

## 2.0 DREDGING CLASSIFICATION SYSTEM FOR CREEKS

### 2.1 APPROACH

The development of a state dredging program which implements and meets the goals and objectives as discussed in the previous section should be based on three elements:

1. A system which can be used to classify any body of water in the Inland Bays as to its need and suitability for dredging
2. A set of specific, project-oriented questions which must be answered regarding each proposed dredging project
3. Specific performance standards which must be met during all dredging and disposal operations

This section discusses the development of the classification system for all Inland Bay waterways.

The system consists of three major "steps." Each step is actually a series of questions pertaining to a specific topic such as environmental suitability or navigational demand. Each creek is assessed using these questions and receives a specific ranking or classification based on the responses to the questions.

The steps are organized (1) to classify those areas that are environmentally sensitive to dredging, (2) to determine those areas of major boat use and (3) to determine where development and land use have generated heavy use of nearby waters. The steps and their overall objectives are listed below:

#### STEP ONE - ENVIRONMENTAL CLASSIFICATION

Objective: Classify, as areas where dredging should be restricted: creeks, creek segments, and open water areas with high environmental sensitivity.

#### STEP TWO - CLASSIFICATION BY WATER USE AND DREDGING HISTORY

Objective: To further segregate creeks into those which are characterized by intensive use and a recent dredging history and those which are less used and have not been previously dredged. Those areas which are both intensively used and have a recent dredging history will then be classified as being open to dredging.

STEP THREE - GENERATORS AND ATTRACTORS OF BOAT TRAFFIC

Objective: To further segregate the group remaining after Step II into those areas with or without navigational demand. The criterion used to determine navigational demand is the presence of generators and/or attractors to boat traffic as defined below.

The result of working through the three steps is the classification of all waters into three categories. If the water body in question meets any of the criteria in Step One, then it is classified as an area restricted to dredging. The use of the word restricted in this case does not mean prohibited; however, such waters would rank lowest in suitability for dredging projects. If the creek does not meet any of the environmental criteria, it then moves to Step II. Those areas meeting both water use and dredging history criteria are then classified as areas open to dredging. If the creek, channel, etc. does not satisfy both factors in Step II, it then moves to Step III - areas open to dredging but requiring further study. These areas are further broken down into Level I and Level II priorities based on current demand and usage. If the creek satisfies one or more factors, it is ranked as Level I, i.e., having existing use and demand. Otherwise it is classified as Level II, i.e., having little or no existing use or demand.

The actual explanation of the system is probably more complicated than using the system. A diagram of the process is contained in Pocket A at the end of this report. Maps of the designated areas are contained in Pocket B.

Each step is discussed in the following subsections. Data on individual creeks used in the evaluation are contained in Table 2-1.

2.2 ENVIRONMENTAL CLASSIFICATION

The objective of this first step is to determine which creeks should be restricted from dredging due to their environmental sensitivity or uniqueness. As stated previously, the word restricted does not mean prohibited but does indicate that these areas should be ranked lowest for proposed dredging projects.

Environmental sensitivity can be determined by many factors. In the Inland Bays, the presence of wetlands, wildlife refuges, shellfish beds, etc. are indicative of a high degree of sensitivity. The factors used are those for which information was generally available for all creeks and other water bodies being considered. If, for example, actual locations of shellfishing areas were known for all the areas, then this factor (i.e., the presence of high quality shellfishing beds) could be added to the criteria. New parameters can be added to this evaluation in

TABLE 2-1

## SUMMARY OF CREEK DESCRIPTIONS

Water Body/Shoreline Feature	Developments/Notes	Dredging History	Environmental Character
<b>REHOBOTH BAY</b>			
Shoreline (Dewey & Rehoboth Beach)	Very developed marinas: Pier Point - 150 slips; Rehoboth - 364 slips	Not dredged	
Lewis & Rehoboth Canal (southern end at Rehoboth Bay)	Bay Vista - entrance to man-made lagoon at 2 ft at low water - Nanticoke homes & trailers - community boat ramp - direct access to water	Federal project	
Bald Eagle Creek	Rehoboth Beach Yacht and Country Club located at Bald Eagle Point includes residential development on manmade lagoons) at northern end of creek - direct access to water	Proposed state project (1986)	10-15% of shoreline (1/4 mi.) in wetlands but only undeveloped southwest shore. Northeast shore includes extensive system of manmade lagoons - history of fish kills due to low D.O. levels
White Oak Creek/Johnson Branch	Large homes with shorefront boat access lining eastern shore Large trailer development at north end. Heavily developed between Oak Creek and Arnell Creek (Old Landing Woods North Hudson's Marina, two trailer parks/campgrounds, golf course, and large homes) (Lagoon development along western edge of neck-direct access to water)	Not dredged since 1970	White Oak Ck = 20-25% shoreline (1/4 mi) in wetlands. Johnson Branch - 15-20%. Western shore has marshes with ditches trans. to wooded areas.
Arnell Creek	Lagoon development along western edge of neck-direct access to water. Relatively undeveloped above mouth	Entrance dredged - state project part of Love Creek navig. channel (70-71)	10-15% of shoreline (1/4 mi) in wetlands. Vegetated banks/marsh trans. to woods along both shores, above mouth
Love Creek	Mulberry Knoll (lagoon) Love Creek Trailer Park Development concentrated where Route 24 crosses Creek. Love Ck Marina - 80 slips Boat Hole Marina - 70 slips Harriett's Bait & Tackle - 5 slips	State project - navig. channel (70-71) 168,000 cy	25-30% of shoreline (1/4 mi) in wetlands. Mouth of Love Canal - marshes, ponds, ditches, wooded areas/undeveloped West of Rte 24 undeveloped ag lands adjacent to marsh/wooded shores. Fish kill reported at Rte 24 bridge.
Herring Creek	Relatively undeveloped - two lagoons with only one to two homes	Herring Ck - state proj. - (78 & 81) includes both prongs (78) 20,000 cy (81) 60,000 cy	75-80% of shoreline (1/4 mi.) in wetlands. Ag lands and woods surrounding northern end

TABLE 2-1 (Continued)



Water Body/Shoreline Feature	Developments/Notes	Dredging History	Environmental Character
Hopkins Prong	Marina and SF home development	See Herring Creek	0% shoreline (1/4 mi) in wetlands - downstream segment 20-25% - upstream segment
Burton Prong	Pine Water Farm on land separating two prongs - large homes with boat docking facilities along shore. Angola by the Bay - wooded development with large SF homes - no lagoons. Large trailer park adjacent to Angola with boat docking facilities	Burton's Prong (83) 5,000 cy	1-5% 25-30% - upstream segment
Guinea Creek	Winding Creek Village	State project (77); navigation channel 75,450 cy	15-20% of shoreline (1/4 mi) in wetlands. Mouth undeveloped - agland/wooded.
Wilson Creek	Lagoons/bulkheaded - highly developed on eastern shore. Direct boat access	State project - navig. channel (83); 27,000 cy	65-70% of shoreline (1/4 mi) in wetlands. Fringe marsh on east and west shore.
Lee Joseph Creek	Lagoon Development - Bay City trailer park - large boat docking facility - some outer lagoons remain undeveloped Bayside Marina - assoc. with trailer park - Indian River North	Cozy Cove - state project (78-79); navig. channel 17,745 cy	40-45% shoreline (1/4 mi.) in wetlands Developed on eastern shore
Unnamed Creek - located east of Lee Joseph Creek	No existing development	Not dredged since 1970	100% shoreline in wetlands
Massy's Ditch and Landing/ Eastern Longneck	Very developed - large lagoon developments with many boat docking facilities Massey's Landing - 50 slips Indian River South Fisher's Park at Roman Pond White House Beach Boat House Pond Pots Nets Cove Rehoboth Yacht Club at Pots Nets	Massy's Ditch (waterway from inlet to Rehoboth Bay) - federal project	Shoreline directly fronting on Massy's Ditch" is 62% fringe marsh with marina and trailer park directly in back of marsh. West of Massy's Ditch is an island (Labens Pt., Raccoon Pt.) which is part marsh, part upland (created by dredged material disposal).
<b>INDIAN RIVER BAY</b>			
Indian River - Shoreline	Northern and southern shores relatively undeveloped to Millsboro/Swan Creek. Development increases at junction of river and Rtes. 24/30. Holls Landing State Park - ramp, no slips. Cupola Park - Millsboro - ramp and dockage. Bayside Marina - Millsboro - 70 slips	Indian River - federal project - (to Millsboro) State Proj. (83) from Millsboro to approximately Swann Creek 37,000 cy	

TABLE 2-1 (Continued)



Water Body/Shoreline Feature	Developments/Notes	Dredging History	Environmental Character
Lingo Creek	Pots Nets North Leisure Point Campground - boat docking facility	Not dredged since 1970	10-15% of shoreline (1/4 mi.) in wetland vegetation. Fish kills reported at boat lagoon and entire mouth of Lingo Creek.
Emily Gut	Developed along western shore bordering Indian River Riverdale/Oak Orchard - Large single family developments with boat docking facilities Marinas - Oak Orchard Indian River - 35 slips Haines Landing - 14 slips Vaillage Dock Marina - 5 slips Shorts Marina - ramp - several private boat clubs and one public boat ramp	Not dredged since 1970	10-15% of shoreline (1/4 mi.) in wetland vegetation. Fish kills reported in river in vicinity of Oak Orchard and Island Creeks.
Pepper Creek	Dogwood Acres - single family lagoons with boat facilities. (Dogwood Marina-22 slips) Kropper commercial shellfish operation on south shore. Timmons Boat Yard - 64 slips	Federal project to Holland Pt. Proposed state project (87) recently approved from Holland Pt. to approx. the power lines.	From mouth to Holland Pt. - 25-30% shoreline (1/4 mi.) in wetland vegetation. From Holland Pt. to Dagsboro - 90-95% shoreline in wetland vegetation (includes Palustrine Classification). Relatively undeveloped - ag land/marshes with some wooded area.
Vines Creek	New development/Elmer Cox/Bayview Park - south of Rte 26 Indian River Acres - lagoon devel. Marina (north of Rte. 26)	Proposed state project	20-25% shoreline (1/4 mi.) in wetlands vegetation.
Blackwater Creek	Bay Colony at mouth of Pepper and entrance to Blackwater Creek - few homes with docks. Blackwater Ck Village - along western shore - behind fringe marsh - no direct access to shoreline/water.	Not dredged	State Natural Area - shoal at entrance to creek protects creek - should remain in place 25-30% of shoreline in wetlands Very undeveloped - marsh edges ditched - trans. to woods - ag land
Simon Glade/Collins Creek aka Joshua and Edgar Prongs	Very undeveloped	Not dredged since 1970	65-70% of shoreline (1/4 mi.) in wetlands. Very undeveloped - marsh/wooded
White Creek	Highly developed with lagoons/single family homes/trailer parks on eastern shore. Gray's Acres Topside Marina Roger's Haven White Creek Manor Many boat docking facilities/marinas	State project, navig. channel (71-72)	25-30% of shoreline (1/4 mi) in wetlands - fringe marsh with development bordering landward edge of marsh.



TABLE 2-1 (Continued)

Water Body/Shoreline Feature	Developments/Notes	Dredging History	Environmental Character
Quillens Point/Beach Cove	Slightly developed Entrance to Fresh and Salt Ponds Lower end of Salt Pond developed Cotton Patch Campgrounds - TP	Loop Canal - state project	Access to Beach Cove restricted (silted)
Indian River Inlet	Burtons Island Marina - South Shore Marina - 100 slips Indian River Marina State Park - 257 slips.	Federal Project	
<u>LITTLE ASSAWOMAN BAY</u>			
Shoreline (Fenwick Is.)	Very developed marinas - Fenwick Landing - 63 slips N. Bay Marina - 48 slips	Not dredged	
Assaw. Canal	Scattered SF development along canal	Federal project - proposed	Currently silted in allowing little water exchange between Little Assaw. Bay and Indian River Bay
Jefferson Creek	Very large lagoon development	State project (82) - 38,820 cy	Fish kills reported in manmade lagoons
Miller Creek	Developed at upper end (near 1st bridge) with trailer park and boat access ramp Assawoman Wildlife Refuge borders shoreline(s) near mouth.	Not dredged since 1970	35-40% of shoreline (1/4 mi.) in wetlands
Dirickson Creek	Large trailer park w/lagoons - Swan Keys Assawoman Wildlife Refuge borders shoreline(s) near mouth.	Not dredged since 1970	40% shoreline in wetlands
Roy/Drum Creek	Very developed. Keen-wick Treasure Island Cape Windsor Edgewater Acres (lagoon devel.- TP) Direct water access	Proposed state project (87) Cape Windsor - existing state project (84) - 22,000 cy	65-70% of shoreline (1/4 mi.) in wetlands - mostly concentrated on Drum Ck.

FIGURE 2-1

STEP ONE: ENVIRONMENTAL CLASSIFICATION

- Objective: Classify, as areas where dredging should be restricted, creeks, creek segments, and open water areas with high environmental sensitivity.
- Factor One: Bodies of water and associated shorelines which have been designated as state natural areas, or which are totally contained in or where more than 50% of the shoreline borders a wildlife refuge or state/federal/parkland.
- Factor Two: Creek segments whose shorelines are dominated by wetland vegetation and which have open water channels equal to or less than 40 feet in width.
- Factor Three: Creek segments where the presence of rare and endangered species has been identified either in-stream or along the shoreline.
- Factor Four: Creek segments where at least 30% of the land area within 1/4 mile of the water's edge is contained in designated wetlands and is less than 50% developed (as moderate density residential development).

The following creeks, creek segments or water areas are restricted by:

<u>Factor One</u>	<u>Factor Two</u>	<u>Factor Three*</u>	<u>Factor Four</u>
Blackwater Ck. Miller Ck.	<u>Upstream reaches of:</u> Vines Ck. Pepper Ck. Herring Ck. - Hopkins Prong - Burton Prong - Guinea Ck. Wilson Ck. White Oak Ck. - Johnson Branch Collins Ck. - Joshua Prong (Simon Glade) - Edgar Prong White Ck. Arnell Ck. Dirickson Ck. Emily Gut Love Ck. Lingo Ck. Drum Ck. Roy Ck. Lee Joseph Ck.	<u>Upstream reaches of</u> <u>Love Ck.</u>	<u>Segments of:</u> Drum Ck. Dirickson Ck. Love Ck. - Dorman Branch Lingo Cove Joshua Cove- Sloughs Gut Collins Ck. - Joshua Prong - Edgar Prong Stump Ck. Swan Ck. Island Ck. Warwick Gut Emily Gut Lingo Ck. Several small unnamed creeks/ guts

\* May eventually list more creek segments here as the presence of both state and federally designated rare and endangered species is identified.

Footnote: Creeks less than 40 feet in width (headwaters and tributaries) and other areas not designated on the maps should not be considered for dredging by the State.

the future as data become available. For now, issues such as the presence of shellfish beds, nursery and spawning areas, submerged aquatic vegetation beds, etc. are left for the project specific evaluation factors discussed in Section 3.0.

Factor One is meant to protect areas designated for official protection such as State Natural Areas, parklands and wildlife refuges. Blackwater Creek, in its entirety, is in a Natural Area and is therefore restricted from dredging. Miller Creek is bordered on both shorelines by wildlife refuge and satisfies the "50-percent" criterion in this factor. This 50-percent criterion was added to distinguish between a case such as Miller Creek from Dirickson Creek, which also borders the refuge, but to a lesser extent.

Many of the upstream reaches or segments of the creeks under consideration meet the criteria of Factor Two. This factor is designed to rank as low priority those areas in which operation of the dredge results in the taking of wetlands bordering the channel. The average channel width created by the state dredge is a 30-to 40-ft wide, box-cut channel. Due to the slumping of the channel sides, the actual channel width can increase over time. Thus, it was generally felt that any creeks with open water widths equal to or less than 40 feet and which are bordered by wetlands should be avoided. These upstream reaches should be protected not only because of the bordering wetlands, but also because they are headwater areas that act as very important buffer zones between inland development and the estuarine waters.

Factor Three eliminates those areas where rare and endangered species have been identified either in-stream or along the shoreline. Much of the existing data are currently being compiled on this topic. The State is now developing a state-wide species list which, when finished, will be useful and may increase the number of creek segments listed under this factor. Love Creek is listed due to the siting of a bald eagle nest near the shoreline of the upstream reach.

Factor Four is meant to separate out creeks that are relatively undeveloped and are dominated by wetland vegetation. Many small guts, tidal streams, and small creeks satisfy these criteria. Table 2-1 contains statistics on percent shoreline in wetlands. This information was derived from U.S. Fish and Wildlife National Wetlands Inventory maps (1983) and includes both estuarine and palustrine classifications. It was found that the most undeveloped creeks in the inland bays average about 30 percent of their shoreline (1/4 mile inland) in wetlands. Smaller tidal streams in the large marshes bordering the bays, such as Collins Creek, contain a much higher percentage of wetlands (40 to 65 percent) because of the presence of such extensive marshes.



### 2.3 STEP TWO: CLASSIFICATION BY WATER USE AND DREDGING HISTORY

The objective of this step (shown in Figure 2-2) was to identify those channels, creeks, and creek segments that (1) are intensively used as access routes either to or between major water use areas, and (2) which have been previously dredged. Access routes leading to or between major use areas will be the channels most heavily used by vessels, and therefore those where navigability should be maintained. A prime example is Massey's Ditch, which serves as the major access route between Rehoboth Bay and Indian River Bay.

The intent of the first classification was to identify those channels which had existing heavy boating usage and which enabled vessels to travel to and from major water use areas. Using the language of transportation planning, this approach was intended to delineate the major arterials from the collector routes and side streets. The concern with vessel usage was with the total amount of vessel traffic. Therefore, this factor considered recreational and commercial boating traffic.

The second classification looked at the dredging history of major access channels. This was done to see if there was a recent history of providing or maintaining the navigability of these access channels by dredging. It was not assumed that because an access channel had been dredged in the past that it should automatically be classified as a segment to be dredged in the future. However, it was felt to be very likely that most or all of the identifiable access channels had been dredged in the past. Given the ongoing development of the Inland Bays region, it was felt to be highly unlikely that an access channel that had been previously dredged would not exhibit current high levels of vessel use.

The application of the first factor identified the following segments as major access routes:

- Indian River Navigation Channel
- Assawoman Canal (and approach channels)
- Lewes & Rehoboth Canal
- Rehoboth Bay Navigation Channel
- Massey's Ditch

Field investigations and contacts with knowledgeable local persons indicated several creeks with high levels of vessel traffic. However, these were heavily used collector routes leading from major shorefront generators of boating traffic (e.g., marinas, large shorefront residential developments, etc.) to major water use areas. They were not classifiable as major access routes between water use areas. These creeks (or portions thereof) are actually classified as suitable for dredging in the next step. These were Herring Creek, Love Creek, and Guinea Creek.

FIGURE 2-2

STEP TWO: CLASSIFICATION BY WATER USE AND DREDGING HISTORY

Objective: To further segregate creeks into those which are characterized by intensive use and a recent dredging history and those which are less used and have not been previously dredged. Those areas which are both intensively used and have a recent dredging history will then be classified as being open to dredging.

Factor One: Does the water body, creek or creek segment consistently and intensively used as an access route to, or between, the following types of boating activities:

- Recreational boating, including sailing, pontooning or excursions
- Recreational or commercial fishing, including shellfishing
- Water skiing, jet skiing, etc.
- Commercial transportation (i.e., hauling of commodities)
- Access channel connecting major water use areas

Factor Two: Has the water area, creek or creek segment been dredged by the State or Federal government?

Factor One and Factor Two:

- Assawoman Canal (and approach channels) (to be dredged for navigation purposes only. Future development projects requiring access to Assawoman Canal, structures that conflict with navigation, and projects which degrade water quality will be prohibited.)
- Indian River Navigation Channel
- Lewes & Rehoboth Canal
- Massey's Ditch
- Rehoboth Bay Navigation Channel

Footnote: As a general policy, the State should not dredge artificially constructed deadend lagoons unless it is for environmental rehabilitation or there are overriding concerns. If dredging is requested by incorporated communities, cost/benefit analysis should be conducted.

The analysis of dredging history indicated that Massey's Ditch, the Rehoboth Bay Navigation Channel, the Lewes & Rehoboth Canal, portions of the Indian River Channel and Assawoman Canal had been previously dredged. In addition, portions of Herring, Love, and Guinea Creeks had also been dredged.

The five major access routes were thus classifiable as being suitable for dredging because they meet both of the factors in this step and because of their current heavy use and prior dredging history, which in some cases went back further than 15 to 20 years.

The remaining creek segments in the Inland Bays region, including the four described above, were all determined conditionally acceptable for dredging, pending further analysis. Step Three was then used to differentiate between their suitabilities for dredging.

#### 2.4 STEP THREE: CLASSIFICATION BY PRESENCE OF GENERATORS AND ATTRACTORS OF BOATING TRAFFIC

The creeks remaining to be classified after Step Two were the tributary streams (e.g., the navigational collector routes) which emptied into one of the three bays or the Indian River. The goal of Step Three (illustrated in Figure 2-3) was to differentiate these creeks on the basis of their existing boating traffic. The level of boating traffic along a creek was assumed to be determined by two factors: (1) the presence of shorefront uses such as a marina, a waterfront residential development with waterfront docks, or other waterfront commercial or industrial use regularly visited by boats; and (2) the intensity of development in the surrounding watershed. Development within a watershed in a recreational area such as the Inland Bays region indicates that inevitably there will be demand for waterfront facilities such as marinas and boat launching ramps, and for navigational access along creeks, even if the shorefront is currently undeveloped.

All creeks remaining unclassified after Step Two were reviewed using the four Step III criteria. If a creek or creek segment met at least one of the criteria, it was classified as Level I in terms of its dredging priority. If not, it was classified as a Level II.

Streams designated as Level I are those where there is significant current navigational demand due primarily to the presence of attractors or generators of boating traffic. These are creeks and creek segments, that, although they are not major navigational access routes between water use areas, do have boating use levels that will have to be maintained by dredging on an as-needed basis. In some cases, Level I creeks have substantially developed watersheds such that boating use levels are either high enough at present to warrant dredging when required, or will inevitably have such levels due to clearly evident development pressures.

FIGURE 2-3

STEP THREE: GENERATORS AND ATTRACTORS OF BOAT TRAFFIC

Objective: To further segregate the group remaining after Step II into those areas with or without navigational demand. The criteria used to determine navigational demand is the presence of generators and/or attractors of boat traffic as defined below.

Factor One: The presence of a marina with one of the following characteristics\*:

- Publicly accessible marina with more than 25 slips
- Significant proportion of vessels using marina have drafts exceeding 4' and lengths exceeding 25'
- Publicly accessible boat launching ramp
- Private marina with more than 100 slips

Factor Two: The presence of a residential subdivision, campground or trailer park with more than 50 units and which has either an accompanying marina, or whose parcels front on boat channel.

Factor Three: The presence of waterfront recreational, industrial or commercial activities that are regularly visited by vessels with drafts exceeding 2'.

Factor Four: At least 50 percent of the land area located within 1/2 mile of the creek or creek segment is developed at a minimum as moderate density residential (i.e., at least one dwelling unit/acre).

If at least one of the factors is present, classify as Level I; if none of the factors are present, classify as Level II. Level I creeks are higher priority projects as they satisfy the navigational demand criteria. Level II creek exhibit little current demand or use.

Level I Creek Segments\*\*

Love Creek (up to first bridge)  
Arnell Creek (mouth only)  
Guinea Creek (up to bridge)  
Lingo Creek  
Pepper Creek (up to Holland Pt)  
Vine Creek (up to Ballast Pt)  
Dirickson Creek  
Roy Creek  
Herring Creek  
- Burton Prong  
- Hopkins Prong  
- Wilson Creek (mouth only)  
- Lee Joseph Creek (mouth only)

Level II Creek Segments\*\*

Bald Eagle Creek  
White Oak Creek (mouth only)  
Emily Gut (mouth only)  
Beach Cove  
Vines Creek (from Ballast Pt  
to first bridge)

\* These requirements were developed for marinas near the creek mouths or on the bays. The marina size and facility requirements increase the farther upstream it is located due to related dredging costs and environmental impacts.

\*\* These are only portions of the creeks listed under each level as illustrated on the set of maps accompanying this report.

Presented below is a review of each of the four factors in Step Three, with a listing of the creeks and creek segments that meet each one.

Factor one is the presence of a marina with one of the following characteristics:

- Publicly accessible marina with more than 25 boat slips
- Publicly accessible boat launching ramp
- Private marina with more than 100 boat slips

Due to related dredging costs and environmental impacts, the farther upstream a project is planned, the marina size and facility requirements will increase with increased distance away from the creek mouth.

The three creeks noted above as having been previously dredged (Herring, Love and Guinea) were classified as Level I segments. They all have either publicly accessible marinas, publicly accessible boat launching ramps or private marinas.

Many of the remaining creeks and creek segments classified as Level I were done so on the basis of Factor Two. The presence of large waterfront developments with lot-side docks and private marinas or boat launching facilities were found on: Burton Prong, Hopkins Prong, Lingo Creek, portions of Vines and Pepper Creeks, and Dirickson Creek.

The remaining Level I creeks and creek segments were classified on the basis of either Factors Three or Four. As an example, Pepper Creek does not have large waterfront developments located along its shore, but it does have several waterfront activities regularly visited by large crafts, such as the Timmons Boat Yard. The lower portion of Arnell Creek is heavily developed.

Those creeks or creek segments that did not meet any one of the four factors used in Step Three were classified as Level II creek segments. There are few creek segments falling into this category mainly because they were eliminated by Factor Four in Step One which restricts from consideration those creek areas with little development. This meant that they did not have current significant boating traffic along their lengths. In general, they had not yet been developed to the intensity of the Level I creeks and creek segments. In some instances, such as White Oak and Bald Eagle Creeks, there was some waterfront development, primarily low density residential, and often located at their mouths; however, these streams did not have large, medium- to high-density recreational developments along their shores, nor did they have large marinas or other significant attractors/generators of boating traffic.

## 2.5 CASE STUDY - ROY CREEK

Roy Creek was used as a "case study" for the classification system. Located off of Assawoman Bay, Roy Creek is heavily developed on its northern shore and in the headwaters. It does not satisfy any of the criteria in Step One; however, Drum Creek, a tributary, does "fall out" under Factor Four. Roy Creek is also not a major navigational connector between two large boat use areas such as the Lewes and Rehoboth Canal or Massey's Ditch; nor has it been previously dredged. Therefore it did not satisfy the criteria in Step II. However, it was classified as a Level I stream up to the point that it becomes too narrow to dredge without negatively affecting shoreline wetland vegetation and/or banks. The implication of this classification is that Roy Creek currently has significant boating activity that should be maintained on an as-needed basis by dredging. The primary reasons for this classification were (1) the presence on its lower portion of several large waterfront developments, which are substantial generators and attractors of boating traffic, and (2) the presence of existing and future development pressures within its watershed. The developments include Keen-Wik, Treasure Island, and Cape Windsor. The area surrounding the lower segment of the Creek was also determined to exceed the Factor Four development criterion.

This classification is consistent with the existing zoning designation, which classifies most of the northern shore of the stream as medium-density residential. The area around the creek is currently served by the Fenwick Island section of the South Coastal Region Sewer District. Under the Draft Coastal Sussex Land Use Plan, the area around Roy Creek is proposed as a Village Development District.