Vegetative cover, in aquaria, has a great number of beneficial attributes and very few drawbacks. First, and in my opinion foremost, of these positive features is an incredible reduction in stress for the residents. Directly, the physical structure of all aquatic plants reassures animals by providing cover for them to hide in. The result is that the animals feel more secure and hid less. Floating plant cover provides structure of this nature only in its root system, but contributes in a unique, indirect way. Aquarists can easily vary light levels in the aquarium by controlling the density of plants at the surface. Nocturnal species are especially appreciative and will be more inclined to be active during the day.

Secondly, floating plants act as a biological indicator. This means many things; that they take up nutrients and thereby polish the water, that they respire and, depending on the photo period, use carbon dioxide (CO_2) or oxygen. By driving CO_2 levels down and up, plants can cause pH to swing up and down. Also it is implied that; the plants will grow and spread and that they will be susceptible to certain environmental deterioration which would otherwise exhibit no visible symptoms. In other words, the plants will be healthy and grow or they won't. Astute aquarists can glean some knowledge from such events, but I must caution that different species of plants have different requirements as well as different tolerances to things such as salt. A comfortable familiarity with the culture of the particular plant is recommended prior to applying any conclusions. Bio-indication presents a new dimension or gauge on that microcosm the aquarium.

Floating cover is also extremely useful in the elimination of losses due to jumping. Most species of floating plants will accomplish this so long as the density of plants is sufficiently high across the surface of the water.

DUCKWEEDS

Duckweed is any one of several species of floating plants of the genus Lemna. Although the world's smallest flowering plant, most propagate vegetative (they don't flower), and are extraordinarily small, appearing in great quantities. Duckweeds prefer stagnant water in nature with a high level of nutrients and nitrates. Typically, if introduced directly into the aquarium they would bring many parasites with them.

In the aquarium this group of plants does very well and has to be thinned out with a net often to prevent it from blocking all surface area which would severely limit gas exchange. Duckweed is relatively tolerant of low concentrations of salt.

More than a few species of medium to large fish relish duckweed as a food source. Those tanks which won't sustain a crop of duckweed because the fish eat it faster than it can grow will help to dispose of some of the excess from other tanks.

AZOLLA

This is a group of small floating ferns which do not usually do well in the standard aquarium. Some could do well if provided with exceptional lighting.

SALVINIA

Salvinia is another small species of the floating fern, but one which does well in a standard aquarium. The almost circular, flat leaves bristle with protective hairs. This plants develops a relatively large root structure when compared to either Lemna or Azolla. As viewed from below, this root structure makes for a desirable display affect or is useful as cover for small fishes.

Although Salvinia does well and is tolerant of salt, it is less suitable because of its characteristically dense, light-blocking cover. This plant is so thick and gets so dense as to inhibit viewing screening all light. No aquarium fish seem to be capable of eating this plant but they may nibble at the roots.

RICCIA

Crystalwort as it is called reproduces vegetative under aquarium conditions and forms dense, interwoven mats or balls. The shade of green seems to be dependent upon the culture light levels.

Riccia's outstanding point is its particularly fine and incredibly dense cover. Perfect for small fry and bubble nest builders, this species does not tolerate strong water movement or vegetarians very well. Cichlids, and other fishes, will tear mats of Riccia apart and frequently eat the plant.

WATER SPRITE

Ceratopteris is a fast growing, acid water, floating fern which exhibits itself in three basic forms: an aquatic broad-leaf variety; an aquatic fine leaf variety; and an immersed form (possibly one form for each aquatic variety), which can reach 50-100cm in height. Typically, these larger plants have rooted themselves in shallow water, but they do not need to. The immersed fern unfurls very rigid, narrow fronds which appear more like stems then leave. With time and good conditions, both aquatic varieties develop their own immersed forms, even while floating.

As viewed from below, all forms grow a root ball almost as large as the plant's body. This root ball can be invaluable for spawning tetras and the like. Although, the leaves are very brittle it is not generally a problem except when trying to transport a large plant intact. Any leaves which

snap off will sprout several new plants.

SUMMARY

Benefits

1. Marked reduction in stress level of inhabitants due increased cover and reduced light

levels.

2. Biological indication takes a look at the larger picture overlaying compatible organisms and c omparing their health’s to on-going events.

3. Improved water quality results as plants perform their job as it pertains to the nutrient cycle.

4. As a constantly available dietary supplement, Lemma is fed upon throughout the course of the day, especially between feedings.

5. The effective elimination of all losses by jumping.

6. A myriad of reproductive uses (nests and fry), as well education and display.

Drawbacks

1. Animal respiration requires oxygen. Excessive plant cover will reduce the effective area of air-water interface causing abnormally high or low partial pressures of CO_2 and oxygen, this in turn can affect pH.

2. Plant respiration, under prolonged conditions without light, can also use up available oxygen. This is not a common problem but one which could arise under extreme conditions.

3. The mess. In my mind this is really not a problem at all but I'm also aware that many would disagree. Having to rinse duckweed off nets and pails has become habit and is not a source of anxiety for me.