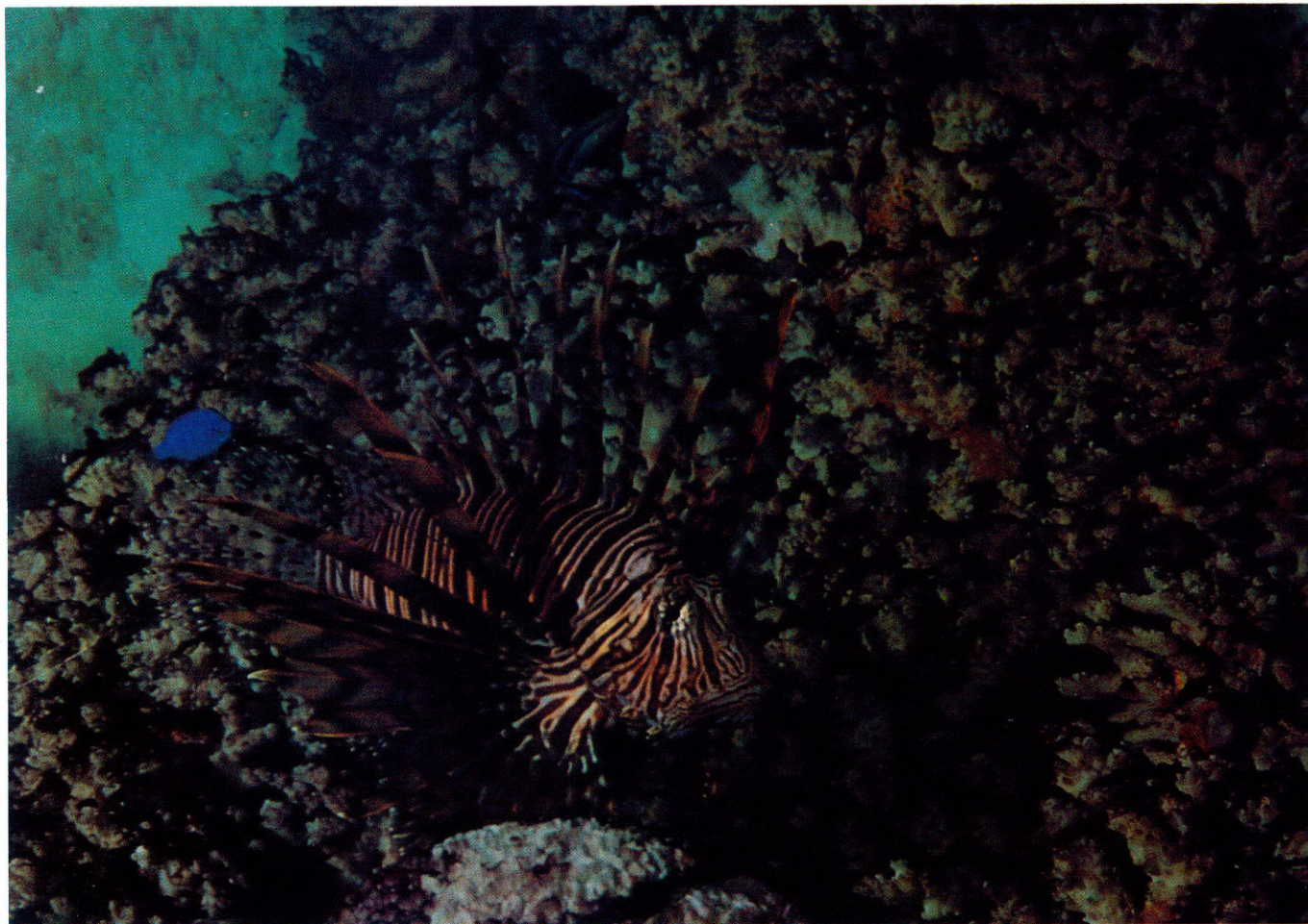


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How To:

Set Up a Saltwater Aquarium



Lionfish, *Pterois volitans*, by Frank Aguilar

by Rick Pettit

Maintaining a marine aquarium is no more difficult than keeping a freshwater one; however, the methods differ. This, no doubt, is why so many people are unsuccessful with their first saltwater tanks. The following procedure is generally accepted as the most common, simple and inexpensive method for the average person to use for successful results.

EQUIPMENT NEEDED

Glass aquarium — minimum size, 20 gallons. Smaller aquariums are easily overcrowded and fouled.

Synthetic salt — contains none of the impurities found in natural seawater.

Undergravel filter — most vital part of the aquarium.

Air pump, valves and air tubing.

Fluorescent light fixture.

Sea-Lux fluorescent bulb.

Glass cover for aquarium.

pH nitrite testing kit.

Dolomite (or other calcareous gravel) — must be well washed. Buy enough to cover filter two to three inches or approximately 1½ pounds per gallon.

Hydrometer/thermometer combination.

Patience.

Suggested extra items to have on hand:

Algi-Gro — algae food and stimulant.

Vitamin complex.

Two new five gallon plastic trash cans — to be used for aquarium purposes *only*, such as hauling and mixing salt water. Any that have contained detergents are *not* to be used.

SETTING UP THE AQUARIUM

1. Wash the aquarium and its equipment *thoroughly*. Use water **ONLY**, no soap or cleansers.
2. Select a draft-free location, keeping in mind that the aquarium should not be in direct sunlight and should be near an electrical outlet. Weight of the aquarium — 8½ pounds per gallon or 10 pounds per gallon including

equipment and decor — is another factor to consider, so select the location accordingly.

3. Since animal life is absent, the salt water may be mixed directly in the new tank. Fill the aquarium three-fourths full with fresh water. Assemble the undergravel filter and place it in the tank while tilted at an angle to release trapped air beneath. While holding the filter down on the bottom, slide it to the back of the tank and pour in the gravel. The filter will now stay in place. With flexible airline tubing, connect the air pump to the filter and start the pump. Now add approximately one pound of salt per four gallons of water. Allow several hours for the salt to completely dissolve. Check the salt content (salinity) by placing the hydrometer in the aquarium and reading the scale at the water line. If the reading is below 1.020, add small amounts of salt until the salinity reaches 1.020 to 1.022. If the reading is above 1.022, lower the salinity by adding fresh water until the correct salinity is achieved. The tank should now be filled to within 1½ inches of the top rim. Readjust the salinity if necessary.
4. Install the heater and set it at 75 to 80 degrees. Place the cover and light on top of the tank. Leave the light on 24 hours a day and add Algi-Gro (follow bottle directions) to promote algae growth. NOTE: As the aquarium water evaporates replace it with fresh water; the salt does not evaporate.

DECORATING THE AQUARIUM

The marine aquarist has a vast array of beautifully sculptured corals, seashells and sea fans, as well as many live, nonmoving invertebrates to choose from when decorating the tank. Only the imagination and pocketbook will limit the beauty of the tank.

The nonliving decorations mentioned above must be treated before being placed in the tank. This is accomplished by soaking them in a half-and-half solution of bleach and water for a day or two. Soak them an equal amount of time in fresh water or until all odors of chlorine are removed. Corals may be bleached further by allowing them a full day in the sun.

When arranging the decorations, choose a striking centerpiece such as a large conch, helmet shell or a well-shaped piece of coral. Place this piece just off center and arrange other pieces on either side, keeping like varieties together. Keep tall, large items well to the rear of the tank. These suggestions should produce an attractively balanced aquarium.

CONDITIONING THE AQUARIUM

Now is the time that the last essential, patience, is needed. As mentioned before, the undergravel filter is the most important part of the aquarium. Bacteria, known as nitrifiers, form in the gravel atop the filter. They convert ammonia, a deadly chemical resulting from decaying food and wastes, into less harmful compounds known as nitrites. These bacteria, however, are not present when the aquarium is first set up. This is why you must wait before indiscriminately stocking your tank.

To culture these bacteria, you must add such animal life as the hardy damselfishes, or invertebrates such as anemones or hermit crabs that are able to withstand high nitrogen levels. Add them in a ratio of one occupant per seven gallons. The feeding of these animals and the wastes they produce will supply enough ammonia to get a colony of bacteria started. During this four- to five-week "conditioning period" do not add any more occupants. A weekly check with the nitrite testing kit will show the nitrite level soaring the first week or two, then gradually declining to an acceptable level

(1 ppm or less). This indicates that the bacteria colony has grown and is now removing ammonia from the water as quickly as it is produced. Algae should now be appearing on the coral and glass — first as brown patches, which then turn a healthy green.

A new product has recently appeared on the market known as Nektonics Bio-Life. This product has been used by many aquarists with satisfactory results. By adding one package of Bio-Life per six inches of animal life, the conditioning process is accomplished in eight hours. You may then introduce fish and have a beautiful living aquarium without a long wait. However, it is still advisable to stock the aquarium sparingly for a week or two and avoid using the more delicate fish during this time.

SELECTING SPECIMENS

After completing the conditioning process, consideration must be given to the types of animals used to stock the tank. Care in selecting healthy fish is important. Fish with cloudy eyes; patches of gray or white skin; or tiny, white, raised specks on their skin and fins are sick and must not be purchased. In fact, the entire tank should be viewed with suspicion, since most diseases are communicable. Those specimens breathing hard, scratching themselves continuously or worse yet, lying down unable to swim, are obviously in distress. It could be tank conditions, but it is best not to take a chance.

Determining the health of invertebrates is more difficult, as many can be fine one day and dead the next. Look for these signs of healthy specimens: the mouthparts of crustaceans, such as shrimp and crabs, should be constantly moving whether they are eating or not. Sea anemones should be pumped up fully unless they have just been fed. Avoid those with "pinched tentacles" or torn basal discs. A sea urchin's tube feet should be moving constantly, even if the animal is in a stationary position. It should also be able to right itself if turned over. Starfish should be stretched tautly and may be checked for diseases by observing the tips of the arms where infection occurs as whitish blotches. More information about diseases — their prevention and cure — will be found in the references listed at the end of this article.

THE BIG SWITCH

Most saltwater fish do not readily acclimate to changing water conditions. After all, the ocean is the most stable environment on earth. Therefore, any changes to be made must be done carefully and gradually.

Animals purchased in pet shops will be packed in plastic bags. Rinse the outside of the bags, allow them to float in the aquarium and insert airstones into each one. Turn off the aquarium lights to avoid photoshock. After 15 minutes, add one-half cup of aquarium water into each bag. Continue to do so at 15 minute intervals until there is a 50 percent mixture of tank and bag water. Discard half of the water now in the bag and repeat addition process until the water is doubled again. Then carefully net the fish from the bag and gently ease it into the tank. Leave tank lights off until the following day. Disturb the fish as little as possible so that it can familiarize itself with the new environment.

NOTE: Salt water within the confines of a tank slowly, but surely, decomposes and often has an adverse effect on the tank inhabitants. To keep water in good condition, periodic water changes are necessary. Simply discard 10 percent of the tank water each month and replace with newly made seawater. Besides insuring a lower nitrite level and a constant pH, this method also replaces vital trace elements used up by the occupants.



This saltwater aquarium, containing a variety of fish species, covers one wall of an Austin restaurant. Although aquariums of this size with large fish are not practical for the home, many small, beautiful varieties of fish are available for home-sized tanks.

FEEDING TROPICAL MARINES

There are hundreds of choices of possible foods for marine specimens, ranging from live shrimp to dog biscuits. The aquarist must, therefore, do some research and select foods to suit his particular fish's needs. Diets should be as varied as possible to prevent a conditioned preference of one food to the exclusion of all others and to insure proper nutrition. Marine fish should be fed twice daily.

When using prepared foods, choose only high-quality brands such as Tetra (freeze-dried foods) and Longlife (freeze-dried tubifex). Fresh frozen shrimp, along with fish and scallops, provide very nutritious food and should be used as a staple in the fish's diet. This food may be finely shredded for young or small-mouthed fish or torn into bite-sized pieces (bite-sized for the fish — not the aquarist). Shells may be left on the shrimp when feeding strong-jawed fish like puffers and triggerfish as they like to crush their food and require the roughage for proper digestion. Herbivores and omnivores must have plenty of vegetable matter in their diet. This may take the form of washed frozen lettuce and spinach or better yet, good growths of green and brown algae.

Invertebrates enjoy the same foods as fish and should be fed directly, if possible. For example, drop food into the claws of a crab, or place food under a starfish's arms.

Filter feeders such as tubeworms and mussels feed by straining out plankton in the ocean. In the aquarium, they may be fed by adding newly hatched brine shrimp to the tank or by stirring two teaspoons of creamed spinach into one-half

cup of water and pouring this mixture into the tank. By alternating these two foods once or twice a week, the filter feeders should receive enough food.

Some of the most beautiful and bizarre creatures in the world are found swimming and crawling in the ocean. Their shapes, colors and behaviors seem to fascinate everyone. This article has been written to enable anyone to enjoy a few of these "wonders of the sea" in their own home while avoiding the pitfalls of this unique hobby. To find more information on the marine aquarium, the following references will be of great assistance:

- Exotic Marine Fishes* by H. Axelrod, T. F. H. Publications, 1971
- Fishes of the Northern Gulf of Mexico* by Jerry G. Walls, T.F.H. Publications, 1975
- Marine Aquarium Keeping* by S. Spotte, Wiley-Interscience, 1973
- Salt-Water Aquarium In The Home* by R. Straughan, A. S. Barnes and Co., 1972
- Tropical Marine Aquaria* by G. Cox, Grosset and Dunlap, 1974

PLACES TO VISIT

- Hawaiian Marine Imports, Houston, Texas
- Sea-Arama Marineworld, Galveston, Texas
- Sea World, San Diego, California
- Shedd Aquarium, Chicago, Illinois
- Steinhart Aquarium, San Francisco, California

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LETTERS TO THE EDITOR

Hairy Hides

Sure enjoyed your article on tanning deer skins in the November 1975 issue. Do you have some information on how to treat the skins leaving the hair intact? I have a very old chair that is badly in need of a new deer skin seat.

Fay Millican
Corpus Christi

■ Tanning skins with the hair left on is the easiest type of tanning, and good results can be had by most people on their first attempt.

Using a fairly sharp knife and the palm of your hand, pull the skin cleanly from the carcass. If the membrane that covers the muscle tissue can be separated and removed from the flesh side of the skin, very little scraping is necessary.

All meat and fat remaining on the skin must be scraped off, but do not scrape so deep that the roots of the hairs are exposed as the hair will fall out. Do not allow the skin to spoil because if the hair begins to slip, it can't be salvaged.

For best results, place the skin in tanning solution as soon as it is scraped

clean. If this is not possible, fold the skin, flesh side in, and freeze it.

One of the simplest tanning solutions consists of two pounds of alum and five pounds of salt dissolved in 10 gallons of warm water. A plastic garbage can makes a good container and is not affected by the solution.

Place the hide in the cooled, well-stirred solution and make sure the hide is thoroughly saturated. Stir two or three times a day for six or eight days until tanned. Colder temperatures require longer tanning time. To check the hide, slice an edge and see if it is uniformly light-colored throughout its thickness. If in doubt, leave it another day or so as you cannot overtan a hide with this solution.

When tanning is complete, remove the skin and wash it thoroughly in clean water to remove solution. Spread the hide on the ground in the shade, flesh side up, and let it dry almost completely. While barely damp, spray the flesh side lightly with neat's-foot oil. Then work the skin back and forth vigorously over a fleshing beam or the ta-

pered edge of a one-by-six-inch board for about an hour. This vigorous rubbing breaks down the skin fibers and makes the skin soft and white. If the skin is not soft and pliable after the initial working, dampen it again with water and work until it is as soft as cloth.

If the finished skin is a little too oily, tumble it around in a sack or barrel of hardwood sawdust. The sawdust will absorb any excess oils and leave the hair clean and shiny.

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A. A. Rambikur
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BACK COVERS

Inside: Fishing piers along the Texas coast provide access to saltwater fishing for those anglers who do not have boats. At peak periods, fishermen line the rails to fill their ice chests with popular saltwater species. Photo by Bill Reaves.

Outside: Winter's cold breath has made this spider's web useless by covering it with a coating of ice, and it is doubtful if the half-frozen spider will survive the cold to spin another one. Photo by Bill Reaves.



