

RUDD MENACE

by Bruce Gebhardt, Philadelphia, Pennsylvania

The Rudd (Scardinus erythrophthalmus) is a European and West Asian minnow. Specimens under 3" closely resemble North America's Golden Shiner (Notemigonus crysoleucas); the two species are close relatives and can interbreed.

The Rudd has been introduced worldwide--U.S. included--as pond ornament and bait. The Golden Shiner likewise inhabits a far broader range than it did originally, because it is the most popular baitfish. Its resultant proliferation speaks ominously for the colonizing potential of the Rudd, which could become even more popular than the Golden Shiner.

Primarily freshwater, the Rudd can also handle brackish. Temperature tolerance is likewise very broad. It prefers quiet water of vegetated lakes and ponds--just what the Golden Shiner likes. While Rudd have been established in a few scattered U.S. locations for many years, the bait industry has recently been pushing them aggressively. Rudd have colonized many U.S. waters, and some ichthyologists, including those at the National Fisheries Research Center in Gainesville, Florida--the U.S. Fish & Wildlife Service lab that studies introduced fishes--are quite concerned.

Proscribed by Many States

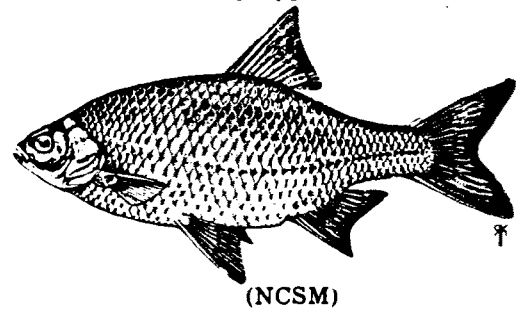
According to an NFRFC document co-authored a few years ago by Dawn Jennings, NANFA member James D. Williams, and Noel M. Birkhead, bait-dealers in the following states sold Rudd, or had done so: AL, AR, GA, IL, KS, ME, MA, MO, NY, NC, OK, SC, TN, TX, VA, and WI. Two NANFA members found it sold in southern New Jersey in the summer of 1990 (details below).

It has been introduced purposely, apparently, in Prairie Cy., AR; Cook, Lake, DeKalb, Kankakee, Kendall, and La Salle Cys., IL; Kennebec Cy., ME; (all locations following are counties) Ralls, Monroe, Shelby, and Audrain, MO; Columbia, NY; Bryan, OK; Cooke & Grayson, TX; Fairfax, VA; Fond du Lac, WI.

The outline states: "At the present time, a majority of states in the U.S. consider (R)udd as a 'generally restricted or prohibited species based on existing exotic fish regulations.'" That probably means general prohibitions against introducing fish to state waters without permission. At least five states specifically prohibited rearing and sale (AL, CT, LA, MI, VA) of Rudd and eight states were considering it (CA, KS, NE, NY, NC, SC, TX, WI). Florida apparently has done so since then.

Order Cypriniformes
Family Cyprinidae

Adult Rudd has rotund shape; young ones slimmer, similar to Golden Shiners. Sketch from Atlas.



South Jersey Discovery

In June, 1990, Arkansas member David Arbour and I were collecting fish in Cumberland County, southern New Jersey. A small boy with a bucket came over and inquired as to our idiocy. The contents of his bucket seized our attention--minnows about 3" long with vivid red-orange fins. We quickly made a deal, offering some of our catch and some of our cash in exchange for his fish.

One possibility was that we had Golden Shiners specially developed with colorful fins by the bait industry. There were some differences besides the fins, though. First, the eye seemed larger or more goggly--maybe just more prominently placed or outlined--than that of Golden. Second, the scales seemed a little more convex, less streamlined than those on the Golden. The Rudd possibility occurred to me early because I had read the NFRC report, but I wavered because they looked so much like Golden.

A letter to Jim Williams enclosing a slide brought quick response. Dawn Jennings was pretty sure our fish was a Rudd. She sent additional material that confirmed it.

State's Rights

Ms. Jennings asked if I'd preserve the fish and send it down. No, I said, but I'd ship the live fish. She said that might violate Florida law against shipping live Rudd. So here was the nation's first line of defense against exotic fishes, and this state law prevented their reception of an important specimen! (There had been old reports of their appearance in NJ, but not recent ones.)

Further Differences

There are Rudd-Golden differences besides those David and I noticed. Golden Shiners may develop colorful fins, but usually only in breeding males far larger (though some Florida specimens are reddish-finned at a small size). As Rudd grow (to about 16"), the body deepens considerably. The sketch in the Atlas of North American Freshwater Fishes shows an adult

fish rotund in profile. Big Golden, which can reach nearly the same size, may deepen in profile, and ripe females can be very heavy-bellied, but they are never as round as the sketched Rudd. The accompanying tables distinguish the species from each other in more detail.

The Rudd is somewhat vegetarian. It would be awful if they ate their way through the habitats of plant-dependent native fishes--for example, the three Enneacanthus sunfish and most other species in the New Jersey Pinelands, where David Arbour and I first saw Rudd. Fortunately, they appear to snack only casually on plants for fast food, and are unlikely to overgraze--if their numbers stay moderate.

As to the tables, I don't remember what the formulas mean either, but most ichthyological tracts that condescend to the unwashed explain them. Regardless, there's enough intelligible information to make these charts useful. Dissection is unnecessary. Note that the charts differ on some points. In specimens I saw, the "red" in the eye manifested itself early as the color of a watermelon-flavored hard candy, but it was no longer visible after seven months in an aquarium.

Sex differences among Rudd seem fairly clear to me: males are trimmer than females and have brighter fins.

Unlikely Purists

The Texas document is an 8½x11 piece of slick stock featuring three color photos comparing species--a useful item to slip inside your Atlas. Try to persuade the Heart of the Hills research station to send you a copy. Texas Parks & Wildlife, of which that station is a part, employs those wonderful folks who wanted to introduce Nile Perch and (South American) Peacock Bass and reportedly did. It's hard to imagine they care much about exotics. Maybe Heart of the Hills is an isolated outpost of rebellion.

What to do if you catch some "red-finned Golden Shiners," which probably are Rudd? Well, you might notify James D. Williams, National Fisheries Research Center, 7920 N.W. 71st St., Gainesville, FL 32606 (904-378-8181). (Ms. Jennings has transferred to the fisheries research lab in Ft. Collins, Co.) Other than that, you might notify your state fish agency. They probably don't want to know, but they might. On the other hand, they might arrest you if it's illegal to have Rudd there and you are keeping some. Above all, however, notify AMERICAN CURRENTS. We may be able to trace the course of the invasion.

Rudd are fine aquarium fish. In fact, I could swear I saw some labeled "Red-finned Tinfoil Barbs" in an aquarium store. Some Rudd have a red in their tail and fins that's out of this world. Most don't; they fade a bit over time,
--Text cont'd after tables

TABLE I. DIAGNOSTIC CHARACTERS OF RUDD AND GOLDEN SHINER

Character	RUDD	GOLDEN SHINER
PHARYNGEAL TEETH	3,5-5,3	0,5-5,0
TOOTH MORPHOLOGY	Crown hooked, crenate	Crown hooked, smooth
FIN PIGMENTATION	Median fins orange-red in specimens >38mmTL	Caudal fin orange red only in large nuptial males
MIDVENTRAL KEEL	Scales present	Naked
GILL RAKERS	10-13	17-19
LATERAL LINE SCALES	LL 38-41	LL 44-54
DORSAL FIN RAYS	DF 9-11	DF 7-9

Source: Adapted from Dawn P. Jennings, James D. Williams, Noel M. Burkhead, Current Status of Rudd, *Scardinius erythrophthalmus*, in the United States, National Fisheries Research Center, 7920 N.W. 71st St., Gainesville, FL 32606, 904-378-8181.

TABLE II. RUDD AND GOLDEN SHINER IDENTIFICATION GUIDE

Character	Rudd	Golden Shiner
DORSAL RAYS	iii, 8-9 (10)	i-ii, 7-9
ANAL RAYS	iii, (9) 10-11 (12)	i-ii, 8-19
LATERAL LINE SCALES	37-45	39-57
GILL RAKERS	9-10--short, stout	17-19--long, slender
PHARYNGEAL TEETH	3,5-5,3 or 2,5-5-2	0,5-5,0 or 0,4-4,0
VENTRAL KEEL	Scaled	Unscaled
EYES	Red or with red spot	Yellow-green
FINS	Bright red	Yellow-Green (except in large spawning adults)

Source: Adapted from Texas Parks & Wildlife Department, Rudd and Golden Shiner Identification Guide, Heart of the Hills Research Station, Ingram, TX 78025 (512-866-3356), 1990.

and may not show their best if they don't like the lighting or other conditions. At their best, the red will contrast beautifully with the dark-silver back and silver sides. At worst, their body color may be straw, but they'll still look good. It may be possible to find ways of preserving or enhancing their color. Dawn Jennings says that they like dark water. Lots of Vitamin A, bloodworms (Chironomus larvae) or some aquarium color food may be helpful.

Rudd would probably breed in an adequately sized aquarium. Dawn Jennings reports that they have not bred in tanks smaller than 125-gallon, but there has been no attempt to have them do so. It doesn't seem unreasonable that a much smaller tank would suffice.

Besides color and likely promiscuity, the prime aquarium virtue of Rudd is extreme hardiness. Golden Shiners are fairly durable, but Ms. Jennings calls them "wimps" compared to Rudd. Rudd are next to immortal--eat anything, don't get sick, thrive despite abuse. A laundry-detergent spill onto my charcoal supply instantly wiped out many fish in one of my tanks--darters, a sucker, two carp--but the Rudd held out.

So What's Wrong with Them?

Despite the hue and cry, no one has yet demonstrated how Rudd are going to hurt North American aqua-ecology. While Rudd established themselves on this continent earlier in the century, they did not overrun the new host regions.

The main argument against them so far--sufficient, in my opinion--is that they are not native to North America. Beyond that, it appears that the species most at risk immediately is the Golden Shiner, by interbreeding more than by direct competition. This is ironic, since the Golden isn't native in most of its present range. Arguably, the Golden's elimination in many areas would be a restorative tonic, though most populations have settled down as good naturalized citizens.

Order Cypriniformes
Family Cyprinidae

Golden Shiners have slimmer profile.
Sketch from Atlas.

