

Spawning Aggregations

by Richard Barnden

A Spawning aggregation is a group of fish that temporarily gather at higher than normal densities for the sole purpose of reproducing.

In the mid 70's Robert E. Johannes a tropical marine ecologist came to the islands of Palau and pioneered the idea of integrating local knowledge from fishermen with Western concepts of management and applying it directly to resource conservation and fisheries management.

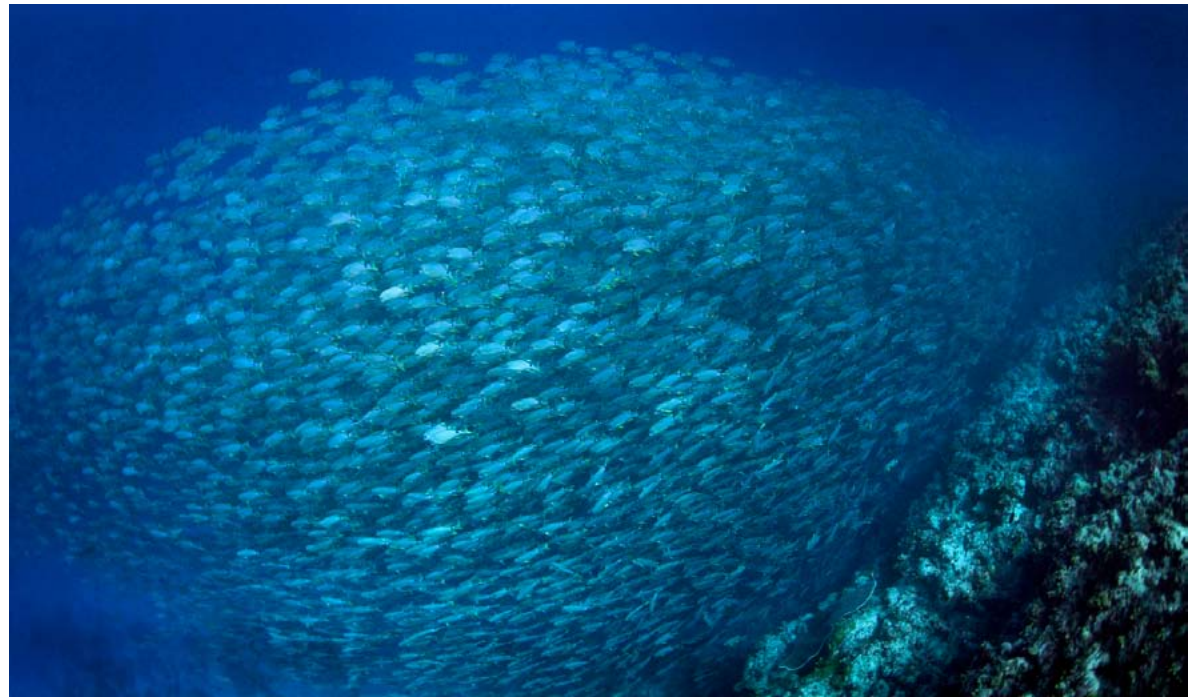
Local knowledge of lunar cycles and spawning aggregations is invaluable for the protection of breeding grounds which would rarely be discovered without knowledge from local fishermen. Johannes pioneering work and the help of local communities later went on setting up fishing 'closures' of particular species of fish around their spawning aggregation cycles. These are still in force today.

Not only locally enforced policies make Palau such a unique and special place for spawning aggregations. It has Marine lakes, rock islands, mangroves and a large lagoon making it a perfect

place for young juveniles to grow and survive away from the dangers of bigger reef dwelling predators. Where they too can one day join others in a spawning aggregation.

Palau's regular southern lagoon dive sites are in a relatively small area compared to other diving spots where hundred's of miles are covered in a single week live aboard trip. As a dive guide this has its advantages. Diving the same sites day in, day out, month in, month out you get to familiarize yourself with each dive site. By keeping strict logbooks each day and having an eye to notice large aggregations of fish turning up on regular occasions you start to notice patterns emerging and can start building up a database of possible spawning events happening around moon cycles each year.

Only a few dedicated dive shops so far have the knowledge of lunar cycles and tidal times to be able to practically guarantee such events.



After Spawning the huge school of Blue Lined Sea Bream (Symphorichthys spilurus) moves up the reef wall together, where they will aggregate and rest waiting for the following days spawning time. Nikon D800, Nauticam Housing, 16mm Lens, ambient light, f8.0 1/160, ISO 200

Unique Dive Expeditions, a product of Sam's Tours, offers educational expeditions targeting spawning aggregations around lunar phases, a new kind of style of diving. After spending the last five years studying these aggregations there are so far three regular spawning dives achievable, other aggregations are being studied but the combination of spawning at night or beyond recreational limits makes it logistically hard.

Each species of fish has its

own spawning patterns and styles and follows its own spawning lunar phases. Some aggregations will spawn every month like the Twin spot snapper (Lutjanus bohar) and the Bumphead parrotfish (Bolbometopon muricatum). Other aggregations will only spawn once or twice each year like the Blue lined sea bream (Symphorichthys spilurus).



As the school prepares to spawn color changes (sexual dimorphism) can be seen between males and females. Darkish black colors and a lighter whitish colors are displayed. It is unknown at this stage which is male and female color changes. Nikon D800, Nauticam Housing, 16mm Lens, Sea & Sea YS-250 Strobes, f8.0, 1/80, ISO 400

The Blue Lined Sea Bream - (Symphorichthys spilurus)

During the months of March, April and sometimes May these strange but beautiful looking fish form one of Palau's largest recorded spawning aggregations to date. A rarely seen fish on the reef these normally solitary fish hide inside the lagoon or on deep sandy drop off's, feeding on crustaceans hidden in the sand and normally away from the eyes

of divers.

As their spawning season approaches individuals start gathering in two main areas of Palau. One in the North West side called Tailtop and one in the South, around the island of Peleliu.

This aggregation can reach up to 50,000 fish and just seeing the size of the school when its together can be more impressive than the actual spawning event itself.

When the correct formula of



A group of divers descend just above the huge school of Twin Spot Snappers (Lutjanus bohar). This school can have more than 5000 individuals each month returning to spawn. Nikon D800, Nauticam housing, Ambient light, Nikon 16mm lens, f8.0, 1/125, ISO640.

month, day, tide and time come together the Sea Bream are ready to spawn. The school moves from its aggregation area to an area with current, taking their gametes to safety. From 60m to 15m the school becomes a tight mass of yellow fusion and the fish begin spawning. Bullsharks, Blacktip sharks and often lemon sharks are seen slowly swimming through the school waiting for a tired fish to pick off.

The Twin Spot Snapper - (Lutjanus bohar)

Also found in Peleliu and on other outer promertries in Palau, these fish aggregate around full moon. Schooling in mid water in the day, this impressive school looks like a dark cloud as you approach it. Between 5000 and 10,000 fish depending on the month can be seen schooling and spawning here.

Just as the sun rises you enter



After aggregating for a while, the school of Twin Spot Snapper (Lutjanus bohar) rises close to the surface in a rubbing type of ritual, moments away from spawning. Nikon D800, Nauticam housing, Sea & Sea YS - 250 strobes, 17mm lens, f8.0, 1/125, ISO640

one of Palau's notoriously strong current dive sites. The reef is barely visible as the dark cloud of snappers appears in the distance. Waiting on the reef for the exact moment you watch as bullsharks and blacktip sharks parade around its outskirts.

Suddenly the spawning erupts, all hell breaks loose as multiple females shoot to the surface, with males on the chase releasing their milky gametes into the water column as what seems to be aggressive reproduction.

Visibility goes from 30m to 3m near the surface and hungry black snappers are crazily feeding on the newly born youngsters. Drifting in the blue water doing your safety stop with the lucky snapper survivors you realize you just witnessed one of nature's magic moments.

The Bumphead Parrotfish - (Bolbometepon muricatum)

One of the most recent spawning



Spawning begins as a group of Twin Spot Snappers (Lutjanus bohar) breaks off and releases its gametes (sperm and eggs) into the water to carry on the continuation of their species. Nikon D800, Nauticam housing, YS - 250 Sea & Sea Strobes, Nikon 16mm lens, f8.0, 1/125, ISO640.

aggregation discoveries is that of the Bumphead Parrotfish.

Hidden on the West side of Palau lies a sandy slope perfect for the continuation of one of the oceans friendliest green giants.

Scientists and divers knew little about their reproductive behavior until Blue Marlin divers found the ground breaking site. This is the biggest bumphead aggregation so far discovered on the planet. Most divers would be lucky to have witnessed a

school of a hundred feeding around the reef, here you can see more than a thousand displaying color changes, males banging heads and a thousand fish spawning, truly a magical site.

Early in the morning the school starts to form on the shallow reef top. One by one following each other from the shallows out onto the reef top like a waterfall, the aggregation begins to form. Hundreds turn into a thousand and the reef starts buzzing ready for a show.



A group of Bumpheads (Bolbometepon muricatum) begin to spawn leaving a trail of white, milky gametes (Sperm & Eggs) in the blue water. Normally only one female will be clustered by a group of eager males. As both male and female look very similar it is quite hard to establish which is which Nikon D800, Nauticam housing, 10.5mm lens, ambient light, f8.0, 1/125, ISO640



As the school of Bumphead Parrotfish (Bolbometepon muricatum) swims off the reef into the blue a small school breaks off high and begins to spawn. Nikon D800, Nauticam housing, 10.5mm lens, ambient light, f8.0, 1/125, ISO640

As a function of light and tide start to collide so do the bumpheads. Each green fish now starts displaying sexual dimorphism (colour changes). Bands and bars start appearing on the bodies and all heads are now white, the show is about to unfold.

The huge school spills into the blue water and the fish begin schooling deeper and swimming at a faster rate. The mating dance begins, males and females swim backwards and forwards in some kind of untimely dance, white heads bobbing

around in the deeper bluish water.

You wait patiently for the first female to make her move, once this happens the whole school will rise and a mass spawn will happen in front of your eyes.

Spawning for only a few intense minutes at first the school darts back into the deep and the mating dance continues, the females seeming to want to make the males work a little harder.

Again another female breaks off from the huge school and rises closer



A Bullshark (Carcharhinus leucas) swims through the Twin Spot Snappers (Lutjanus bohar) school looking to target a weak or injured fish as they are preparing to spawn. Nikon D800, Nauticam housing, 16mm lens, f8.0, 1/125, ISO500

to the surface, with eager males close behind. Again and again spawning rushes are happening all around you.

This firework precision can last as long as thirty minutes or more in which time the school and spawning will slowly start to decrease as the tired bump heads begin to leave the site. A thousand soon dwindles down to less than a hundred and the vibing site soon returns back to its original feeling as all the bumpheads leave ready to return next month.

I feel privileged to be able to work and study these aggregations in

a place like Palau. A country that has protected its very heritage and fish aggregations early on in tradition and culture, realizing their vulnerability and high importance to their oceans.

Spawning aggregations are vital for our fisheries and our oceans survival, the more we can learn about them the more we can help protect them.

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Upcoming Trip that Sam's Tour will collaborate with Nauticam

Package 1:

17-29 April 2016 USD3,950

18-21 April: bohar snapper spawning

22-28 April: target spilurus sea bream spawning, manta aggregations, possibility of 1-2 other species

Package 2:

30 April - 7 May 2016 USD2,550 (Bumpheads spawning)

Trip includes:

Hotel is Centrol Hotel with roundtrip airport transfer and complimentary breakfast.

3 tanks/day except 2 tanks for blackwater dive, Jellyfish Lake permit USD100 extra

Unlimited diving at Sam's Macro Wall

Professional guide, tanks, weights, and free Nitrox up to 32% (with proof of certification)

Hotel transfers, lunch and refreshments on tour days, Free Sam's Tours water bottle

Contact email for this trip:

enquiry@nauticam.com