Taxonomic Structures and Glossary of Terms Referenced in Georgia's Protected Fishes Accounts

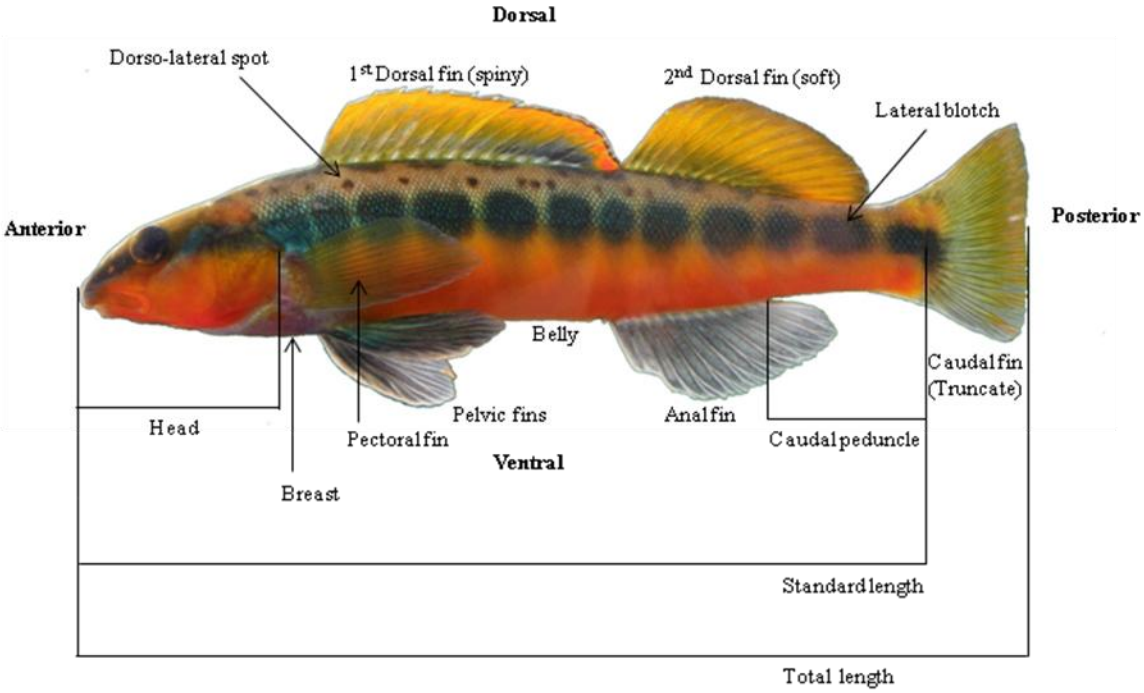

Figure 1. Important taxonomic characteristics labeled on a nuptial male tangerine darter (*Percina aurantiaca,* Percidae), an advanced (i.e., evolutionarily derived) bony fish. Two dorsal fins (vs. one), and forward placed pelvic fins (vs. pelvic fins on belly) are characteristics shared with other evolutionary advanced fishes (e.g, Sunfishes, Centrarchidae). Photo by Brett Albanese, Georgia Department of Natural Resources.

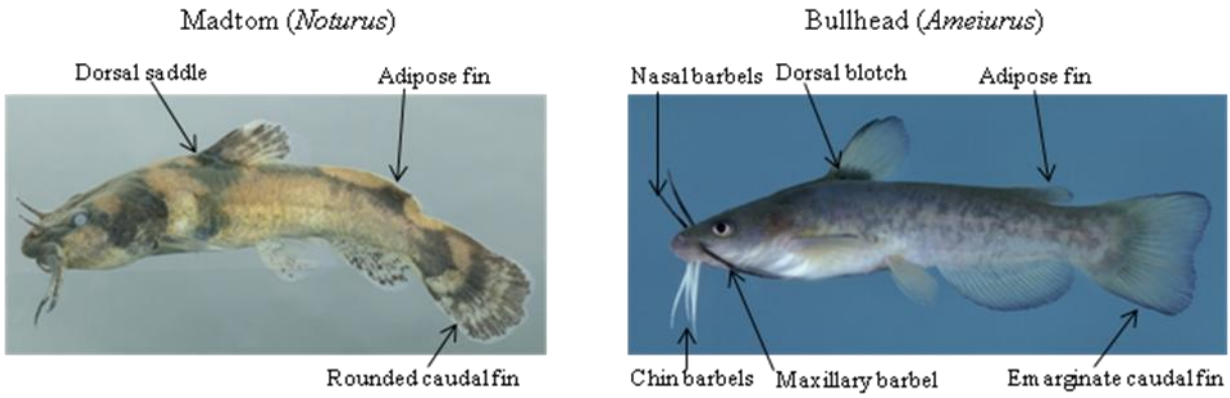

Figure 2. Important characteristics on frecklebelly madtom (*Noturus munitus*) and flat bullhead (*Ameiurus platycephalus*), catfish family (Ictaluridae). The rear margin of the adipose fin is attached to the body on the madtom, but free from the body on the bullhead; a useful character for quickly separating these two genera. Also note the single dorsal fin and abdominal placement of the pelvic fins, characteristics shared with other primitive (i.e., evolutionary basal) groups (e.g., minnows, Cyprinidae). Photos courtesy of Bud Freeman (madtom) and Noel Burkhead (bullhead).

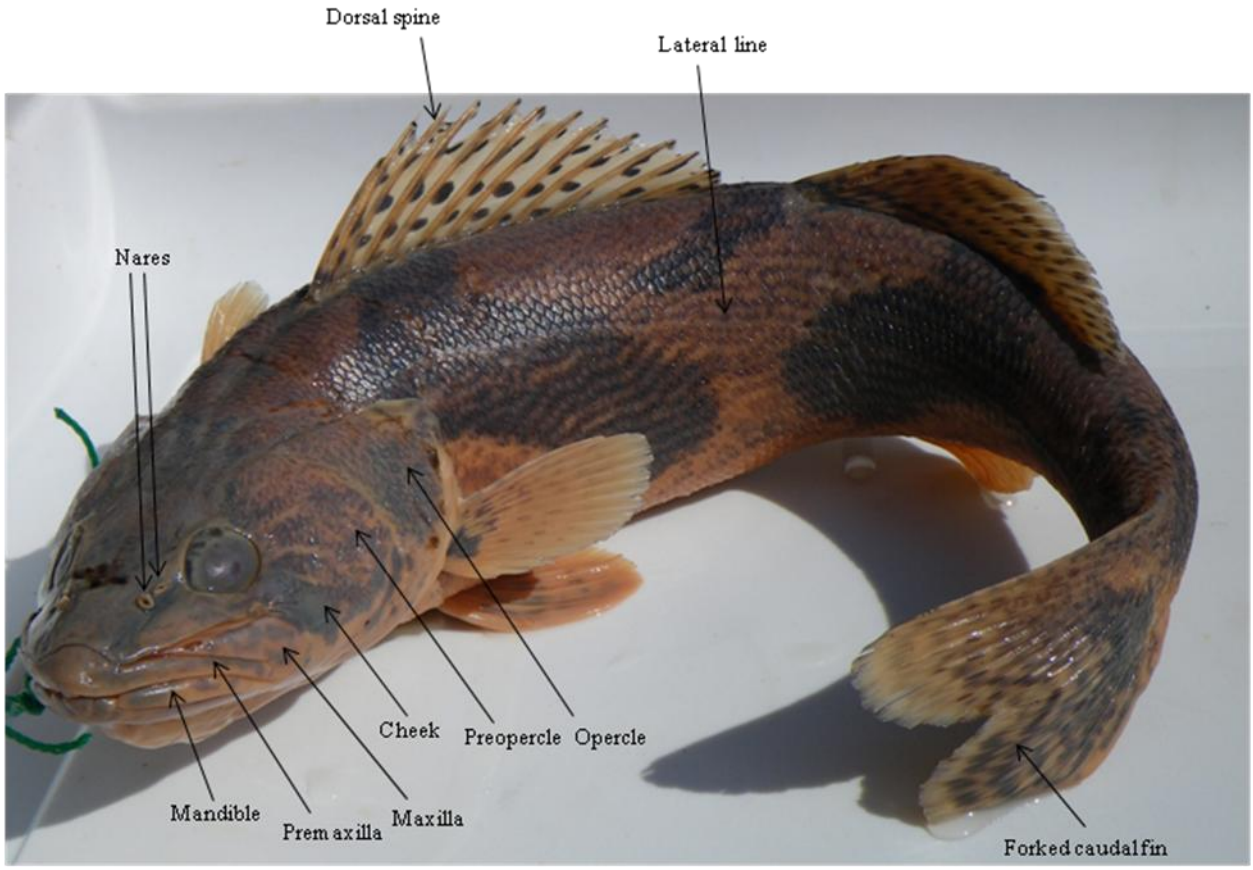

Figure 3. Important taxonomic characteristics on a sauger (*Sander canadense*, Percidae). Photo by Deb Weiler, Georgia Department of Natural Resources.

Figure 4. Head tuberculation patterns on nuptial male minnows in the genus *Cyprinella*. Tubercles are scattered on the Ocmulgee shiner (*Cyprinella callisema*; left) and arranged in linear rows on the bannerfin shiner (*Cyprinella leedsi*; right). Tubercles may also occur on the head, fins, and body scales of other fishes. Photos by Brett Albanese, Georgia Department of Natural Resources.

Glossary of Terms

Adipose fin. n. A small, fleshy fin (lacking rays) occurring on the dorsum between the dorsal and caudal fins in some fishes (e.g., catfishes and trouts).

Algae. n. Mostly aquatic, photosynthetic organisms that are usually small and unicellular.

Allopatric. adj. When two species have non-overlapping ranges.

Ammocoetes. n. Extended larval stage of lamprey that burrows in sediments and filter-feeds.

Amphidromous. adj. Migratory pattern involving movement between fresh and saltwater ecosystems for purposes other than reproduction (e.g., shortnose sturgeon). See anadromous, catadromous, and potamodromous for comparison.

Anadromous. adj. Describes organisms that migrate up freshwater rivers from the sea in order to breed (e.g., Atlantic sturgeon). See amphidromous, catadromous, and potamodromous for comparison.

Bar. n. A vertical marking or band on the body.

Barbels. n. Slender, fleshy whisker-like organs found on the heads of some fishes which help them sense environmental conditions.

Benthic. adj. Living on or close to the bottom of a body of water.

Bivalve. n. A type of mollusk with two hinged shells, such as a mussel or clam.

Branchiostegal membrane. n. Membranes and supporting fin rays that are attached to the ventral side of each gill cover; also known as the gill membranes. The two membranes may be broadly, moderately, or narrowly connected to each other across the ventral surface of the head; or they may be completely separate.

Breast. n. Ventral surface between the gill membranes and the base of the pectoral fins (or pelvic fins when these are placed anteriorly)

Catadromous. adj. A fish that migrates down freshwater rivers to breed in the ocean (e.g. American eel). See anadromous, amphidromous, and potamodromous for comparison.

Caudal peduncle. n. The part of the body between the caudal fin base and the posterior insertion of the anal fin.

Chromatophores. n. Cells bearing pigment that give color to surrounding tissue.

Clutch. n. A group of eggs laid in a single breeding attempt.

Crepuscular. adj. Active during dawn or dusk periods.

Crustaceans. n. Mostly aquatic species that have rigid shell-like coverings on their bodies. Examples of crustaceans include shrimp, crabs and amphipods.

Detritus. n. Fragments of organic material.

Dimorphic. adj. Having two different forms or body types within a population, that are often associated with sex (i.e., sexual dimorphism).

Diurnal. adj. Active during the daytime.

Dorsal. adj. Relating to the back.

Dorso-ventrally compressed. adj. Flattened along a horizontal plan (e.g., a sculpin). See laterally compressed.

Dorsum. n. Upper surface of the body.

Emarginate. adj. Having a slightly indented (but not forked) edge, as in an emarginated tail. See truncate.

Endemic. adj. When a species naturally occurs only within a certain region or drainage.

Estuary. n. Enclosed or partially enclosed coastal water body with salinity that is diluted by freshwater from rivers and runoff.

Eutrophic. adj. A water body with high rates of biological growth or productivity. Eutrophication occurs when water bodies become more productive because of increased nutrient inputs. Cultural eutrophication occurs when the source of elevated nutrients is associated with human activity.

Evolutionary Significant Unit (ESU). n. Population or group of populations exhibiting variation in genetics, morphology, and behavior that is considered important to the evolutionary legacy of the species. Conserving all ESUs of a species ensures the protection of the full range of genetic biodiversity and unique forms that may be in the process of speciation.

Extirpate. v. To eliminate a population from a given area.

Falcate. adj. A concave fin margin, with the anterior rays longer than the posterior rays (e.g., dorsal fin of a sicklefin redhorse)

Fecundity. n. The reproductive output within a year, usually measured as the number of eggs produced.

Flashy (stream). adj. Describing a stream that rises and falls very quickly in response to rainfall.

Frenum. n. fleshy bridge of tissue connecting the upper jaw to the snout; the presence or absence of a frenum is an important taxonomic characteristic in darters (Percidae).

Fry. n. General term for a small fish that has absorbed its yolk-sac and can feed on its own.

Gametes. n. Reproductive cells (sperm or eggs).

Gape. v. To open the mouth widely. n. the mouth opening, measured as the straight-line distance between the corners of the mouth.

Gill arch. n. Set of bones supporting the gills.

Gill filaments. n. Thread-like structures that extend posteriorly from the gill arches and are used for respiration.

Gill rakers. n. Anterior projections on the gill arches that may be used to protect the gills and strain out food particles. The number and shape of gill rakers are important taxonomic characters.

Glochidia. n. The larvae of freshwater mussels, some of which attach themselves to the gills or fins of a host fish until the young clams are large enough to survive on their own.

Gravid. adj. Females containing mature eggs or embryos (in livebearing fishes) and are ready to spawn or give birth.

Gular. adj. Pertaining to the throat. (e.g., the gular plate on a bowfin).

Impoundment. n. The waterbody created by a dam; a reservoir.

Inferior (mouth). adj. Describes mouth positioned on underside of the head. See subterminal (mouth), terminal (mouth), and superior (mouth).

Interstices. n. Small spaces between objects.

Invertebrate. n. An animal that does not have a backbone. Insects, snails and worms are examples of invertebrates.

Larva. n. (larvae pl, larval adj.). Stage between hatching and juvenile stage when all fin rays have not completed development.

Lateral line. n. Pored scales running along the side of the body between the operculum (i.e., gill cover) and the base of the caudal fin that detect vibrations in the surrounding aquatic environment. If the pored scales do not extend all the way to the base of the caudal fin, the lateral line is incomplete (vs. complete). The lateral line may also be completely absent in some species or life stages.

Laterally compressed. adj. Flattened on a vertical plane (e.g., a shad or a sunfish). See dorso-ventrally compressed.

Mandible. n. The lower jaw bone or dentary bone.

Marine. adj. Having to do with the sea, including salt water gulfs and oceans.

Maxilla. n. Posterior-lateral bone in the upper jaw

Medial. adj. Toward the middle.

Melanophore. n. A color cell with melanin, a dark pigment which can produce shades ranging from gray to black.

Migrate. v. The periodic movement of animals from one region of land or water to another. See amphidromous, anadromous, catadromous, and potamodromous.

Mollusk. n. An animal that has a shell and a muscular organ, sometimes called a foot, used to move the animal around or attach it to something else. Examples include clams, oysters, mussels and snails.

Mottled. adj. A color pattern dominated by irregular markings or blotches.

Nocturnal. adj. Active during night hours.

Nuptial. adj. Describing animals in a reproductive condition, which could include specific color patterns, morphology, and behavior related to mating.

Oblique. adj. angled or slanted, usually in reference to the shape of the mouth and contrasting with a straight or horizontal mouth profile.

Operculum (Opercle). n. Flexible bone covering the gills of fishes, also known as a gill cover.

Papillose. adj. Divided into rounded, fleshy protuberances (i.e., papillae), usually referring to sucker lips.

Pelagic. adj. Of, pertaining to, or living in open oceans or seas rather than waters adjacent to land or inland waters.

Pharyngeal teeth. n. The teeth found on the posterior-most gill arch in some fishes, such as minnows and suckers. The shape and number of teeth are useful taxonomic characteristics, but examining them usually requires dissection.

Plankton. n. Tiny aquatic organisms that drift in the water column and are an important food source for higher trophic levels. Phytoplankton are photosynthetic whereas zooplankton must obtain their food from other sources.

Plicate. adj. Divided into parallel ridges (i.e., plicae), usually referring to sucker lips.

Premaxilla. n. The most anterior bone in upper jaw.

Potamodromous. adj. Migration that occurs within freshwater (e.g., freshwater drum). See anadromous, catadromous, and amphidromous for comparison

Predator. n. An animal that preys upon other animals for food.

Ray. n. A soft, segmented and usually branching bone used to support fin membranes. Observing segmentation and branching may require magnification. See spine.

Riffles. n. Areas of shallow, turbulent water in streams and rivers.

River basin. n. A group of interconnected drainages entering a common river, estuary, or ocean.

River drainage. n. A group of interconnected streams that form part of a basin or whose main channel enters an estuary or ocean.

River system. n. A group of interconnected streams within a river drainage.

Saddle. n. A pigmented area on the dorsum of some fishes. It may extend onto the sides.

Scute. n. A large, hardened scale or plate (e.g., scutes on a sturgeon)

Serrae. n. Small, pointed, tooth-like projections. Serrate adj.

Sexual dimorphism. n. The state of having distinct differences in color, size, or physical structure between males and females of the same species.

Siltation. n. The deposition of fine sediments (silt) into a waterbody. Siltation can damage fish gills, decrease productivity of insect populations, and fill in spawning and refuge habitats for aquatic species.

Snout. n. Dorsal surface of head between the eye and the anterior end of the upper jaw.

Spawn. v. The reproductive process that involves the laying and fertilization of fish eggs.

Species. n. A category of organisms possessing a lineage independent of other lineages, capable of evolving independently and reproducing. Species are diagnosed by differences in color patterns, behavior, morphology, and genetics.

Spine. n. An un-segmented and un-branched bone that supports fin membranes in some fishes, usually sharp and stiff.

Standard length. n. Length measured from the tip of the snout to the end of the caudal fin base. For precise measurements, bend the tail upwards to form a crease marking the end of the caudal fin base.

Stripe. n. a band or marking running lengthwise along the body. See bar.

Substrate. n. Materials that compose the stream bottom.

Subterminal (mouth). adj. When the anterior end of the mouth is located just below the tip of the snout; mouth usually opens downward. See inferior (mouth), terminal (mouth), and superior (mouth).

Superior (mouth). adj. When the anterior end of the mouth opens distinctly above the tip of the snout; mouth opens upward. See inferior (mouth), subterminal (mouth), and terminal (mouth).

Sympatric. adj. When two species have overlapping ranges, they are considered sympatric. They may or may not actually occur together in the same habitats (i.e., syntopic).

Syntopic. adj. When two species occur in the same habitats.

Terminal (mouth). adj. When the anterior end of the mouth is even with the tip of the snout; mouth opens in a forward direction. See inferior (mouth), subterminal (mouth), and superior (mouth).

Tributaries. n. Streams or rivers that flow into larger streams or rivers.

Troglobite. n. An animal adapted to life within a cave or other underground structure.

Trotline. n. A line set with baited hooks and unattended for a certain period of time.

Truncate. adj. Having a straight or squared-off edge, as in a truncate tail.

Tubercle. n. A keratinized bump or ridge, usually found on the skin and fins of breeding male fishes.

Type locality. n. A geographic place where specimens were collected for the description of a species.

Undescribed species. n. A species with physical behavioral, reproductive, and other characteristics that have not been formally described by scientists.

Ventral. adj. Relating to the belly, or underside.

Watershed/basin. n. The geographic area drained by a river and its tributaries. The waters in the area eventually drain into the main river.

Definitions adapted from the following sources:

Boschung, H.T. and R.M. Mayden. 2004. Fishes of Alabama. Smithsonian Institution, Washington D.C. 736pp.

Jenkins, R.E. and N. M. Burkhead. 1993. Freshwater fishes of Virginia. American Fisheries Society, Bethesda, MD.

Menhinick, E.F. 1991. The freshwater fishes of North Carolina. North Carolina Wildlife Resources Commission, Raleigh, NC.

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