Fish stocking density

Having a lot of fish in your fishery can encourage anglers, but only if the fish are healthy. Too many fish can:

- help the spread of disease by creating more chances for a pathogen to find and infect a new host;
- reduce water quality by lowering oxygen levels and increasing the levels of toxins and suspended solids within the water;
- damage habitat by reducing the number of plants;
- increase fish stress through competition for food and space.

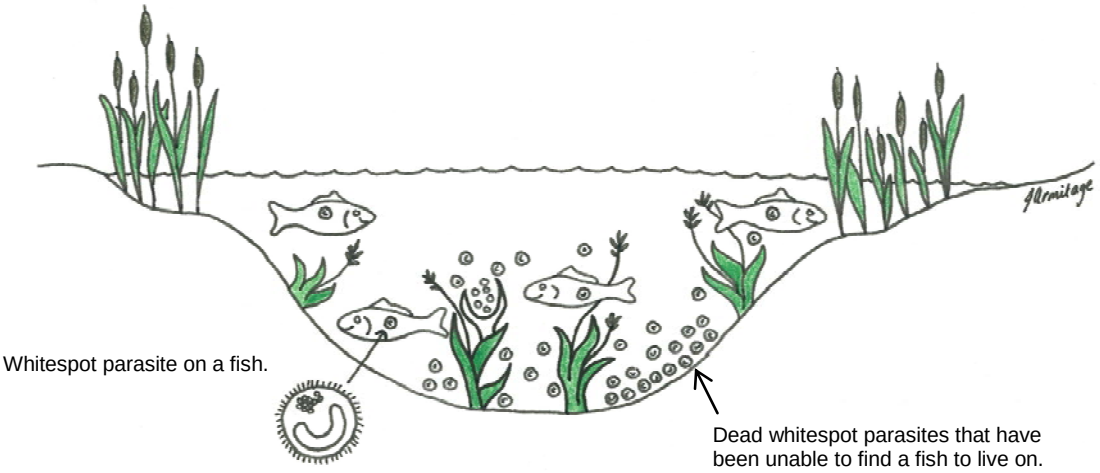
However, every fishery is different and can hold varying numbers of fish. There are no set limits as to how many fish can live in a water before disease problems occur. But obviously, the more fish you have, the greater the risk. However, there are steps you can take to reduce the risk of disease occurring by having too many fish.

Categories of stillwater fisheries	Average number of fish	Risk
Natural (fish populations maintained by natural recruitment)	~200lb of fish/acre	**Low**  **High**
Improved (fish populations maintained by natural recruitment and some stocking)	~325lb of fish/acre	
Intensive (fish populations maintained by stocking to maximise stock density)	~750lb of fish/acre	

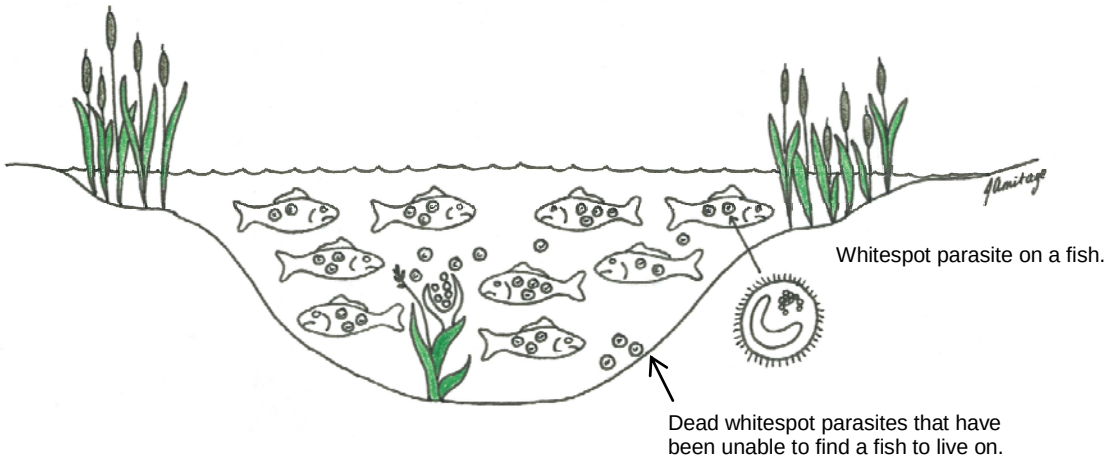
A guide to different fish stocking densities. The risk increases with the more fish you have.

How high stock densities help the spread of disease

A mixed species fishery with a very high stock density (~1000lb of fish/acre) started to lose large numbers of roach, rudd and bream. The deaths started during the summer when temperatures were high. The fish were infected with high numbers of the parasite, *Ichthyophthirius multifiliis* (whitespot). The high stock density meant that it was easier for the parasites to find a fish to live on. It also meant that the fish were more stressed, making it harder for them to fight off the infection.



In a fishery with a low stock density, it is harder for a parasite to find a fish to infect. The parasites that don't find a fish will die, so the number left in the fishery is kept low.



In a fishery with a high stock density, it is much easier for a parasite to find a fish to infect. The number of parasites that die because they can't find a fish is therefore lower.

High stock densities can therefore increase the number of pathogens surviving within a fishery. Regulating stock densities is therefore very important in controlling parasite numbers.

What's in your fishery?

The most important thing to know is how many fish you have in your fishery and how well they are doing. The anglers who fish your water will be quick to tell you how good (or bad) the fishing is, and this can be checked through match weights. But finding out how many fish are in a water is more difficult.

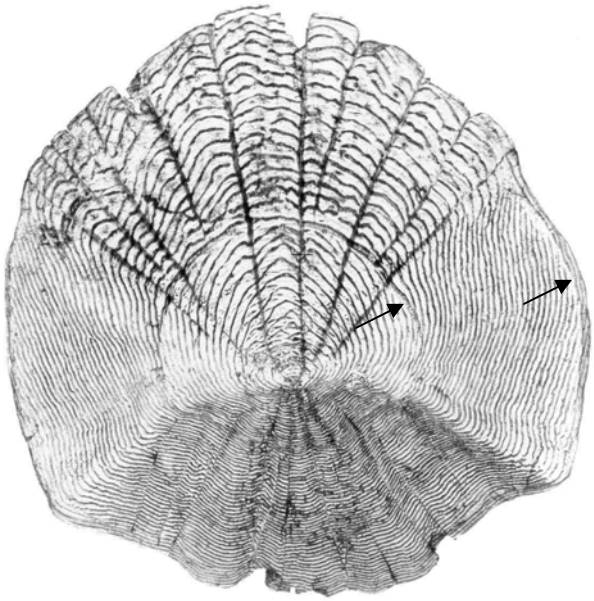
If you have built, or are building a new fishery, then you are in control of what fish go in. However, if the fishery is established or you are new to its management, then working out the stock density can be more difficult.

It is important to remember that stock density is not just about the number of fish that are in your fishery. It is also about how big your fish are, how well they have grown and whether they have produced young. Keeping a record of the number and size of the fish caught is therefore very important.

How many fish do you have?

You can find out how many fish are in a water using a netting or electrofishing survey, or by keeping a record of the fish that your anglers are catching. Surveys should be done by experienced fisheries consultants and can give you very accurate results.

Often a full survey is too expensive, or simply too difficult due to the types of habitat and features within the fishery (for example the fishery may be too deep, have an uneven bed or there is too much plant growth). In this case, angler catches can be monitored. Again, support from an experienced consultant may help you understand the results.



Using scales to age a fish. This chub was 2+ years old (annuli shown by arrows).

In both cases, fish scales can be looked at. This can tell you how old your fish are and, importantly, how well they are growing. Good growth is good news. This shows that the water is not overstocked and that there is enough food for the fish. If the fish are not growing well then it may be time to take action. Remember, if they are not growing, they may not be feeding.

If there are too many fish present, angler catches can drop before any sign of disease or decline in the fish is seen. In many cases, catches can be improved by removing some fish, rather than stocking more.

Managing high stock densities

Some fisheries do have high stock densities and don't have any problems with the health of their fish. For this to happen, you do need to think about how you manage your fishery.

Supplementary feeding

If you do have high stock densities then you may need to supplementary feed. This will reduce stress levels caused by competition for natural food sources. You do need to be careful though about what type of food you feed your fish. This is because high-fat diets may be bad for the long-term health of your fish. A balanced food source is always recommended and it is best to get expert advice.

Remember that the weather will also affect how your fish feed. In the winter, feeding may be unnecessary as the growth of your fish will slow and they need less food. Most importantly, remember that poor weather conditions also affect anglers. If the fish are having to rely on anglers' bait for food, and there are not as many anglers fishing as usual, then you may need to supplementary feed your fish. If you operate a close season on your fishery then you may also need to supplementary feed during this time.

Aeration

If you have a lot of fish, more oxygen will be taken from the water. Heavily stocked fisheries may need to aerate the water to provide more oxygen for the fish. There are many different ways to aerate a fishery but the aim is to increase the contact between the water and air. This allows more oxygen to pass into the water and will keep your fish healthy. It is therefore very important that you regularly monitor the water quality.

A fish survey by electrofishing.

Removing fish

If you do have high stock densities in your fishery and the fish are reproducing, then you may need to consider removing some of them. The number of fish that you remove and their size, won't necessarily change the current stock density. But it will stop it from getting any higher as the fish grow and start reproducing themselves. This is good fisheries management and will enable you to maintain your desired stock density without any further problems. Remember that removing some fish isn't always a bad thing.

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