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**Red Drum Tag Return Data Overview
Virginia Game Fish Tagging Program
1995-2000***

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&
VIMS Sea Grant Marine Advisory Program**

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Red Drum Tag Return Data Overview
Virginia Game Fish Tagging Program: 1995-2000

Jon Lucy, VIMS Sea Grant Marine Advisory Program
Virginia Marine Resource Report Number 2001-15

Introduction and Background

The Virginia Game Fish Tagging Program (VGFTP) trained its first taggers during the winter of 1995. Red drum has been one of 6-8 species targeted by the program since its inception.

Angler taggers must register for the program and complete tagging training by attending workshops held annually in various coastal communities. To better manage the program, participants are limited in number (began at about 90 in 1995, slowly increasing to 160 anglers in 2001).

Small nylon, single-barb dart tags were initially used in the program (1995-97). However, tag retention trials during 1997 with tautog, gray trout, and speckled trout documented that for the first two species, T-Bar tags implanted with a tagging gun (using a one inch, small diameter slotted needle) consistently produced higher retention rates than the dart tags (fish generally held in large, flow-through tanks for 1-4 weeks). Therefore, in 1998 the program switched to using T-Bar tags (with 1.75 in./44 mm sheaths) for most targeted fish, especially given that the majority of tagged and released fish were just under the species' legal size. Anglers still had the option to use dart tags when releasing larger cobia, red drum and black drum.

1995-96 Effort and Results

Red drum tagging efforts began slowly with less than 200 fish tagged and released by the end of 1996. Only six recaptures of red drum were reported during 1995-96 from the release of 158 tagged fish (a recapture reporting rate of 3.8 % from 66 fish tagged in 1995 and another 92 in 1996). A fish tagged on 9/16/95 at Gwynn's Island was recaptured off Norfolk's Ocean View area only eight days after release (9/24/95), indicating how rapidly such fish move down the Bay as water temperatures begin cooling in the fall. However, more notably was a double recapture of a puppy drum (16.5 inch total length [TL]) tagged and released 10/1/95 at the Monitor Merrimac Bridge-Tunnel (lower James River-Hampton Roads area). Recaptured in the surf near Oregon Inlet, NC on 11/20/95 (50 days at large [DAL]), the fish was re-released with its tag in place. The fish was recaptured a second time in the vicinity of Little River Inlet, SC, having been found by a commercial fish dealer in a catch of fish caught in that area on 1/4/96 (an additional 45 DAL for a total of 95 DAL). While it is well known by recreational and commercial fishermen, and fishery managers, that small and large red drum move out of Chesapeake Bay in the fall, this set of two recapture events provided the first solid documentation of the rate and extent of movement of smaller fish from the Bay south along the Carolina beaches.

1997 and “Hot Ditch” Tagging Issue

In 1997 a significant increase in abundance of 14-17 inch (TL) puppy drum occurred in Chesapeake Bay. With tagging effort primarily focused in the Elizabeth River’s “Hot Ditch” (cooling water discharge area from a steam-electric power station in the river’s Southern Branch), along with some effort also in Rudee and Lynnhaven Inlets, 44 red drum recaptures occurred during 1997 (an increase in the cumulative reporting rate to 8.4 %).

The Hot Ditch is neither a typical habitat nor thermal environment for red drum in Virginia’s Chesapeake Bay waters. Therefore, the summary primarily focuses on drum tagged in waters inside Virginia Beach’s oceanfront Rudee Inlet. Limited recapture data are also addressed for puppy drum tagged and released inside Lynnhaven Inlet, as well as a few areas further north along the Bay’s western shore.

1997-2000: Increased Tagging Effort and Recapture Trends

Tagging effort in Rudee Inlet increased steadily from 1997-2000 as numbers of “puppy drum” (14-20 inches) increased in abundance through the period. Numbers (rounded off) of fish tagged inside Rudee were: 50 (1997), 140 (1998), 550 (1999), and 780 (2000). In 2001, the abundance of smaller red drum declined significantly in Virginia waters resulting in significantly fewer drum tagged overall (< 250 fish as of October 11).

Several consistent trends have been observed in recapture patterns.

1997

Rudee Inlet

Only five (5) Rudee tagged fish (14-16 inches) were recaptured (10 % return rate). Tagged from early September through late October, three fish were recaptured still inside the inlet only 2-9 days post release. However, two fish left the inlet (tagged October 1 and 21), being recaptured at Oregon Inlet, NC (after only 9 days at large [DAL]) and Cape Point, NC (17 DAL), respectively.

Lynnhaven Inlet

Some tagging of similar size reds inside Lynnhaven Inlet also added documentation to the relatively steady fall movement of drum out of the Bay and along the North Carolina beaches. Three drum (15-17 inches) tagged inside Lynnhaven Inlet from 9/12-29/97 were recaptured in North Carolina during a four day period (10/24-27/97): Oregon Inlet (tagged 9/29--25 DAL), Avon (tagged 9/15--42 DAL), and Cape Lookout (tagged 9/12--43 DAL).

1998

Rudee Inlet

Because of increased abundance of fish and increased tagging efforts of key anglers, movement and site fidelity patterns of small red drum at Rudee were further defined in 1998. Of 18 recaptures of Rudee-tagged fish during the year (about a 13 % reporting rate), three fish (14-16 inches TL) had been tagged in spring (3/28-4/23/98) and the remainder in early to mid fall (9/13-10/27).

Of the spring-tagged fish, one moved into Chesapeake Bay, being recaptured 8/21/98 inside Lynnhaven Inlet (tagged 3/30--135 DAL). A second fish (tagged 3/28) was recaptured on 10/17) inside the inlet (203 DAL). Such data, representing a single recapture, provides no information regarding whether this specific fish moved out of Rudee and then returned in the fall, or simply resided inside the inlet from spring through fall. The third fish (tagged 4/23) was recaptured in the surf at Rodanthe, NC on 11/8/98 (199 DAL), again documenting southward movement of at least some Rudee drum during fall.

Recaptures of 15 fall tagged drum further documented not only southward movement of some fish along North Carolina beaches, but that such movements can occur over very short periods of time. Six of the referenced fish (tagged 9/29-10/27) were recaptured as follows: Kitty Hawk, NC surf (Recap.10/10-1 DAL), Kitty Hawk, NC surf (Recap.10/16-4 DAL), Kitty Hawk, NC surf (Recap.10/14-5 DAL), Oregon Inlet, NC (Recap.10/4-5 DAL), Sandbridge Fishing Pier (Recap.11/8-12 DAL), and Drum Inlet (southern inlet, Portsmouth Island, NC) (Recap.11/13-30 DAL).

In contrast, however, nine puppy drum tagged 9/13-10/26) were recaptured still within the inlet. Days at large were minimal for seven fish, being only 3-11 days, not a surprising result except when compared to the rapid departure during the same period of the fish previously described. Two fish (tagged 10/7 and 10/26; 18 and 16.75 inches, respectively) remained inside the inlet for 33-34 days before being recaptured on 11/9 and 11/29. These data illustrate the mixed pattern of fall residence and movement patterns for small drum in Rudee waters

Lynnhaven Inlet

Tagging of 84 puppy drum inside Lynnhaven produced seven recaptures (8 % reporting rate) of which four (tagged 8/5-9/14) were fish caught again inside the inlet or at the inlet bridge within short times of release (3-22 DAL). In contrast, three fish tagged 9/5-10/8 moved rapidly out of the inlet and the Bay to Outer Banks, NC beaches (recaptured at Duck—7 DAL, Nags Head—12 DAL, and Kitty Hawk—5 DAL). This fall release-recapture pattern was very similar to that also observed with some drum tagged in Rudee Inlet except, (1) late summer-fall residence times inside Lynnhaven were 11-12 days shorter than for some Rudee fish, i.e., two Rudee fish tagged 10/7 and 10/26/98 were recaptured again in Rudee 11/8-9—33 and 34 DAL) and (2) the rapid movement of some puppy drum from Lynnhaven Inlet waters to Outer Banks beaches in 5-12

days obviously occurred over a slightly greater “linear” distance (approximately 10 additional statute miles) than the case for Rudee fish (assuming the fish largely move laterally along the shorelines in question once leaving the respective inlets).

1999

Utilization patterns of Rudee Inlet by small red drum were further confirmed during 1999 when greater numbers of puppy drum were tagged at the site (550 fish versus 140 in 1998). Basic patterns supported by the recapture data were:

- Small red drum (14-20 inches) remain inside Rudee for significant periods from late spring into summer (21-103 days) and from late summer into fall (7-67 days).
- During spring, some drum in this same size range also leave the inlet (primarily during April-May), moving northward and entering areas of the lower Chesapeake Bay; these same fish may stop again in Rudee as they depart the Bay in fall (given Rudee recaptures of some bay-tagged fish), but no multiple recaptures of such drum confirm this possibility to date.
- Rudee appears to serve as a stop-over area for some small drum moving out of the Bay during late summer and fall. Drum tagged in the lower Bay during mid-late summer, as well as during fall, have been recaptured in Rudee Inlet during November (fish tagged 8/18/99 in Lynnhaven Inlet recaptured in Rudee 11/21 (95 DAL); fish tagged 11/22/99 at Norfolk’s Little Creek jetties recaptured in Rudee 11/23/99 [1 DAL]).
- Some small drum tagged during the fall inside Rudee move south to North Carolina beaches, being recaptured on the southern beaches from late September through October and into November.

Rudee Inlet

Tagging efforts in Rudee during 1999 resulted in 90 recaptures (a 16 % reporting rate) of which 59 fish were again caught inside the inlet (within 1-37 days of release). Examples of puppy drum movement patterns from the inlet follow:

- *Spring-tagged Drum Moving into Chesapeake Bay*

For fish (14-20 inches TL) tagged largely during April-May, while the majority (42 fish) were recaptured within the inlet after 1-37 DAL, some fish also moved north to areas in the lower Chesapeake Bay.

- Fish tagged 4/5-27 in Rudee recaptured as follows: at the Chesapeake Bay Bridge Tunnel (CBBT) 1st Island (5/20-27 DAL), Fort Monroe pier (5/16-30 DAL), the Lynnhaven Fishing Pier (5/12-37 DAL), on Plumtree Bar (Poquoson Flats) (6/1-47 DAL), inside Lynnhaven Inlet (5 fish) (6/27-8/22; 65, 72, 110, 112, and 119 DAL), and on Poquoson Flats (8/22-117 DAL).

- Fish tagged 5/5-5/25 in Rudee were recaptured as follows: off Sewells Point (6/6-17 DAL), Lynnhaven Inlet (7/29-65 DAL), and Goodwin Islands-mouth of York River (8/4-87 DAL).
- Three fish tagged in Rudee 4/27-5/23 all were recaptured in the Hot Ditch-S. Branch Elizabeth River from 7/13 to 8/5 (74,77,88 DAL).

- *Late Summer-Fall 1999 Fish Patterns*

Some fish exhibited significant residence times in inlet waters while others moved south along North/South Carolina beaches. Three recaptures of fish tagged during fall 1998 provided indications that some puppy drum leave the inlet in fall, then either return to the inlet the following year or remain in more southern waters such as the North Carolina sounds.

- Some fish (17) were recaptured still inside the inlet, most after 1-36 DAL; however, two fish were caught still in Rudee after 67 DAL (both were tagged 9/14 and recaptured 11/20).
- A few fish also moved out of the inlet southward along the VA-NC beaches, being recaptured at: Nags Head, NC (on 10/7-11 DAL), the Sandbridge surf (10/9-31 DAL), and Ocracoke, NC (9/23-45 DAL).
- A fish (20 inches) tagged 8/22/99 was recaptured off South Carolina (10/29-68 DAL).
- Three fish (14-16 inches) tagged in Rudee in fall 1998 (9/19-11/1/98) were recaptured: two fish again in Rudee (tagged 9/19 and 11/1/98; recaptured 6/9 and 6/16/99-263 and 227 DAL) and one fish in the northern portion of Pamlico Sound, NC (tagged 9/28/98; recaptured 7/1/99-276 DAL).

Lynnhaven Inlet Fish

Of 152 fish tagged in Lynnhaven waters during 1999, 12 were recaptured (8 % reporting rate), all having been tagged from 8/4-10/15 and recaptured from 9/7-11/23; the pattern of recaptures was much like drum tagged during a similar period in Rudee Inlet, i.e., some fish recaptured again in Lynnhaven after only 1-15 DAL and some after 40-50 DAL; others moved out the Bay, even to North Carolina beaches.

- Fish tagged 8/4 through 9/7 were recaptured: four fish (12-22 inches) within the inlet (1, 6, 15, and 40 DAL); one (21 inch) at Rudee Inlet (11/21-95 DAL); one (12 inch) in the Sandbridge surf (10/21-45 DAL); and three fish (16 and 21 inches) in North Carolina at Duck (10/12-14 DAL) and Kitty Hawk (9/23-39 DAL).

- Five fish tagged 9/25-10/15 were recaptured: one (13 inches) inside the inlet (11/14-50 DAL); two (13 and 15 inches) in the Virginia Beach surf (on 10/5-3 DAL and 11/23-52 DAL), and one (17 inch) in Nags Head (11/20-36 DAL).
- A fish (18 inches) tagged in fall 1998 (10/3/98) in Lynnhaven was recaptured during 1999, caught again inside the inlet (at 21 inches) on 8/17/99 (318 DAL).

Other Chesapeake Bay Tagged Fish-1999

Recaptures of a few fish tagged inside Chesapeake Bay primarily demonstrated puppy drum moving down the Bay in late summer to fall. Some fish were recaptured off North Carolina in surprisingly short times.

- *Little Creek Jetties-Norfolk*: five fish (14-16 inches) of 31 tagged were recaptured; all five moved out the Bay; the fish were tagged 9/10-11/22/99 and recaptured from 9/20-11/23: two fish at Nags Head, NC (on 9/20 and 10/26-4 and 10 DAL), and two fish in the Virginia Beach-Sandbrige surf (10/31-9 DAL and 11/22-31 DAL, respectively) and one in Rudee Inlet (11/23-1 DAL).
- *Poquoson Flats*: Of 37 fish tagged on the flats in 1999, three (12-17 inches) tagged from 9/12-10/3 were recaptured: two fish tagged 10/2-3 were recaptured with one (12 inches) still on the flats when caught 10/13 (10 DAL) while the other (17 inch fish) moved to Duck, NC during a similar period (recaptured 10/16-14 DAL); a third recapture occurred at the Monitor-Merrimac Bridge Tunnel (tagged 9/12, recaptured 10/13-31 DAL).

A fish (15 inches) tagged on Poquoson flats during fall 1998 (9/26/98) was recaptured in late winter 1999 (3/1/99) inside the Albemarle Sound (Pasquotank River, NC-156 DAL).

- *Mid-Bay Locations*: Similarly, two fish (17 and 14 inches) tagged 9/25-30 further up the Bay (*Parkers Island, VA*-just south of Onancock Creek) and in the *Piankatank River*, respectively, moved significant distances, the former recaptured at Cape Lookout, NC (on 11/21-57 DAL) and the latter in the Elizabeth River between Norfolk and Portsmouth (10/31-31 DAL); another drum (11.5 inches) tagged on 8/26/99 above the Rappahannock River mouth (in *Fleets Bay*) was recaptured at Kitty Hawk, NC (9/11-16 DAL).

2000

During 2000, about 780 small drum were tagged in Rudee Inlet waters and 113 recaptures reported (a 14.5 % reporting rate). Of these, 46 were relatively short-term recaptures (1-40 DAL) again showing that drum remain inside the inlet for significant periods. Similar patterns of movement and site fidelity to those described for spring and late summer-fall 1999 were again observed.

Recaptures of fish tagged in Lynnhaven waters again documented puppy drum moving from this area in late summer-fall out of the Bay and southward along North Carolina beaches. However, a

16 inch fish tagged at the end of May was recaptured June 25 (25 DAL) up the Bay around Watts Island (at the southern end of Tangier and Pocomoke Sounds).

Similarly, a 25 inch drum tagged and released on Poquoson Flats in early May was recaptured two weeks later (5/23) in Tangier Sound. In contrast, one of the most unusual recaptures during 2000 was a 17 inch drum, tagged by the same tagger as the previously described fish but one day earlier on Poquoson Flats (May 7). This fish moved out of the Bay, being recaptured in the Jacksonville, FL surf on 7/1/2000 (after only 55 DAL).

The increased tagging effort on puppy drum in 1999 produced some interesting longer-term recaptures during 2000. Two fish tagged during April 1999 in Rudee Inlet were recaptured in North Carolina waters, one in Roanoke Sound during February 2000 (312 DAL) and one at Oregon Inlet during April 2000 (342 DAL). Another fish (14 inch) also tagged during April 1999 in Rudee was recaptured in Lynnhaven Inlet in mid August 2000 (482 DAL).

Other long-time-at large recaptures during 2000 involved two large red drum (32 and 47 inches), one tagged during fall 1997 and the other in late spring 1998. The smaller fish, tagged 9/26/97 at Cape Point, NC, was recaptured 9/28/2000 (1,098 DAL/3 years post release) at Sandbridge (Little Island Fishing Pier south of Virginia Beach). The larger fish, tagged in the Cobb Island surf 6/5/98 was recaptured back at the same general location on 9/8/2000 (718 DAL/almost 2 years post release).

Rudee Inlet

- *Spring-tagged Drum Moving into Chesapeake Bay*

For fish largely 14-18 inches TL tagged primarily during spring (but a few as early as February 21-28 inside Rudee), nearly half (46) were recaptured still within the inlet after periods at large of 1-40 days. However, several fish tagged during this period demonstrated longer periods of site fidelity for Rudee, i.e., recaptured still inside the inlet from late April to mid May (after 49, 51, 55, 63, 67, and 72 DAL).

In contrast, some fish (primarily tagged from early March through mid-May) moved out of the inlet and were recaptured during April-early June at a variety of locations inside Chesapeake Bay. Recapture locations for individual fish were: Hampton Bar off Newport News (recaptured 4/15-37 DAL), Monitor-Merrimac Bridge Tunnel (4/29-23 DAL), Willoughby Bay and Willoughby Spit Jetties in Norfolk (5/12 and 6/12; 37 and 34 DAL, respectively), Harrison's Fishing Pier in Norfolk's Ocean View (5/20-48 DAL), the Hampton Roads Bridge Tunnel (5/22-36 DAL), James River Fishing Pier (5/31-34 DAL), Mobjack Bay rivers (the Ware on 5/6-52 DAL and the Severn on 5/27-78 DAL), Back River (6/4-63 DAL), Broad Bay inside Lynnhaven Inlet (6/4-82 DAL), and in the Elizabeth River (tagged 3/2-16 in Rudee; recaptured in the Norfolk-Portsmouth area and the Western Branch 6/5, 6/18, and 9/4; 92, 94, and 186 DAL, respectively).

Periodicity of movement, as well as a mixed pattern of “moving out/staying inside” Rudee during spring may be suggested by the example of fish recaptured in the Elizabeth River (the last recapture location previously listed). While these fish moved to the Elizabeth River (at least two of them prior to June 18), a number of fish tagged during the same March 2-16 period remained inside the inlet, being recaptured there from early April to mid May. Another example of pulses of fish moving out of Rudee in the spring involved recaptures of five Rudee-tagged fish at the Fort Monroe fishing pier, all on May 17-18. Having been tagged in Rudee from March 4-May 11, the fact that two of the fish had only been at large 7 and 11 days (tagged on May 6 and 11) suggests that they might have moved out of Rudee as a group in early May.

Bay Tag-Recaptures-2000

Poquoson Flats (7/1-68 DAL), Hungars Creek (bayside Eastern Shore) (7/8-83 DAL), and the Chesapeake Bay Bridge Tunnel (9/18 and 11/6-195 and 250 DAL).

North Carolina Tag-Recapture-2000

Another unusual 2000 drum recapture was a fish (32 inches) tagged in fall 1997 (9/26/97) at Cape Point, NC and recaptured on 9/28/2000 at the Sandbridge Fishing Pier (after 3 years/1098 DAL).

Only limited returns exist for fish over 40 inches TL from any location.