OPERATION OF A LOBSTER POUND

Contents

The following is a summary of a lobster pounding seminar held on Swans Island, Maine on October 11, 1991. The seminar was organized by the Lobster Institute of the University of Maine and the Maine Lobster Pound Association (MLPA) in response to a request by the Swans Island Lobster Co-op. The Swans Island Lobster Co-op has recently completed construction of a lobster pound facility on Swans Island and has successfully pounded lobsters.

The principal organizers of this seminar were David Dow, Director of the Lobster Institute and Sea Grant Marine Advisory Program Leader and lobster researcher Robert Bayer, both of the University of Maine. The principal industry speakers were Herb Hodgkins, President of the Maine Lobster Pound Association, and Richard Carver, MLPA member and owner of several lobster pounds on Beals Island.

PREDATORS

Predators are one of the main causes of shrinkage in a lobster pound. The following list includes the major predators of pounded lobsters, along with suggestions on how to keep these predators away from a pound:

Raccoons

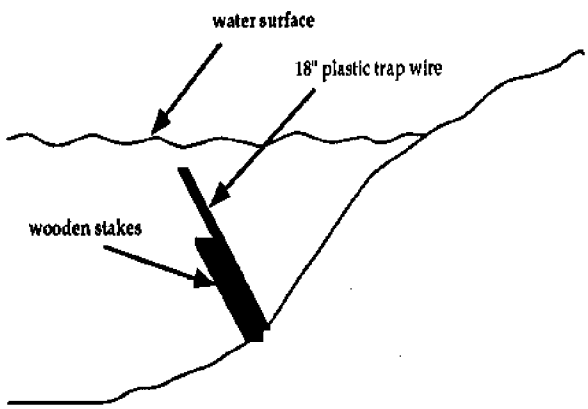
Raccoons patrol the shoreline area of the pound at night, and they can devour many lobsters in a single raid. Lobsters are active at night and tend to move close to shore, where raccoons capture them by reaching into the water with their front paws and pulling the lobster onto the shore.

Lobsters killed by raccoons will have their underside split open with only the tomalley removed. Raccoons generally eat only the tomalley and leave the meat untouched. Often, raccoons will haul the lobsters into the woods, so it's important to patrol the beach area as well as the surrounding woods.

There are several defenses against raccoon predation. The **best defenses** include:

1. An underwater fence.

This can be constructed using 18" plastic trap wire braced along the shoreline several inches below the water surface:



It is important to slope the fence toward the center of the pound. This will allow lobsters on the shore side of the fence to crawl back into deeper water and will also reduce the number of lobsters crawling into shore.

An underwater fence has several added advantages. First, it is inexpensive. Second, it will reduce the number of lobsters that freeze in the ice during the winter. And third, an underwater fence will prevent sea gull predation.

2. An electric fence around the shore of the pound.

It need not be a high fence. A three-foot fence consisting of wooden stakes and three or four electric wires will suffice to keep out raccoons.

The **second-best defenses** include:

1. Live traps.

Bait the traps with cooked lobsters. The problem with this approach is that the raccoons will always come back, no matter how far away you release them.

2. Leg-hold traps.

For this method, you need at least a #3 trap. Leg-hold traps are a problem, however, because you may end up catching somebody's dog or cat.

3. Dogs.

Dogs won't kill raccoons, but they will tree them. If this occurs, you will then have to decide what to do with the trapped raccoons.

4. Lights and music timed to come on and off through the night.

This will work for a little while, but eventually raccoons will no longer be scared off by these tactics.

Sea gulls (especially, Black Backs)

The best-known defense against sea gulls is to shoot them. It is legal to shoot sea gulls around a lobster pound, and this will keep the rest of the birds nervous and away from the pound.

Some pound owners hang a dead sea gull from a light pole or piling, and this will also tend to scare off other gulls. However, you will need to replace the dead gull after two or three days. An underwater fence (as shown on page 2) will also eliminate gull predation.

Shags

Shags, or cormorants, will dive underwater and drive their beaks through the lobster's carapace to suck out the tomalley. The best defense is to shoot them.

Two-legged Thiefs

Human theft is usually not a problem, but a powerful set of lights around your pound will reduce the temptation. Anyone stealing lobsters from your pound will usually do so from a boat. Normally, the thieves get caught when they try to sell the lobsters.

The best way to detect any type of predation is to walk the perimeter of your pound daily. When walking the shore area, make sure you check the surrounding woods. It is important to have the *same* person patrol the pound each day. A person who checks the pound every day will be more apt to detect and monitor signs of predation then someone who only patrols the pound occasionally. **Patrolling your pound daily is the best way to determine whether you have a predation problem.**

STOCKING YOUR POUND

The golden rule for stocking your pound is "Garbage in, Garbage out." In other words, **put *only* healthy lobsters in your pound.**

Unload lobsters into your pound by hand, and don't just dump the crates out. If a lobster is weak and limp, don't put it in your pound. A healthy lobster will vibrate or "hum" in your hand. Never put culls or lobsters with cracked or damaged shells into your pound. Lobsters with severely chewed antennae should not be put in the pound. These lobsters are very susceptible to disease. Most pounds will cook off damaged or weak lobsters and sell their culls.

Avoid putting lobsters that have been held in crates for several days or those stored in cars into your lobster pound. These lobsters have a high probability of contracting diseases.

MAINTAINING YOUR LOBSTERS

Contaminants

1. Pesticides.

Do not use any pesticides around your pound. Pesticides can run off into the pound during rain storms and kill your lobsters. Even the smallest concentration of a pesticide in your pound can cause catastrophic damage. The general rule is: If it kills insects, it can kill lobsters. Common garden pesticides can kill lobsters.

2. Chemical fertilizers.

Do not use any garden fertilizers around your pound, since these fertilizers contain nitrogen compounds which can kill lobsters.

3. Anti-fouling paints.

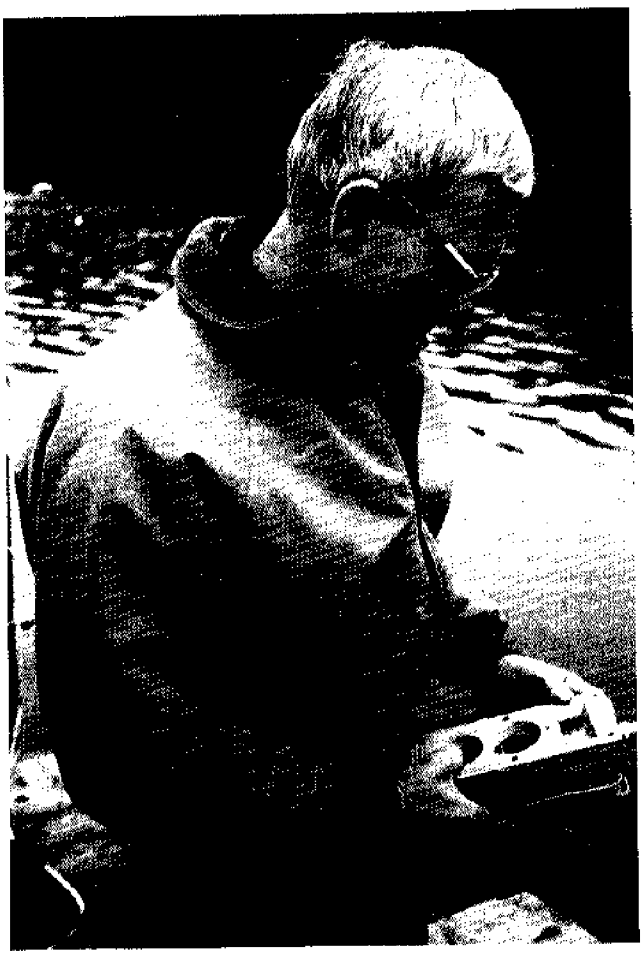
Do not use anti-fouling paints around your pound, because these paints can contain metals toxic to lobsters. Do not store these paints around your pound. Someone could spill them!

4. Copper paint and creosote.

Copper paint and creosote do not seem to affect lobsters, but they should be used in moderation and never stored around the pound.

5. Chlorine.

Chlorinating the bottom of a pound each year used to be quite common. The idea was to kill any bacteria left over from the previous pounding. **Chlorinating is probably a waste of time!** It is expensive and has harmful environmental effects. Besides, a new batch of lobsters will bring their own bacteria with them, and there are better ways of preventing disease—such as medicated feed.



Temperature

Five years ago, it was risky to try to pound lobsters during the summer months. The prevalence of diseases increases in warm water and the concentration of oxygen in the water diminishes as the water temperature increases. But now, with medicated feed and aeration, it is less dangerous to pound lobsters in warm weather.

Warm water does not hold oxygen very well. With aeration systems, you can keep the oxygen level up during warm weather through the entire tide cycle.

Remember, when using your oxygen meter, always measure from the bottom of the pound where your lobsters are. You may have plenty of oxygen near the surface or middle of the water column. But the oxygen levels may be lower a few inches from the bottom, because the lobsters have used it all up.

Oxygen

Maintaining a proper concentration of oxygen is critical to keeping your lobsters healthy. All pounds have aeration pumps and an oxygen meter to measure the oxygen concentration. When measuring oxygen concentration, make sure the receiver is in a deep part of the pound about an inch or two from the bottom.

Measure oxygen concentration in several places around your pound, and always be sure to measure from the same places each time. This will give you an accurate comparison to your last reading. An oxygen concentration of 8-10 ppm is the optimal level, 6-8 ppm is all right,

4-6 ppm is marginal, and under 4 ppm means trouble!

Lobsters have a much heartier appetite when they have healthy oxygen levels. Thus, with a well-aerated pound, you could increase the weight of your lobsters through feeding.

If you are feeding your lobsters medicated feed, be sure your oxygen level is high. This will increase the lobster's appetite, which will ensure that they eat the medicated feed.

A generator is an essential part of a pound, especially if you are in an area that has frequent power outages. During the warm months, it is critical to keep the aeration running.

Be especially conscious of your oxygen level during small tides, when there is very little water coming over your dam. This happens a few times in October.

In the winter, don't let your oxygen meter freeze. Keep it inside when not in use.

Measure your oxygen level daily during warm weather. It is a good idea to keep a record of the oxygen level, temperature, and quantity of lobsters in your pound.

Lobsters deprived of oxygen will tend to pile on top of each other to get higher in the water column, or they will move to the shallower areas of the pound where there tends to be more oxygen. If your lobsters are all near the shallow edges of the pound, you have a problem.

An excellent reference for selecting an aeration system or using your existing system more effectively is paper #897559, *Aeration of Lobster Pounds.* This paper can be obtained by writing to the American Society of Agricultural Engineers, St. Joseph, MI 49085-9659. Be sure to include the title and paper number in your request. Also, copies may be available through the Bio-Resource Engineering Department, University of Maine, Orono, ME 04469.

Feeding

Don't feed in the deepest part of the pound, because that is where the least oxygen is. If lobsters are not hungry, they will leave that feed there and it will rot. This can sour the bottom of your pound. Decaying feed will consume oxygen and may emit noxious gases. Lobsters will not eat rotten bait.

It is a lot more dangerous to overfeed your lobsters than to underfeed them.

Pelletized medicated feed is very important to prevent red tail, especially when pounding in warm water. The feed comes with a recommended feeding schedule, and you should follow this schedule closely. If you use too much medicated feed, it will increase the time it takes to clear the drug from the lobster.

Before you throw in the medicated feed, be sure all previous feedings are gone. After the natural feed is gone, you should wait one day before you start with medicated feed. This will ensure that the lobsters are hungry when you throw in the medicated feed.

You should not feed the lobsters anything else while they are on medicated feed. Also, remember the one month withdrawal time. **You must wait at least one month after feeding your lobsters medicated feed before you can remove them from your pound.** This is an FDA regulation and it is designed to ensure that the residues of the medication are out of the lobster's system before human consumption.

More information on pelletized medicated feed is available in a Maine Sea Grant publication, *How to Detect and Control Red Tail Dis-*

made especially for lobsters. Pelletized feed does not affect the flavor of the lobsters.

More information on pelletized non-medicated feed is available in a Maine Sea Grant publication, *An Artificial Diet for the American Lobster(Homarus americanus)*, pub. #E-MSG-85-1. Copies of this publication are available from the Sea Grant Communications Office, 30 Coburn Hall, University of Maine, Orono, Maine 04469, or from the Maine Agricultural Experiment Station Communications Office, 1 Winslow Hall, University of Maine, Orono, Maine 04469.

ease (Gaffkemia) in Lobster Pounds and Storage Cars, pub. #E-MSG-86-10. Copies of this free publication are available from the Sea Grant Communications Office, 30 Coburn Hall, University of Maine, Orono, Maine 04469, or from the Maine Agricultural Experiment Station Communications Office, 1 Winslow Hall, University of Maine, Orono, Maine 04469.

Pelletized non-medicated feed is an excellent feed for lobsters. However, it is difficult to gauge how much lobsters have eaten. One way to monitor this is to place the feed on a screen tray and gently lower it to the bottom. This way, you can pull the tray up and check it periodically. A pound of pelletized feed has as much protein as about nine pounds of fish.

A pound of pelletized feed is slightly more expensive than a pound of fish feed, but remember that most of your fish weight is water. Avoid pelletized salmon feed because it is very high in fat! You should only use pelletized feed

Feeding schedules: There is no set rule for feeding other than being sure not to overfeed. One way to monitor your feed is to use a bait bag. Check it periodically and if it is empty, throw more feed in. Some pound owners use metal racks to put the feed on and check them periodically. Also, you could use a diver to check the bottom. A small hand drag will also work. If you find you have overfed your lobsters, stop feeding for a while.

Do not feed crabs to your lobsters, because crabs can carry red tail. However, fresh or salted fish racks are good feed. Lobsters will not eat harbor pollock or mackerel, but sculpin, herring, and menhaden (pogies) are good feed.

Determining the Capacity of Your Pound

The old rule of thumb was that when the water temperature in the pound fell below 40° F (like conditions after October), you could put in one pound of lobster per square foot and a little more than one-half pound per square foot during the spring and summer (provided you medicate and aerate). However, **all pounds are different**, and a new pound should start off very conservatively. If you have a low shrinkage, then next year you can add a few more lobsters. Through experimenting, you will eventually determine your pound's maximum capacity.

DISEASES

1. **Red tail (gaffkemia).**

Red tail is a fatal bacterial disease of lobsters. The disease passes from one lobster to another through a wound or break in a lobster's shell. Even a chewed antenna or a wound from a wooden plug can provide enough of a wound for the bacteria to enter. A lobster cannot get this disease from eating a dead, infected lobster. There are acids in the lobster's stomach that will kill the bacteria. This disease is **not** contagious to people.

A certain percent of all wild lobsters have red tail disease. Therefore, when you place lobsters in your pound, there is a good chance that a few will already have this disease. Eventually, these infected lobsters will die in your pound and get broken up by the other lobsters in the pound. When this happens, millions of live bacteria cells are released into the water. These bacteria cells can infect any of your healthy lobsters through breaks or wounds in their shells. Eventually, these newly infected lobsters will die and the process repeats itself at a much more intensive rate. Because pounded lobsters are in such high concentrations, the disease spreads rapidly.

You cannot tell if a lobster has red tail from its physical appearance. You have to examine its blood through a microscope. One procedure for determining if you have a red tail problem is to sample the blood of 100 randomly chosen lobsters from your pound. The blood is drawn from the lobster with a syringe, mixed with a culture medium, and left in a warm place for 24 hours. If the blood contains any bacteria cells, they will multiply in the culture medium during this 24-hour period. The next step is to smear blood from each sample onto a slide and examine it under a microscope. By using this technique, you can estimate the relative incidence of red tail in your pound.

If you have a very low incidence (0-2 percent infected), then you may want to skip a medicated feed cycle. This would save you money and is better for the lobsters. Also, if you are finding dead lobsters in your pound and want to determine if they had red tail, you can examine a blood sample from them.

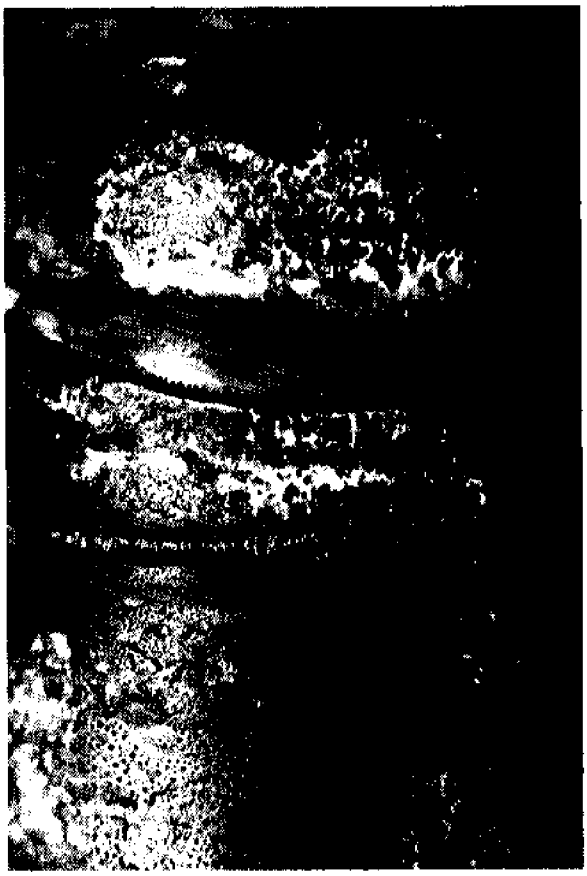
More information on this procedure is available in Maine Sea Grant Information Leaflet #13, *Early Detection Procedure for Red Tail (Gaffkemia)*. Copies of this publication are available from the Sea Grant Communications Office, 30 Coburn Hall, University of Maine, Orono, Maine 04469.

Although there are no unique physical symptoms of red tail, some of the things to watch for are:

- Weak and lethargic lobsters.
- Lobsters that stay near the shore of your pound and are very inactive. The bacteria deteriorates the lobster's ability to breath (absorb oxygen). As a consequence, they move towards the shore where there is more oxygen. If the oxygen level is at healthy levels in your pound and you are finding weak or dead lobsters near the shore, you should test these lobsters for red tail.

2. Shell disease.

Shell disease is a bacterial infection occurring on the lobster's shell. Unlike red tail, shell disease can be caused by a number of different bacteria. The bacteria initiates the infection through a scratch or break in the lobster's shell and breaks down the chiton (skeleton structure) in the shell. It is generally not fatal to the lobster, but the disfigurement of the shell gives the lobster an unattractive appearance that makes it unmarketable to consumers. The lobster meat itself is perfectly edible, although there is usually less meat due to the fact that lobsters stop eating when they contract shell disease. The disease is most often found on the back or claws of the lobster. The infected area shows up as pock marks or as a corroded and eaten away part of the shell, as if some sort of acid was poured on the shell. It is very contagious and will spread quickly through a pound.



There is no cure for shell disease. It is believed that lobsters who contract the disease have some sort of breakdown in their defense system, such as their ability to repair wounds. Often, the first sign of the disease is a brownish discoloration on areas of the shell. **If you have lobsters that appear to have shell disease, keep them out of your pound.** Researchers at the University of Maine are trying to develop a dip solution for treating the lobster's shell before they are placed in the pound. This disease has been most prevalent in the southern tip of Nova Scotia.

3. Cilliated protozoans.

Ciliated protozoan disease is fatal to lobsters. It has shown up in a half dozen pounds in the last few years. The protozoan enters the lobster through a break or wound in its shell. Mortalities can occur within a few weeks. Ciliated protozoans are large organisms and can be seen in a blood sample through a microscope under relatively low magnification. They are oval shape and swim around bumping into each other. Under high magnification, you may actually see the cilia, or hairs around the cells, beating rapidly.

Often, the blood of lobsters infected with this disease will look milky due to the high concentrations of the protozoans in the blood. The disease is fatal to lobsters but not harmful to humans. At present, there is no known treatment for the disease.

More information on ciliated protozoans is available in a Lobster Institute bulletin, *Ciliated Protozoan Threatens Lobsters.* Copies are available from the Lobster Institute, 22 Coburn Hall, University of Maine, Orono, Maine 04469

MAINTENANCE OF YOUR POUND

1. Periodical inspection of your lobsters.

This can be done with a small hand drag. Sample all around the pound, and look over the lobsters to make sure they are healthy. If you have some that appear weak and lethargic, you may want to have them tested for disease and also check your oxygen level. There are other ways to inspect your lobsters, such as using divers and underwater cameras. The problem with these methods is that the water in the pound is often too murky to see.

2. Ice removal.

Removing ice from your pound is optional. Some pounds have a setup for dragging under the ice for lobsters. This method is a little slower than dragging in open water, but it eliminates the time and labor needed to remove ice.

If you leave the ice in your pound, you need to keep the area along the front of your dam open. The rise and fall of the tides will tend to push the ice against the side of your dam. This could force the clapper valve open. Also, it may cause the sea water on a coming tide to flow on top of the ice rather than *under* it, which will deprive your lobsters of new oxygen. One way to eliminate this problem is to run an air hose along the length of your dam. The air flow will prevent ice from forming near the front of your dam.

Pounds that do remove ice use an ice saw to cut the ice into squares small enough to be

pushed through the pound gates. When cutting up your ice, be sure to get it out of the pound. Otherwise, the tides will pile it up and you will have a real mess. Ice does not have any physical effect on the lobsters.

3. Removal of lobsters from your pound.

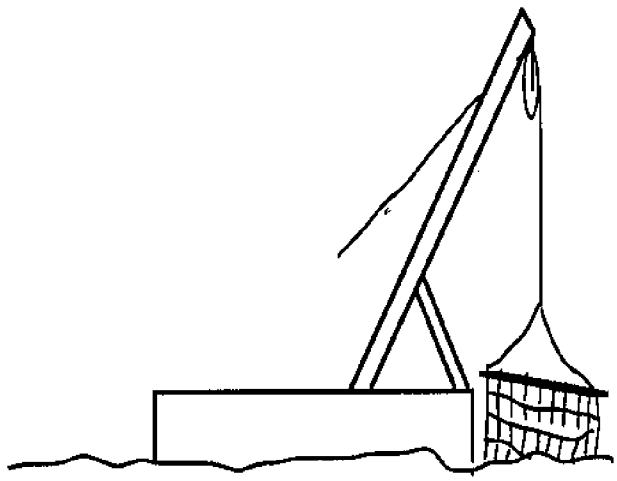
There are three methods for removing lobsters from your pound:

• Airlift Pump: This is the fastest but also the most expensive method. The suction machine works by pumping air into the end of a long tube which extends down into the bottom of a pound. A diver works the bottom, collecting lobsters and placing them into the end of the tube. The air bubbles being released into the end of the tube travel upward carrying the lobsters to the surface. The trick to this method is to keep the diver at the same pace as the packing crew on the surface. Oftentimes, the diver can overload the packing crew.

• Dragging (seine): This is one of the most common methods and when done correctly will result in very little damage. Lobsters are most often crushed or damaged when the work crew hauls the drag over the edge of the work platform. This damage can be eliminated by constructing a block that extends above and beyond the edge of the work float. The block functions to lift the drag clear of the float at which point it can then be gently pulled in and lowered onto the float. See diagram on this page.

Dragging is a five-man operation. One man drives the boat or drags the winch and four men pack. You could pack 80-100 crates in a day.

• Divers: Divers are often used to remove lobsters from pounds. The usual procedure is to send a diver down with a meshed bag connected to a line that extends up to the work station. Once the diver fills the bag, he will tugon the line and the surface crew will haul the bag



up. Some pound owners will drag their pound until they recover about 80 percent of their lobsters and then will use divers to collect 15 percent and will get the remaining 5 percent when they drain (may take two-three drains).

4. Removal of lobsters during cold weather.

You have to be very careful when removing lobsters from your pound on extremely cold days. Even a brief exposure to extreme cold can kill lobsters. If you want to remove lobsters on extremely cold, windy days, use a sheltered float with a heater in it and try to keep the open working side of the float to leeward (or cover the opening with canvas). A great place to store your crated lobsters while you are working is under the ice. You can do this by tying the crates to each other and pushing them under the ice. You also need to be extremely careful not to expose the lobsters to blasts of cold air when transferring the crates from the float to a truck.

5. Maintaining a murky pound.

When lobsters are kept in a pound during warm weather, they will develop algae growth on their shell. This is referred to as "grassing up." While "grassy" lobsters are perfectly healthy,

they are not very marketable. The best way to prevent algae growth on your lobsters is to keep the water in your pound murky. Murky water reduces the sunlight reaching your lobsters and thus, will reduce algae growth. During the spring drain, most pound owners back-drag their pound with a bulldozer. This stirs up the surface sediments and will keep the water murky when the pound is refilled.

6. Timing of removal of pounded lobsters.

Do not try to "shed over" your spring pounded lobsters. Pounds that have tried shedding over have lost over half of their lobsters. The time to start selling your lobsters is when the market wants them, and when you will get the margin you need to make a living. **It is a lot easier to sell lobsters on a rising market than on a falling market!**

You will know when there is a shortage in the market, because your phone will be ringing. You may want to hold out for a little while, but if you can get a good margin, don't wait too long, especially if it is late in the pounding season. A good margin for fall pounded lobsters is around $ 1.50/lb. If you get $1.00/lb., it should cover all your operating expenses including a mortgage. The remaining $ .50/lb. will be the return on your investment, provided you have a low shrinkage.

7. Drain-out and clean-up.

It may take about two to three drains to get out all your lobsters. When the pound is drained, you may want to remove any loose rocks. These rocks can get scooped up by your dragger and crush a lot of lobsters. Also, if you are getting ready to spring or summer pound, consider back-dragging your pound with a bulldozer to keep the water murky.

8. Pounding seasons.

- *Spring pounding* starts in May when the Canadian season opens. Most pounds spring pound with Canadian lobsters. Usually, the pounds will buy all male lobsters because Canadian female lobsters can egg out as chicks. Maine lobsters will not egg out until they are 1-1/2 lbs. Be sure to sell all your spring pounded lobsters before they molt, which is usually in early to mid-August.

- *Summer pounding* caters mainly to the air freight market. Soft-shelled lobsters are placed in the pound to harden and then sold for shipment to distant markets. You can usually get a lobster hard enough to ship within three-four weeks.

- *Fall pounding* starts in most pounds in September and will finish by mid-November. It is risky to pound lobsters later than this because they generally will not eat once the water gets cold. Lobsters need at least a couple of weeks to fatten up for the winter.

Additional copies of this manual are available from:

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