

Select Aquatics of Erie, CO.

How to Raise *Big* Fish

Since I first started with an aquarium, keeping the domestically developed swordtails, guppies, mollies and platies, it always seemed that the guy with the biggest fish had the best fish, and was then was the best fish keeper. When you get more serious about keeping and showing your fish, size does matter. I have sat up far too many nights pondering this issue, as have most other fishkeepers that want great looking fish. What do I need to do to develop huge, honkin' fish?

I am going to tell you that my fishroom does not consist of rows of tanks filled with extremely large, "beefy" fish. There are some that are, but there being few is by choice. I have kept many Cichlids, barbs, danios etc. and explored raising them big as well as breeding them, but my general point of reference in this article are the domestic livebearers- swords and guppies, because my work with them has dictated the size tanks I use, etc. However, to raise any species up to its maximum size and health requires adherence to all of the same factors. There are a number of variables involved in this process, and many of them are standard good husbandry. There are also a number of "tricks" that some people swear by that may be valid, but are inconsistent and may not work for you. These practices are specific to developing size, and hopefully I will address most of them, some that you will not find in many of the pet fish books available to the casual hobbyist.

The overall heft of a fish also influences how large a fish is perceived. I had a friend determined to see how large he could get the swordtail, *Xiphophorus montezumae*, considered one of the largest swordtails currently known. He put 3 fish each in 2 bare 30 gallon tanks and stuffed them daily with *Daphnia*, dry food and brine shrimp. Normally, a big full sized *montezumae* will get to be about 5.5 inches. I have never seen one hit a full 6 inches, but rumors have gone around that they can reach up to 10 inches.

After a few months he had solid, big fish. He called me with a report, "Someone was looking at these fish today and estimates they are about 9 inches!" "Have you taken a picture?" I asked. "Oh no," he tells me, "I don't have a camera," "Then when they die, send them to me." I told him. "Wrap them up in alcohol and mail them to me, I'll preserve them and measure them for you." And he did. They were big, husky fish. And they measured almost exactly 5.5 inches, entire length including sword, but they were very deep bodied from having been well fed all of their lives. Things like this make me wonder about stories of red swords in the 60's that reached 6 inches, and that maybe those striving to grow fish back to what they are remembering from their youth are chasing an ideal that can't be met, because they were never really that way. I have seen mollies however, that may have reached 6 inches, grown by a fish farmer in Texas, but again, I didn't have a tape measure, and their most striking attribute was a thick, heavy body which may have made them look larger than they really were. But they were certainly very big fish. So size can also be what people think they see, even if it isn't entirely true.

Essentially, there are 7 factors. Water quality, Aeration, Tank Size, Foods, Temperature, Stocking levels, and Genetics. You will notice I list genetics last. Yes, it is a factor, but it amazes me how many see a big fish and have "gotta have it" (or a few of its young.) And then end up with fish the same size as what they had all along. Or people that create "horses" out of fish they bought at their local fish store. Genetics, though a fundamental essential component, is far from the entire picture.

I will address each of these variables as they apply to raising not only healthy, prolific and colorful fish, but fish that will get close to being as large as they can be.

The 7 Factors

Water quality: Each of these 7 variables is important, and I will make an effort to avoid saying that each is the "most important." But good water quality is essential, and there are many ways to accomplish this. To begin with, so that there are no opportunities for decaying organic matter to accumulate, I keep all bare bottom tanks, with floating or potted plants. Ammonia stresses the fish, and when you are going to be feeding a fish heavily to get it as large as possible, keeping a bare bottomed tank ensures that your water quality will stay as consistent as you keep it through variables you can control- water changes, changing the filters etc..

The most essential is water changes. I have experimented with different amounts at different time intervals, and have found that 50% twice a week is good, and about 10% a day is best. I know hobbyists that do 50% every day. I used to think that you could harm the fish if you changed too much, that more than 50% would deplete the bacteria etc. to a point to do harm to the fish, but that is not the case, particularly if you water that has been allowed to sit for a few days. If the changes are done regularly, and the water introduced is close in temperature and dechlorinated, there will not be a problem. The problem comes when you slow down or stop the changes, and the effect that this will have on the fish, which may not respond well until they adapt. If you change huge amounts infrequently (approx. more than 50% once a week) there is an adjustment from "old" to "new" water that the fish are required to go through, and you may introduce stress issues that you did not have previously. It is best to change water consistently both in amount and time between changes. With a tank where I was setting out to grow the biggest fish I could, I would change at least 50% twice a week, 10-15% a day is better.

The thinking with raising big fish is that you want all of their energy to go into growth, not fighting other stressors or expending their energy in other ways.

One secret to big fish is starting off the fry as well as possible, setting an initially strong, consistent rate of growth. With new babies in say, a 2 gallon tank I change 50% of the water daily for the first 2 weeks to a month, or hang the babies in a net breeder in a much larger tank with just a couple of fish swimming below. They then eat the baby brine shrimp and dry food that falls through the netting. The frequent feedings and brine shrimp will foul the water quickly in a small 2 gallon type baby tank, and until they are big enough to fend for themselves extra effort needs to be put in to keep the water of high quality during those all- important first few weeks- the net breeder hanging in a much larger body of water solves that problem.

Keeping them in the breeder for the first 10 days to 2 weeks means that you can keep an eye on them, and they will be less likely to miss food when it is introduced into the tank. When time comes to release them, remove any other fish, and they will already be acclimated to the water conditions in that tank. Be aware that keeping them too long in the breeder will also stunt their growth- as soon as they can fend for themselves confidently- no less than 2 weeks, assuming there are no other larger fish in the tank, they should be released.

I understand this sounds like effort, even work. Water changes are extremely important, so find ways to make it easy for yourself. No one should be expected to be sucking on hoses and schlepping heavy buckets around on their weekends. (But most of us do). I currently run about 60 tanks and have made a PVC network that goes into every tank and the entire room receives a daily 10% water change, automatically, in 6 zones, in about a half hour, both filling and draining. The plans for this PVC setup can be purchased by emailing me, and this setup requires no drilling of tanks, pumps or sumps.

The second water quality issue for growing large fish is to keep the fish within the water quality parameters they are best suited for. I used to live in a city where the water coming from the tap was a pH of 8.2. It would not have been possible for me to get the best growth from South American Cichlids in those conditions, for they require water that is ideally far more acidic. But the African Cichlids did great in that water. Read up on the fish you want to keep, and keep species that will do best in your water. Paying to add chemicals to alter either the pH or hardness with each water change can be very expensive, and inconsistent from the fish's point of view. Trying to grow out a fish that is a close match to your water is the best path to success.

Aeration: This is an important variable in that it can have a profound effect on the immediate health of the fish. It is important to research the type of water conditions that the fish are accustomed to in the wild- some species are native to faster moving streams and would require more aeration, and possibly cooler water, as a matter of course, some do not. With respect to growing larger fish, I have seen large fish produced from many types of aeration. I use box filters with small stones and polyester floss in my tanks, and feel that the moderately rough aeration they provide works well for the fish that I try to grow their largest- primarily the swords. I have seen fish that were kept just to produce size that were raised without aeration (and kept to just a couple per large tank) that ended up huge and "beefy." The thinking was that their energy went into growth and not the swimming activity that turbulence in the water would require. As a result, my fish tend to be sleeker from the activity that they encounter, and not as heavy bodied. Some might say they then aren't as large, and they might be right. You can actually produce "fat" fish, and you can get them pretty large, but the males are occasionally sterile from "fat testes" syndrome (I am not making this up!). Essentially, I am of the opinion that a big fish should also be a healthy fish.

I have also heard from some breeders that they will introduce a fair amount of aeration to new young so that they are forced to swim vigorously to survive, and then feed heavily with the premise that this would encourage the biggest and strongest fish. It is an interesting idea, but I would prefer to evaluate each fish when they are older, and make the effort to bring all of the young into at least adolescence (except those with obvious defects) as carefully and as gently as possible, with their energies during that period in their lives focused on growth.

The goal is to create a world for the fish where their life energy is not being expended for anything other than getting larger. A tank where the oxygen saturation or pH has been affected because it is dirty means the fish must navigate those obstacles just to survive. It won't be putting its precious resources into growth. A consistent airstone or box filter will help to keep the bacterial levels up to keep your ammonia levels down, and combined with vacuuming up any excess food will create an environment the fish need to grow

Tank Size: The size of the tank, though important, matters less than you would assume, provided the water quality stays high.

It is much easier, however, to maintain higher water quality with a larger tank, particularly when there are only a few fish in the tank. You will be putting larger amounts of food into the tank than you normally would to encourage a lot of growth, and you do not want the water quality to deteriorate. So if you are setting out to specifically raise large fish, your best odds at success will involve a larger tank than you would normally provide for the size and number of fish you will be working with. As in the story above, my friend chose 2- 30 gallon tanks for 5 fish, the greatest number of fish he felt he could provide with the smallest tanks that would meet his needs.

When choosing a tank the factors to take into consideration were those my friend considered. With a fish he thought would get to be 6 inches+ he chose a tank where the water quality would stay high with heavy feedings, but not so big that the fish would ever miss finding food that was put into the tank. Next he had it filtered so it stayed clean, but left outlet and air stream turbulence at a level where the fish weren't pushed around having to fight the current. He deliberately set out to produce fat fish. Then he made sure that they were all the same sex, so that the males wouldn't spend their energy chasing females as they matured. He provided modest light so they were comfortable and as unstressed as possible, then fed them 4-5 times a day with as many types of live and dry food as he could come up with. If I were to decide I wanted to raise a big Oscar, I could easily see myself keeping a single individual in a 100 gallon tank. If it were guppies I'd keep a half dozen in tank of 10 or 15 gallons.

Which brings me to myths about tank size. A fish does not stop growing as it ages, its growth is only limited by its genetic makeup, diet and the oxygen level in its environment. A fish known to grow large but put in a small tank and fed less will not mature into a smaller size fish because the tank limits its growth. That fish may stay small because it simply isn't healthy and its growth is limited by its poor diet and lower oxygen levels. It won't live as long, and will not outgrow its environment only because it will die first. For example, a baby Oscar will do just fine in a 10 gallon tank. Within its first few weeks it will outgrow that tank heading toward the 12 inches or so they normally grow in captivity. It will die within 6 months if not moved to a larger tank, maybe a third the size it would normally be by that age (when they normally live to 10 years). If moved to a 30 gallon, that Oscar may live a full lifespan, but will be cramped, and due to water fouling won't be able to be fed the amounts it would normally ingest in a proper sized environment. As it reaches maturity it may reach a crowded, lonely 6 inches in that 30 gallon and die of what appears to the fishkeeper to be old age, at 3 to 4 years old. A single Oscar in a 50 gallon approaches what they require and will live out a full life. However, a second Oscar in that tank reaches the fish's minimum tank size requirement, and if you were to try for a 3rd, you'd need to go once again to a larger tank. Smaller fish may reach their full size in a large aquarium, and won't get any larger than it normally would when raised as a healthy, well fed fish. In fact, smaller fish in bigger tanks can lead to fish not finding the food, or stress the fish if there are not hiding places and sheltered areas provided. Raising guppies, for example in a 50 gallon tank when there are only a few fish does not lead to a few large individuals.

Also keep in mind that most aquarium fish are rarely grown to their potential when it comes to size. Most fish you see being kept in people's aquariums are undersized for no other reason than that much of the commercially available fish food is inconsistent, bland or is often used past its nutritious prime, when live food is essential to maximum growth. Most fish have the potential to grow much larger than they do in home aquariums or pet shops.

Foods: Can you raise truly big fish without live food? Well, sorry, but no. There are a number of alternatives, but a variety of live food, and lots of it, are best. Before I go into those alternatives, I will share my experience with live foods.

As a given, you will need to hatch baby brine shrimp (BBS). There are a number of alternatives marketed recently that claim to be nearly as good, and these are generally fairly good products. However, the serious breeders that I have dealt with all use BBS, particularly to feed young fish. Some breeders will actually feed up to 10 times per day, small feedings, as that will contribute to growth better than one or two big feedings a day. I feed young 3-4 times a day, twice brine shrimp, once or twice a fine mix of dry food. Adult fish are fed twice a day, once live food if available, and once dry food.

I have tried a wide variety of live food with varying amounts of success, but for me the easiest to raise (other than brine shrimp), with the least chance of spreading disease to the fish, least smelly etc., are redworms. (small earthworms). I keep them in moist, pure Canadian peat, feed them egg laying mix chicken feed crumble, and they reproduce quickly. The drawback is that they need to be chopped up to be fed to the fish. Occasionally I am haunted by thoughts of one day meeting all of the thousands of earthworms I have cut up in my life, but the fish love them and they are one of the best balanced foods available. The size of your broods will increase and they definitely contribute to large fish, regardless of species.

There are many other types of live foods; white worms, fruit flies, microworms, vinegar eels etc., and I have kept them all with various amounts of success. Many stores also sell blackworms which are excellent, and tubifex, which I generally avoid due to the number of diseases and various flukes the cultures are often contaminated with. Frozen brine shrimp is also commonly available, and there continues to be much discussion over the nutritional value of adult shrimp. My advice is to try it and see if it does what you need for it to do. You may also choose to go to the internet to read some of the literature available before using it. When raising fish to be as large as possible, generous feedings of a quality, fresh dry food, frozen brine shrimp, and chopped earthworms with feedings of at least twice a day will certainly give you the results you are looking for.

With respect to dry food I keep all of my foods in the freezer, and feed a high quality staple flake bought online mixed with a vegetable flake. There are foods sold in the pet store that are fine, but I choose to order by mail because I use it in fairly large quantities and I know it will be fresh. When fish are fed the same brand of food for a long period I will often add an attractant, something they really like that when mixed in will cause them to eat more than they normally would. Brine Shrimp Direct's "Golden Pearls" (rotifers or other small animals prepared into a fine powder fed primarily to younger fish) works well for this. Now I have seen an exception to most of what I'd just written regarding live food and size. I had a retired friend in his 80's

with a 20 gallon tank I kept stocked for him with swordtails and a couple corydora catfish. The tank was set up directly next to a chair where he sat much of the day watching TV. I know that his younger wife did at least a 50% water change once a week, and occasionally siphoned off excess food from the bottom. Each time he sat down, or whenever he thought of it (which became far more frequent as his short term memory diminished) he fed the fish from a container of dry food placed next to the tank (and the TV remote). These fish were easily being fed 10-20 times per day, but they received no live food. And they got large. But they were also fat, out of shape, crowded and rarely dropped fry.

Temperature: Fish raised at higher temperatures grow quicker, have shorter lifespans, reach sexual maturity sooner, and may not get as large. Fish kept in cooler temps are affected in all of the opposite ways. However, at cooler temps some fish could be more prone to disease.

I have found that settling on the proper temperature for any particular species depends on the temperature that is known to be optimum for them, keeping an eye out for where they appear to be at optimum health. You may also find that fish into their 2nd, 3rd or 4th generation for you will be more adaptable to your setting a temperature at the natural level for the species, which may be different than the temperature the fish were raised in previously, particularly if they were obtained from a local fish store. An example are the colored swords available at most pet shops. They are generally kept between 75 and 80 degrees, yet the temperature the species they were developed from are accustomed to is closer to 72. But if you were to take a newly purchased adolescent fish from the fish store, and immediately put them in 72 degree water you may encounter ich or fungal infections. Most home aquarists keep their tanks at 75-80 degrees, and when all species are adapted to that temperature, then many varieties can be kept together without temperature concerns, so most pet shops keep their tanks at 75-80 degrees. I generally keep my tanks containing domestic X. helleri swords at about 70-74 degrees. When I am raising them to become their largest, it is best that I slowly adapt any fish accustomed to the higher temperature down to the lower temperature and grow them out there, for that is where they should be the most healthy.

An exception to this are new young. I generally keep them at warmer temps (78-80), for the first 2 to 3 weeks to get past their fragile first few days as quickly as possible with as aggressive a growth pace as I can, then I bring the temp down as they mature.

Stocking levels: How many fish you try to keep in a particular amount of water will have a direct effect on the size of the fish you will end up with, addressed earlier in the Tank Size section. The fewer fish in the tank, the more resources that are available to each individual fish. The water stays cleaner, food is more plentiful without clouding the water, and each fish expends less energy interacting with others for dominance, competition for food, etc. My biggest fish have come from tanks of 10 gallons or more that contained no more than a couple fish. I have seen some larger livebearers raised for size that were kept at 10 gallons per fish. Generally, the "one incher per gallon" rule seems to apply fairly well for fish smaller than 3 inches. It is best to have them kept same sex, or one male to two or 3 females to keep the amount of sparring between males to a minimum, but same sex is better. I have observed often that when two tanks are kept next to one another, using Guppies as an example, with a divider between them so one can't see the other, and one is mixed sex and one is males only, the growth difference between the two groups at 4 months is dramatic. The same sex males will far outpace the growth of the males in the tank being kept with females, for they spend much of their energy sparring with one another over the attention of the females.

In all of my tanks I strive for as natural an environment as possible for the fish with generous floating or potted plants (no gravel) high quality water and generally low stock levels. If it were possible for all the fish in my room to lose their sense of confinement by the tanks being large enough, the fish being at low enough stocking levels and the water being of high enough quality I would, and that certainly leads to colonies that are large and robust.

I have not seen studies demonstrating that fish will inhibit their growth when in close proximity to other fish within a confined area when the water quality, food etc. remain excellent. There was an article in one of the fish hobbyist magazines written by someone that had just exactly that, eventually raising an absurd number of fish (pet shop swordtails) in a very small tank, but with massive, multi day water changes, claiming the fish still grew to full size. But stress is probably the greatest strain on long term good health, and crowded conditions are stressful for any fish. Increases in population begin to require greater and more frequent water changes, depending on the number of fish you have, which become less effective the more food you need to add. I believe it is best, and less stressful on the fish to simply maintain fewer numbers in larger amounts of water, particularly if you want fish that are going to grow at their maximum rate.

Genetics: This is the "wild card" that most people pin far greater hopes on than they should. Because someone has a large strain of something, and they give you young, it doesn't mean you are going to get fish as large as what they have. Likewise, it is not any guarantee that fry from smaller individuals in a species will produce large fish. The genes are either there or they are not. The genetic makeup of any fish will not change in a generation or two. In most instances, your attempts to raise large fish from a specific line will produce larger fish than you expect, for the effort and practice to do it right is often not followed. I recently obtained a line of guppy that was beautiful in its finnage and color, and appeared as robust and healthy as I could have hoped for. But I had seen fish of that same line in other places, and they were much larger. I wondered if there had been developed a number of lines, some smaller than others. The difference between the fish I received and what I had seen was dramatic. What I bought were well maintained fish from a reputable breeder (who charged me as much as they cost anywhere), so I made the assumption that they were as large as they could be. I was wrong. I called around, and no one knew enough about these fish to say whether they had seen different sized strains, or that this line could be variable. So I decided to see if I could improve on the size of those first individuals, making an assumption that the genes were there, and the previous breeder simply hadn't raised them to their potential. By the second generation they had increased in size by over 50%, and by the third generation (through careful choosing of breeders) they were where I had felt they should be.

This also applies to pet store fish. The commercial breeders make every effort to develop a strong hardy stock that will get large and sell as many fish as possible. But from the time they leave the commercial breeder's ponds in Florida or Singapore, the young fish weren't fed, or have been on occasional feedings of dry food until you bring them home from the local pet store. The genes are there, but the fish may not be particularly large or robust in appearance. I have had friends that have taken "bread and butter" pet-shop quality swordtails and put them out in ponds with heavy feeding to create truly large fish with color they did not know was possible. A careful choice of breeders for the next generation, and you end up with a great fish that can demand a fair price from other hobbyists.

I knew a discus and angelfish breeder that advertised that he had angelfish that were a "super-sized" line. In his ads he claimed his angelfish got to the size of "dinner plates." So I went to visit his facility. He had about 100 large tanks in a built-out garage, and his angelfish were indeed large. (I felt the dinner plate claim was a little much, however), but they were big, robust angelfish, and he charged absolute top dollar for them. He kept them in very high percentage RO (reverse-osmosis) water and fed lots of live food many times a day. I asked him if these angels were a mutation he'd come across, or a fish that had been developed over many years by another breeder. "No," he said. He then told me how he had bought them in a pet shop in San Francisco. He liked them, fed them well, put them in big tanks, and voila! "Dinner plate" sized angelfish. One big problem he had, however, and he soon went out of business in part because of it, was that for him to get the maximum size from his fish he used RO water, so that diseases and biological contaminants could not challenge the fish, helping to get the fish slightly larger. People buying his fish trying to raise them in regular water found that they didn't last long. I bought a few, and they were all dead within a month.

It is generally agreed that when a male swordtail reaches sexual maturity (its caudal extension- the sword, has grown out) that an individual's growth toward becoming a substantially larger fish generally stops, and many species of fish are similar. Once sexual maturity begins, growth slows down or may even stop almost completely. The fish that become largest are those that mature the latest. Many livebearer populations will have males that will mature earlier, and their presence continues because they are able to mate earlier and continue that early development trait. Some populations produce smaller sized males within the same species because of this. These early maturing males are an evolutionary adaptation, and have even developed a breeding strategy of sneaking up on females and inseminating them without the courtship rituals the fish generally exhibit. One of the advantages of keeping fish in same sex tanks as they grow out you can spot the earlier maturing fish and isolate them. Males that are not raised around females also grow larger as their energy is not spent attempting to mate, and there is not the incentive to reach maturity earlier in competition with other males to produce young.

It is also a common belief that larger alpha males in a tank will release a growth inhibitor into the water that inhibits the growth of other males in a tank, giving them a reproductive advantage. This is believed to be another reason that frequent water changes are a must.

At the same time it has been suggested that young raised around larger fish will tend to grow larger more quickly to develop a competitive advantage for females. There does seem to be some truth to that, when large water changes are routinely done to address any growth inhibiting hormones that may be released. (and to my knowledge, though widely believed to exist, a growth inhibiting substance released into the water has never been identified). I tend to think that much of both beliefs may be no more than subjective assumptions.

One other factor that arises in many animals, that I have seen (rarely) in fish, is that occasionally a particularly large fish will appear in a batch of young, one that you may feel is beyond the normal scope or range of size for that species. You raise it up, and it appears to be the holy-grail fish you had been hoping for, only to find that it simply won't breed. There are instances where a large fish- actually a mutation for size, will come about, only to find that it is sterile. You can do a couple things. I would separate the female that dropped the batch he appeared in and breed her as often as possible, with the same male if possible) to see if you can produce more of those mutations, in the hope that eventually one will be fertile, or keep the siblings of that fish separate, keeping an eye on their offspring to see if the mutation reappears.

I have also found that the fewer times that fish are moved contributes to more stability for the fish. They do respond to this by showing a lower incidence of disease and consistent growth. I understand the need to move fish as they grow, but I will put fish that are big enough to get around and find food (approx. 3-4 weeks) from a 10 gallon into a large tank (such as a 30 gallon), and leave them there until they are put into single sex tanks (guppies are ready for same sex tanks at that age). There they will stay for the remainder of their lives with the exception of those chosen as breeders or to be sold.

There are other techniques to grow fish their largest that that can be beneficial, and that you may want to try.

-Keeping lights on 24 hours. This makes sense; fish will spend a greater portion of their time awake and growing. To

hold down on algae growth or an increase in temperature you can choose to use low wattage bulbs. I currently don't do this but know of breeders that insist upon it. The thinking is that the fish will sleep when it needs to, otherwise it is kept awake and growing.

-Using salt in the water. Salt has its advantages in that it will hold down your incidence of disease at approx. 1 tblspn. Per 5 gallons. Most livebearers tolerate salt well, and providing a prophylactic dose of salt helps encourage healthier growth.

-Plants. I use plants in all of my tanks for the shelter it provides the fish and the effect plants have to keep the fish calm, to reduce ammonia and to assist gaseous exchange. Najas Grass, Java Moss, Java Fern, Watersprite, potted Amazon Swords, and various crypts and ferns are my favorites.

-Bare bottom tanks. I use all bare bottom tanks. The tanks are cleaner, easier to maintain and the removal of fish from a tank is easier.

-In a perfect world find a way to keep a live food alive in the tank that the fish can feed on whenever possible. I raise daphnia and keep them in my fry tanks, where they will live for days producing young the fry can feed on. I will often put 3-4 inch sand filled plastic containers in a fry tank, seeded with blackworms to graze on. They will stay rooted in the sand waving in the water column, and will eat powdered fish food.

-Being realistic and patient. This takes time, and you may try with more than one group of fish before you hit your stride and the fish begin to start looking as you expect them to.

So, to raise large fish;

Find young fish from healthy, ideally good sized parents.

Put them in a single species, bare bottom tank of at least 1.5-2 gallons per fish to start, at 75 degrees, some floating plants, at least 12 hours of light and fair aeration. As they become about 1" move to 10 gallon or more per fish (depending on species). Strong filtration with modest air movement (depending on species) should be provided. Keep at cooler temps of natural range for greatest size.

Water quality is everything. Do frequent water changes of at least 50% weekly, smaller amounts at frequent intervals is better than large changes done infrequently.

Feed often with good quality food, starting with baby brine shrimp immediately, look into supplementary live foods. Clean bottom often to prevent mulm buildup.

And there is one last thing. To give an extreme example, if you were to set up one tank with one fish and do all I mentioned, yes, you may get a large fish. But always set out with as many as you can provide for, giving yourself the best odds for success. Some individuals may be genetically or constitutionally predisposed to be smaller fish, regardless of what you do. And above all, spend the time first putting together a program, system or approach so that it is all as easy for you as possible. And though I would like to say "Good Luck", hopefully I have shown that luck has very little to do with it!

Greg Sage
selectaquatics@gmail.com
selectaquatics.com

[Back to Downloads Page](#)

[Home](#)

[Species for Sale](#)

[Fishkeeping Tips](#)

[Receiving and Shipping Fish](#)