

## = Giant freshwater stingray =

The giant freshwater stingray ( *Himantura polylepis* , also widely known by the junior synonym *H. chaophraya* ) is a species of stingray in the family *Dasyatidae* . It is found in large rivers and estuaries in Indochina and Borneo , though historically it may have been more widely distributed in South and Southeast Asia . One of the largest freshwater fish in the world , this species grows upwards of 1 @. @ 9 m ( 6 @. @ 2 ft ) across and may reach 600 kg ( 1 @, @ 300 lb ) in weight . It has a relatively thin , oval pectoral fin disc that is widest anteriorly , and a sharply pointed snout with a protruding tip . Its tail is thin and whip @-@ like , and lacks fin folds . This species is uniformly grayish brown above and white below ; the underside of the pectoral and pelvic fins bear distinctive wide , dark bands on their posterior margins .

Bottom @-@ dwelling in nature , the giant freshwater stingray inhabits sandy or muddy areas and preys on small fishes and invertebrates . Females give live birth to litters of one to four pups , which are sustained to term by maternally produced histotroph ( " uterine milk " ) . This species faces heavy fishing pressure for meat , recreation , and aquarium display , as well as extensive habitat degradation and fragmentation . These forces have resulted in substantial population declines in at least central Thailand and Cambodia . As a result , the International Union for Conservation of Nature ( IUCN ) has assessed the giant freshwater stingray as Endangered .

## = Taxonomy and phylogeny =

The first scientific description of the giant freshwater stingray was authored by Dutch ichthyologist Pieter Bleeker in an 1852 volume of the journal *Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen* . His account was based on a juvenile specimen 30 cm ( 12 in ) across , collected from Jakarta , Indonesia . Bleeker named the new species *polylepis* , from the Greek *poly* ( " many " ) and *lepis* ( " scales " ) , and assigned it to the genus *Trygon* ( now a synonym of *Dasyatis* ) . However , in subsequent years Bleeker 's description was largely overlooked , and in 1990 the giant freshwater stingray was described again by Supap Monkolprasit and Tyson Roberts in an issue of the *Japanese Journal of Ichthyology* . They gave it the name *Himantura chaophraya* , which came into widespread usage . In 2008 , Peter Last and B. Mabel Manjaji @-@ Matsumoto confirmed that *T. polylepis* and *H. chaophraya* refer to the same species , and since Bleeker 's name was published earlier , the scientific name of the giant freshwater stingray became *Himantura polylepis* . This species may also be called the giant freshwater whipray , giant stingray , or freshwater whipray .

There is a complex of similar freshwater and estuarine *Himantura* in South Asia , Southeast Asia , and Australasia that are or were tentatively identified with *H. polylepis* . The Australian freshwater *Himantura* were described as a separate species , *H. dalyensis* , in 2008 . The freshwater *Himantura* in New Guinea are probably *H. dalyensis* rather than *H. polylepis* , though confirmation awaits further study . *Trygon fluviatilis* from India , as described by Nelson Annandale in 1909 , closely resembles and may be conspecific with *H. polylepis* . On the other hand , comparison of freshwater whipray DNA and amino acid sequences between India and Thailand has revealed significant differences . Finally , additional research is needed to assess the degree of divergence amongst populations of *H. polylepis* inhabiting various drainage basins across its distribution , so as to determine whether further taxonomic differentiation is warranted .

In terms of the broader evolutionary relationships between the giant freshwater whipray and the rest of the family *Dasyatidae* , a 2012 phylogenetic analysis based on mitochondrial DNA reported that it was most closely related to the porcupine ray ( *Urogymnus asperrimus* ) , and that they in turn formed a clade with the mangrove whipray ( *H. granulata* ) and the tubemouth whipray ( *H. lobistoma* ) . This finding adds to a growing consensus that the genus *Himantura* is paraphyletic .

## = Description =

The giant freshwater stingray has a thin , oval pectoral fin disc slightly longer than wide and

broadest towards the front . The elongated snout has a wide base and a sharply pointed tip that projects beyond the disc . The eyes are minute and widely spaced ; behind them are large spiracles . Between the nostrils is a short curtain of skin with a finely fringed posterior margin . The small mouth forms a gentle arch and contains four to seven papillae ( two to four large at the center and one to four small to the sides ) on the floor . The small and rounded teeth are arranged into pavement @-@ like bands . There are five pairs of gill slits on the ventral side of the disc . The pelvic fins are small and thin ; mature males have relatively large claspers .

The thin , cylindrical tail measures 1 @. @ 8 ? 2 @. @ 5 times as long as the disc and lacks fin folds . A single serrated stinging spine is positioned on the upper surface of the tail near the base . At up to 38 cm ( 15 in ) long , the spine is the largest of any stingray species . There is band of heart @-@ shaped tubercles on the upper surface of the disc extending from before the eyes to the base of the sting ; there is also a midline row of four to six enlarged tubercles at the center of the disc . The remainder of the disc upper surface is covered by tiny granular denticles , and the tail is covered with sharp prickles past the sting . This species is plain grayish brown above , often with a yellowish or pinkish tint towards the fin margins ; in life the skin is coated with a layer of dark brown mucus . The underside is white with broad dark bands , edged with small spots , on the trailing margins of the pectoral and pelvic fins . The tail is black behind the spine . The giant freshwater stingray reaches at least 1 @. @ 9 m ( 6 @. @ 2 ft ) in width and 5 @. @ 0 m ( 16 @. @ 4 ft ) in length , and can likely grow larger . With reports from the Mekong and Chao Phraya Rivers of individuals weighing 500 ? 600 kg ( 1 @, @ 100 ? 1 @, @ 300 lb ) , it ranks among the largest freshwater fishes in the world .

#### = = Distribution and habitat = =

The giant freshwater stingray is known to inhabit several large rivers and associated estuaries in Indochina and Borneo . In Indochina , it occurs in the Mekong River to potentially as far upstream as Chiang Khong in Thailand , as well as in the Chao Phraya , Nan , Mae Klong , Bang Pakong , Prachin Buri and Tapi Rivers . In Borneo , this species is found in the Mahakam River in Kalimantan and the Kinabatangan and Buket Rivers in Sabah ; it is reportedly common in the Kinabatangan River but infrequently caught . Though it has been reported from Sarawak as well , surveys within the past 25 years have not found it there . Elsewhere in the region , recent river surveys in Java have not recorded its presence , despite the island being the locality of the species holotype . Historical records from Myanmar , the Ganges River in India , and the Bay of Bengal ( the latter two as *Trygon fluviatilis* ) have similarly not been corroborated by any recent accounts .

Disjunct populations of the giant freshwater stingray in separate river drainages are probably isolated from one another ; though the species occurs in brackish environments , there is no evidence that it crosses marine waters . This is a bottom @-@ dwelling species that favors a sandy or muddy habitat . Unexpectedly , it can sometimes be found near heavily populated urban areas .

#### = = Biology and ecology = =

The diet of the giant freshwater stingray consists of small fishes and invertebrates such as crustaceans and molluscs , which it can detect using its electroreceptive ampullae of Lorenzini . Individuals can often be seen at the edge of the river , possibly feeding on earthworms . Parasites documented from this species include the tapeworms *Acanthobothrium asnihae* , *A. etini* , *A. masnihae* , *A. saliki* , *A. zainali* , *Rhinebothrium abaiensis* , *R. kinabatanganensis* , and *R. megacanthophallus* . The giant freshwater stingray is viviparous , with the developing embryos nourished initially by yolk and later by histotroph ( " uterine milk " ) provided by the mother . This species does not appear to be diadromous ( migrating between fresh and salt water to complete its life cycle ) . Observed litter sizes range from one to four pups ; newborns measure around 30 cm ( 12 in ) across . Pregnant females are frequently found in estuaries , which may serve as nursery areas . Males mature sexually at approximately 1 @. @ 1 m ( 3 @. @ 6 ft ) across ; female maturation size and other life history details are unknown .

= = Human interactions = =

The giant freshwater stingray is not aggressive , but it merits caution as its sting is sheathed in toxic mucus and is capable of piercing bone . Across its range , this species is caught incidentally by artisanal fishers using longlines , and to a lesser extent gillnets and fish traps . It is reputedly difficult and time consuming to catch ; a hooked ray may bury itself under large quantities of mud , becoming almost impossible to lift , or drag boats over substantial distances or underwater . The meat and perhaps the cartilage are used ; large specimens are cut into kilogram pieces for sale . Adults that are not used for food are often killed or maimed by fishers regardless . In the Mae Klong and Bang Pakong Rivers , the giant freshwater stingray is also increasingly targeted by sport fishers and for display in public aquariums . These trends pose conservation concerns ; the former because catch and release is not universally practiced and the post release survival rate is unknown , the latter because this species does not survive well in captivity .

The major threats to the giant freshwater stingray are overfishing and habitat degradation resulting from deforestation , land development , and damming . The construction of dams also fragments the population , reducing genetic diversity and increasing the susceptibility of the resulting subpopulations to extinction . Due to its low reproductive rate , the giant freshwater stingray is not resilient to anthropogenic pressures . In central Thailand and Cambodia , the population is estimated to have been reduced by 30 ? 50 % over the past 20 ? 30 years , with declines as severe as 95 % in some locations . The size of rays caught has decreased significantly as well ; for example , in Cambodia the average weight of a landed ray has dropped from 23 @. @ 2 kg ( 51 lb ) in 1980 to 6 @. @ 9 kg ( 15 lb ) in 2006 . The status of populations in other areas , such as Borneo , is largely unknown . As a result of documented declines , the International Union for Conservation of Nature ( IUCN ) has assessed this species as Endangered overall , and as Critically Endangered in Thailand . In the 1990s , the Thai government initiated a captive breeding program at Chai Nat to bolster the population of this and other freshwater stingray species until the issue of habitat degradation can be remedied . However , by 1996 the program had been put on hold .