



**JAMES RIVER INDUSTRIAL CENTER  
RIVERFRONT DEVELOPMENT**

**FLOODPLAIN IMPACT ANALYSIS  
TECHNICAL SUPPORT DATA NOTEBOOK  
JAMES RIVER  
CHESTERFIELD COUNTY, VIRGINIA**

**ORIGINAL SUBMITTAL: SEPTEMBER 10, 2020  
REVISED SUBMITTAL: FEBRUARY 19, 2021**

**PREPARED BY:  
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**TG Project Number: 43158**

**TABLE OF CONTENTS**

1.0 PROJECT SUMMARY ..... 1

2.0 HYDROLOGIC SUMMARY ..... 1

3.0 HYDRAULIC SUMMARY ..... 2

    3.1 DUPLICATE EFFECTIVE..... 2

    3.2 CORRECTED EFFECTIVE MODEL..... 3

    3.3 EXISTING CONDITIONS MODEL ..... 3

    3.4 PROPOSED CONDITIONS MODEL..... 5

4.0 RESULTS ..... 7

5.0 CONCLUSIONS..... 7

**LIST OF APPENDICES**

APPENDIX 1 ..... No-Rise Certification

APPENDIX 2 ..... Annotated FIRM

APPENDIX 3 ..... Floodplain Work Map

APPENDIX 4 ..... Endangered Species Act

APPENDIX 5 ..... Digital Data



## 1.0 Project Summary

A floodplain analysis study has been completed on a reach of the James River located within Chesterfield County, Virginia to determine the impacts, if any, associated with the placement of fill at the James River Industrial Center Riverfront Development. The limits of the study extend upstream from FEMA section C to FEMA section F as depicted on the effective FEMA Flood Insurance Rate Map (FIRM) map number 51041C0169D dated December 18, 2012 for Chesterfield County Virginia, see Appendix 3. No-Rise Certification approval is being requested for the project, see Appendix 1. A CLOMR is being requested to provide for the change in floodway required as a result of updated modeling methods and best available data.

The James River, in the vicinity of the proposed project, is mapped by FEMA as Zone AE with floodway and Base Flood Elevations (BFEs). The southern shore of the James River forms the county boundary for Henrico County and Chesterfield County in this location. As such, established BFEs for the James River are reported in both the Chesterfield County and Henrico County effective Flood Insurance Studies (FIS). The effective FIS (51041CV000A) for Chesterfield County, Virginia is dated effective December 18, 2012. The same reach of the James River is also published in the Henrico County FIS (51087CV000A) effective date December 18, 2007. It is noted that the Chesterfield County FIS is published with elevations referencing the NGVD29 datum while the Henrico County FIS is published with elevations referencing the NAVD88 datum. Cross sections located in the Henrico County FIS are located in the same physical location as the cross sections in the Chesterfield County FIS, however, they are named differently in the studies. An annotated FIRM is provided in Appendix 2.

A request for the effective stream model was made of FEMA, however, no effective hydraulic model was located. Therefore, a duplicate model was built using cross section locations as downloaded from the National Flood Hazard Layer (NFHL) website (<https://www.fema.gov/national-flood-hazard-layer-nfhl>) and other data published in the effective FIS. The FEMA reviewer assigned to the case provided HEC2 output files for the study, however, no HEC2 input file was located for the effective model. This duplicate model serves as the basis for this flood study.

This study demonstrates that there will be no changes to the base flood water surface elevations as a result from the placement of earthen fill at the James River Industrial Center (JRIC) Riverfront Development site as part of an economic development project and provides for a change to the floodway designation on the subject property. Submittals will be made in the future for site plan approval and associated environmental and land disturbing permits. A WorkMap, see Appendix 3, has been prepared for this study that shows the proposed JRIC project in relation to elements of the supporting flood study. The hydraulic analysis was performed based on the created duplicate effective stream model data using **HEC-RAS (v.5.0.7)**.

## 2.0 Hydrologic Summary

This flood study utilizes the flow discharges published in the effective Flood Insurance Study (FIS) for the James River. Table 1 provides discharges presented in the Effective FIS for this reach of the James River. The published discharges were inputted into the duplicate effective

model. No additional hydrologic analysis was performed.

**Table 1. Summary of Discharges as Published in the Effective FIS**

Summary of Discharges <sup>1</sup>					
Location	Drainage Area (sq. miles)	10-Year (cfs)	50-Year (cfs)	100-Year (cfs)	500-Year (cfs)
At the Westham gauge	6,758	131,000	232,000	290,000	475,000

<sup>1</sup> Effective discharges and location descriptions taken from Table 3 in the effective FIS for Chesterfield County (FIS Number 51041CV000A, Effective 12/18/2012, published by FEMA)

### 3.0 Hydraulic Summary

This section details the various model progression completed as part of this study. The following model progressions have been completed: Duplicate Effective, Existing Conditions and Proposed Conditions.

#### 3.1 Duplicate Effective

A Duplicate model was created for the study reach utilizing various data sources. The flow file was created using the published discharges for the James River in the Chesterfield & Henrico County FIS. Because this model is a truncated model, the boundary condition for each flow profile was set at known water surface elevations as taken from the provided effective HE2 model output file and corrected for datum (NGVD – 1.04 = NAVD). The following details how the geometry file for the Duplicate model was established:

- Cross section locations were taken from GIS data downloaded from the FEMA NFHL Viewer.
- Cross sectional geometry for the overbank areas was based on a composite surface developed from Henrico County and Chesterfield County GIS topography (1-ft contours) and field surveyed data (2019) referencing the NAVD88 datum.
- Cross-sectional geometry for the river channel (below bank stations) was based on an assumed trapezoidal channel section and channel invert elevations were taken from the James River profile published in the effective FIS. The trapezoidal channel under the bank stations was iterated until predicted water surface elevations best aligned with the published water surface elevations in the FIS.
- Manning’s n-values were established for the overbank areas based on aerial photography land cover conditions and with deference to the range of Manning’s values published in the FIS for the subject reach of the James River. The Manning’s n-values were iterated (within the published range in the FIS) until the predicted water surface elevations of the Duplicate Model best aligned with the published water surface elevations in Table 5 of the FIS.
- Reach lengths were measured in CAD.
- Floodway encroachment stations were established based on measurements along each cross section to the mapped floodway limits and entered using Method 1.

The duplicate model was developed based on the NAVD88 datum. The duplicate model ties with the regulatory BFE at FEMA section F (Chesterfield County FIS) within 0.5-ft. See Table 2 for a comparison of published regulatory BFEs with those calculated in the Duplicate model. See Table 3 for a summary of Floodway Data comparing the Regulatory and Duplicate models.

**Table 2. Comparison Between Regulatory and Duplicate Effective 100-yr WSEs (No Encroachments)**

Chesterfield FEMA Section	Henrico FEMA Section	River Sta	Profile	Effective Model HEC2 Output <sup>2</sup>	DUPLICATE NAVD88 (ft)	COMPARE <sup>1</sup> DUPLICATE AND EFFECTIVE MODEL (ft)
				NAVD88 (ft)		
F	E	26141.03	100yr	20.10	19.97	-0.13
E	D	24266.48	100yr	19.79	19.57	-0.22
D	C	22474.38	100yr	19.58	19.33	-0.25
C	B	19882.87	100yr	18.87	18.87	0.00

<sup>1</sup>The Compare column is taken as the difference between the Duplicate Effective and Effective Model HEC2 Output WSE using NAVD88 datum values.

<sup>2</sup>The HEC2 Output water surface elevations have been corrected for vertical datum change.

**Table 3. Summary of Floodway Data: Regulatory and Duplicate Effective**

FEMA Lettered Section (Chesterfield County)	FEMA Lettered Section (Henrico County)	HEC- RAS River Station	FEMA (FIS)*			Duplicate Effective Model		
			With Floodway	Without Floodway	Increase	With Floodway	Without Floodway	Increase
			NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)
F	E	26141.03	20.7	20.1	0.6	20.83	19.97	0.86
E	D	24266.48	20.4	19.8	0.6	20.50	19.57	0.93
D	C	22474.38	20.2	19.6	0.6	20.28	19.33	0.95
C	B	19882.87	19.6	18.9	0.7	19.58	18.87	0.71

\*Water surface elevations taken from the Henrico County FIS (published in NAVD88).

### 3.3 Existing Conditions Model

The Duplicate Effective Model served as the basis for the Existing Conditions Model. Several new cross sections were inserted into the model along the James River in the vicinity of the project site. The geometry of the new cross sections was based on the composite digital terrain surface created for the project. Manning’s-n values were assigned based on aerial photography and with deference to n-values assigned in the Duplicate Effective model. Reach lengths were established based on measurements in CAD.

The floodway encroachments stations were re-evaluated and iterated to achieve a valid floodway run.

A summary of model revisions required to create the Existing Conditions model is presented in Table 4. Table 5 presents a comparison of Base Flood Elevations (BFE’s) between the Duplicate Effective and Existing Conditions models. A summary of the Floodway model in comparison to the Regulatory and Duplicate Effective model as shown in Table 6.

**Table 4. Summary of Model Revisions for the Existing Conditions Model.**

<b>HEC-RAS RIVER STATION</b>	<b>EDIT #</b>	<b>SUMMARY OF EDITS</b>
26141.03	1	Updated reach lengths.
25783.63	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
25440.42	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
24867.46	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
24266.48	1	Updated reach lengths.
23707.46	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data.
23321.53	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
22976.74	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
22122.88	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
21711.96	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
21272.41	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
20814.94	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
20352.24	1	New section. Applied trapezoidal channel geometry to channel area below water surface. Overbank geometry based on terrain data. Reach lengths determined. Established Manning's n-values.
All Sections	1	Revised encroachment stations.

**Table 5. Comparison between Existing Conditions and Duplicate Effective Models Results (100-year) (No Encroachments)**

FEMA Lettered Section (Chesterfield County)	FEMA Lettered Section (Henrico County)	HEC-RAS River Station	Regulatory BFE <sup>1</sup>	Duplicate Effective Model	Existing Conditions Model	Compare Existing and Duplicate <sup>2</sup>
			NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	Δ WSE (ft)
F	E	26141.03	20.1	20.28	19.86	-0.11
---	---	25783.63	---	---	19.82	---
---	---	25440.42	---	---	19.82	---
---	---	24867.46	---	---	19.56	---
E	D	24266.48	19.8	19.99	19.43	-0.14
---	---	23707.46	---	---	19.05	---
---	---	23321.53	---	---	19.1	---
---	---	22976.74	---	---	19.1	---
D	C	22474.38	19.6	19.58	18.99	-0.34
---	---	22122.88	---	---	18.66	---
---	---	21711.96	---	---	18.78	---
---	---	21272.41	---	---	18.93	---
---	---	20814.94	---	---	19.01	---
---	---	20352.24	---	---	18.97	---
C	B	19882.87	18.9	18.87	18.87	0.00

<sup>1</sup> BFEs taken from the Henrico County FIS (published in NAVD88).

<sup>2</sup>The Compare column is taken as the difference between the Existing Conditions and Duplicate Effective WSEs

**Table 6. Summary of Floodway Data: Duplicate Effective Model & Existing Conditions**

FEMA Lettered Section (Chesterfield County)	FEMA Lettered Section (Henrico County)	HEC-RAS River Station	FEMA (FIS)*			Existing		
			With Floodway	Without Floodway	Increase	With Floodway	Without Floodway	Increase
			NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)
F	E	26141.03	20.7	20.1	0.6	20.75	19.86	0.88
---	---	25783.63	---	---	---	20.73	19.82	0.91
---	---	25440.42	---	---	---	20.73	19.82	0.92
---	---	24867.46	---	---	---	20.46	19.56	0.90
E	D	24266.48	20.4	19.8	0.6	20.35	19.43	0.92
---	---	23707.46	---	---	---	19.97	19.05	0.92
---	---	23321.53	---	---	---	20.09	19.10	0.99
---	---	22976.74	---	---	---	20.09	19.10	0.99
D	C	22474.38	20.2	19.6	0.6	19.97	18.99	0.98
---	---	22122.88	---	---	---	19.58	18.66	0.92
---	---	21711.96	---	---	---	19.69	18.78	0.91
---	---	21272.41	---	---	---	19.73	18.93	0.81
---	---	20814.94	---	---	---	19.82	19.01	0.81
C	B	20352.24	19.6	18.9	0.7	19.77	18.97	0.80

\*Water surface elevations taken from the Henrico County FIS (published in NAVD88).

### 3.4 Proposed Conditions Model

The Existing Conditions Model served as the basis for the Proposed Conditions Model. The proposed fill area was entered in the model starting at station 25783.63 and extending to station 23707.46, see Workmap in Appendix 3. Manning’s n-coefficients for the fill area have been revised to reflect a tall grass land cover. Table 9 provides a summary of all edits to the Proposed Conditions Model. Encroachment stations for the floodway profile were not modified from the Existing Conditions model.

A summary of model revisions required to create the Existing Conditions model is presented in Table 7. A comparison of computed Base Flood Elevations (BFE’s) for the Existing Conditions and Proposed Conditions model is presented in Table 8. A summary of the Proposed Conditions floodway model in comparison to the Regulatory and Existing Conditions model is shown in Table 9.

**Table 7. Summary of Model Revisions for the Proposed Conditions Model**

HEC-RAS RIVER STATION	EDIT #	SUMMARY OF EDITS
25783.63	1 2	Altered cross section geometry to include the grading from the proposed fill area. Manning’s n-value in fill area revised to 0.035.
25440.42	1 2	Altered cross section geometry to include the grading from the proposed fill area. Manning’s n-value in fill area revised to 0.035.
24867.46	1 2	Altered cross section geometry to include the grading from the proposed fill area. Manning’s n-value in fill area revised to 0.035.
24266.48	1 2	Altered cross section geometry to include the grading from the proposed fill area. Manning’s n-value in fill area revised to 0.035.
23707.46	1 2	Altered cross section geometry to include the grading from the proposed fill area. Manning’s n-value in fill area revised to 0.035.

**Table 8. Comparison Between Proposed and Existing Conditions Model Results (100-year) (No Encroachments)**

FEMA Lettered Section Chesterfield County	FEMA Lettered Section Henrico County	HEC-RAS River Station	Regulatory BFE <sup>1</sup>	Existing Conditions Model	Proposed Conditions Model	Compare Proposed and Existing <sup>2</sup>
			NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	Δ WSE (ft)
F	E	26141.03	20.1	19.86	19.86	0.00
---	---	25783.63	---	19.82	19.82	0.00
---	---	25440.42	---	19.82	19.82	0.00
---	---	24867.46	---	19.56	19.56	0.00
E	D	24266.48	19.8	19.43	19.43	0.00
---	---	23707.46	---	19.05	19.05	0.00
---	---	23321.53	---	19.1	19.1	0.00
---	---	22976.74	---	19.1	19.1	0.00
D	C	22474.38	19.6	18.99	18.99	0.00
---	---	22122.88	---	18.66	18.66	0.00
---	---	21711.96	---	18.78	18.78	0.00
---	---	21272.41	---	18.93	18.93	0.00
---	---	20814.94	---	19.01	19.01	0.00



FEMA Lettered Section Chesterfield County	FEMA Lettered Section Henrico County	HEC-RAS River Station	Regulatory BFE <sup>1</sup>	Existing Conditions Model	Proposed Conditions Model	Compare Proposed and Existing <sup>2</sup>
			NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	Δ WSE (ft)
---	---	20352.24	---	18.97	18.97	0.00
C	B	19882.87	18.9	18.87	18.87	0.00

<sup>1</sup> BFEs taken from the Henrico County FIS (published in NAVD88).

<sup>2</sup> The Compare column is taken as the difference between the Proposed and Existing Conditions WSEs.

**Table 9. Comparison of Floodway Results for Existing and Proposed Conditions Models**

FEMA Lettered Section (Chesterfield County)	FEMA Lettered Section (Henrico County)	HEC-RAS River Station	Existing Conditions Model			Proposed Conditions Model		
			With Floodway	Without Floodway	Increase	With Floodway	Without Floodway	Increase
			NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)	NAVD 88 (ft)
F	E	26141.03	20.75	19.86	0.88	20.75	19.86	0.88
---	---	25783.63	20.73	19.82	0.91	20.73	19.82	0.91
---	---	25440.42	20.73	19.82	0.92	20.73	19.82	0.91
---	---	24867.46	20.46	19.56	0.90	20.46	19.56	0.90
E	D	24266.48	20.35	19.43	0.92	20.35	19.43	0.92
---	---	23707.46	19.97	19.05	0.92	19.97	19.05	0.92
---	---	23321.53	20.09	19.10	0.99	20.09	19.10	0.99
---	---	22976.74	20.09	19.10	0.99	20.09	19.10	0.99
D	C	22474.38	19.97	18.99	0.98	19.97	18.99	0.98

## 4.0 Results

Water surface elevations for the 100-yr floodplain have been calculated for each of the model progressions and comparisons between model progressions have been provided. The Proposed Conditions model indicates that as a result of the proposed fill placement:

- There will be no changes (0.00-ft) in Base Flood Elevations for the 100-year storm event when compared to the Existing Conditions model at all cross sections analyzed.
- There will be no changes (0.00-ft) in the floodway elevations when compared to the Existing Conditions model at all cross sections analyzed.

A No-Rise certification is requested to allow for the placement of fill as indicated on the attached Workmap, see Appendix 3. A floodway revision is also requested as part of this submittal.

## 5.0 Conclusions

The 100-year floodplain elevations reflected in this report were determined in accordance with standard hydraulic modeling techniques. The findings of this hydraulic analysis have been made on the basis of the Duplicate effective modeling information created for the project. The prepared hydraulic models supporting this flood study were reviewed within CheckRAS to provide increased confidence in the model inputs. The 100-yr floodplain elevations and boundaries reflected in this report have been determined in accordance with standard hydraulic techniques and in accordance.

While this study has been conducted in accordance with generally accepted hydrologic and hydraulic modeling practices, there is always the potential that future conditions may cause or contribute to flooding not represented in this report. Larger floods may be expected to occur on occasions and flood heights may be increased by man-made or natural causes such as restricted bridge openings due to debris. This study accurately and reasonably represents the Flood Hazard Areas associated with the James River for the modeled storm events.

**APPENDIX 1**  
**NO RISE CERTIFICATION**

NO-RISE CERTIFICATION

This document is to certify that I am a duly qualified engineer licensed to practice in the Commonwealth of Virginia. It is to further certify that the attached technical data supports the fact that the proposed James River Industrial Center Riverfront Development Project will not increase the base flood elevations, floodway elevations or impact the floodway widths, on the James River at published cross-sections in the Flood Insurance Study for Chesterfield County (Community Number 510035), effective date December 18, 2012 and will not increase the base flood elevations, floodway elevations or impact the floodway widths at unpublished cross-sections in the area of the proposed development.



Sheila S. Reeves, PE, CFM

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Title

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Address

02/27/2020

Date

FOR COMMUNITY USE ONLY

APPROVED

DISAPPROVED

\_\_\_\_\_  
Name and Title

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**APPENDIX 2**  
**ANNOTATED FIRM**

**NATIONAL FLOOD INSURANCE PROGRAM**

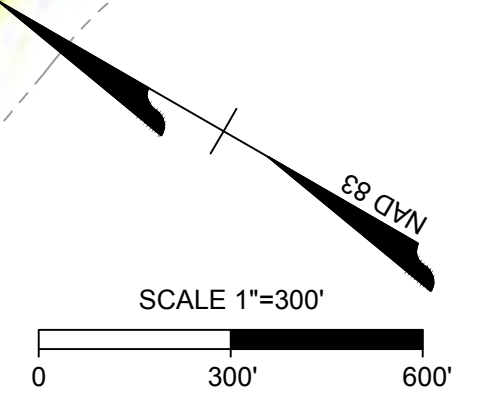
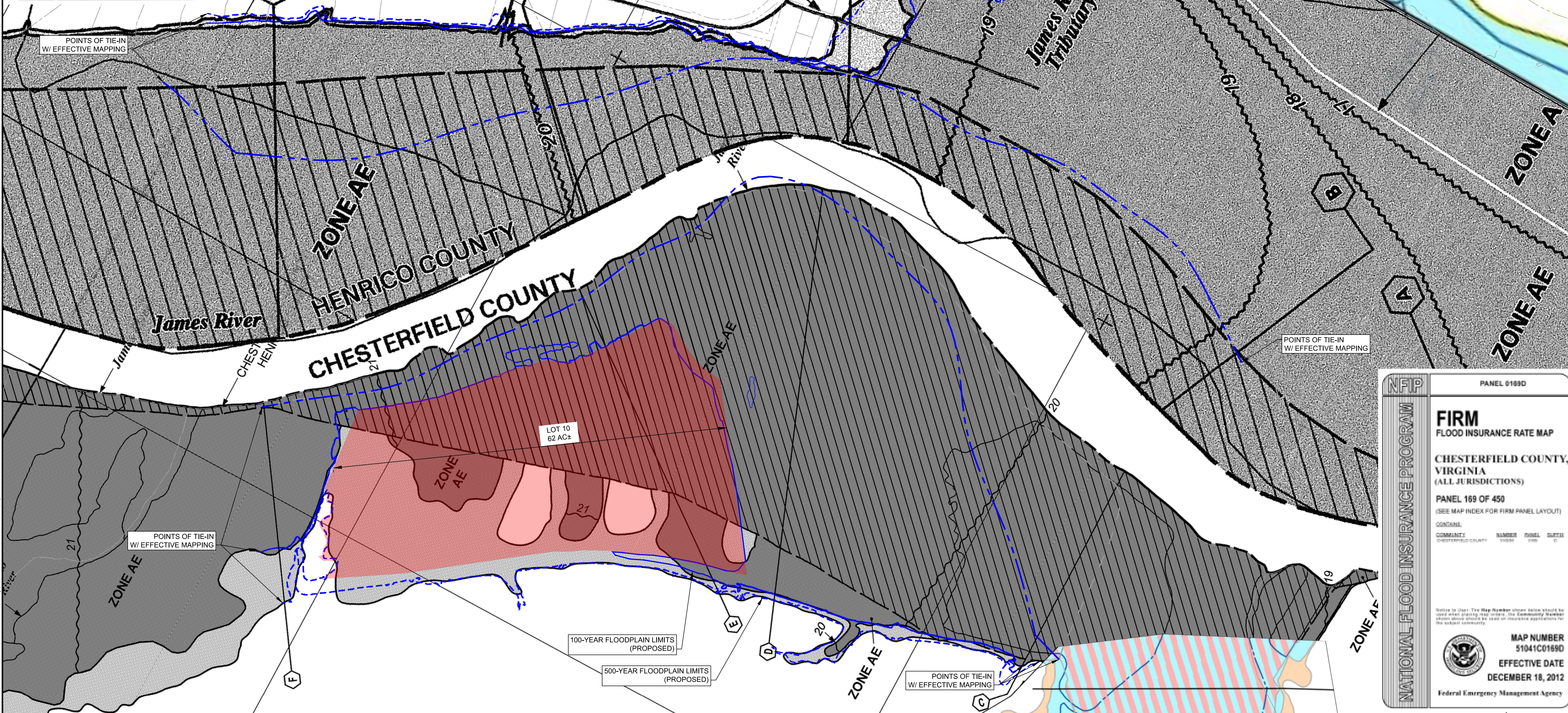
**FIRM FLOOD INSURANCE RATE MAP**  
HENRICO COUNTY, VIRGINIA AND INCORPORATED AREAS

**PANEL 220 OF 300**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:  
COMMUNITY: HENRICO COUNTY NUMBER: 51087C0220C PANEL: 220 OF 300

MAP NUMBER 51087C0220C  
EFFECTIVE DATE: DECEMBER 18, 2007

Federal Emergency Management Agency



**NATIONAL FLOOD INSURANCE PROGRAM**

**FIRM FLOOD INSURANCE RATE MAP**  
CHESTERFIELD COUNTY, VIRGINIA (ALL JURISDICTIONS)

**PANEL 169 OF 450**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:  
COMMUNITY: CHESTERFIELD COUNTY NUMBER: 51041C0169D PANEL: 169 OF 450

MAP NUMBER 51041C0169D  
EFFECTIVE DATE: DECEMBER 18, 2012

Federal Emergency Management Agency

- NOTES:**
1. THIS ANNOTATIVE FIRM IS PRESENTED FOR **INFORMATIONAL PURPOSES ONLY**.
  2. FEMA FIRM PANELS SHOWN ON THIS SHEET ARE MAP NUMBERS 51041C167D, 51041C169D, 51087C0220C EFFECTIVE DATE 12/18/2012.
  3. FIRM MAPPING WAS DOWNLOADED FROM THE FEMA MAP SERVICE CENTER AND ROTATED AND SCALED BY THE ENGINEER. THE SPATIAL POSITION OF THE MAPPING SHALL BE CONSIDERED APPROXIMATE.

**LEGEND**

	100-YEAR FLOODPLAIN LIMITS (PROPOSED)
	500-YEAR FLOODPLAIN LIMITS (PROPOSED)
	FLOODWAY (PROPOSED)

FOR INFORMATIONAL PURPOSES ONLY

THIS DRAWING PREPARED AT THE  
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YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
04/19/2021 <td></td>	

DRAWN BY: I. GORDON  
DESIGNED BY: I. GORDON  
CHECKED BY: S. REEVES  
SCALE: 1" = 300'

**TIMMONS GROUP**

**JAMES RIVER INDUSTRIAL CENTER**  
CHESTERFIELD & HENRICO COUNTIES, VIRGINIA  
ANNOTATED FIRM PANELS

JOB NO. 43158  
SHEET NO. ANNOFIRM

L:\2024\158-Kingsland-Crk-Hot-DWGS-Sheet\E:\mbr43158 - ANNOTATED FIRM.dwg | Printed on 4/19/2021 11:01 AM | by Ian Gordon

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# **APPENDIX 3**

## **WORKMAP**



THIS DRAWING PREPARED AT THE  
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 TEL: 534.293.5624 FAX: 534.293.8317 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
04/19/2021	
	DRAWN BY I. GORDON
	DESIGNED BY I. GORDON
	CHECKED BY S. REEVES
	SCALE 1" = 400'

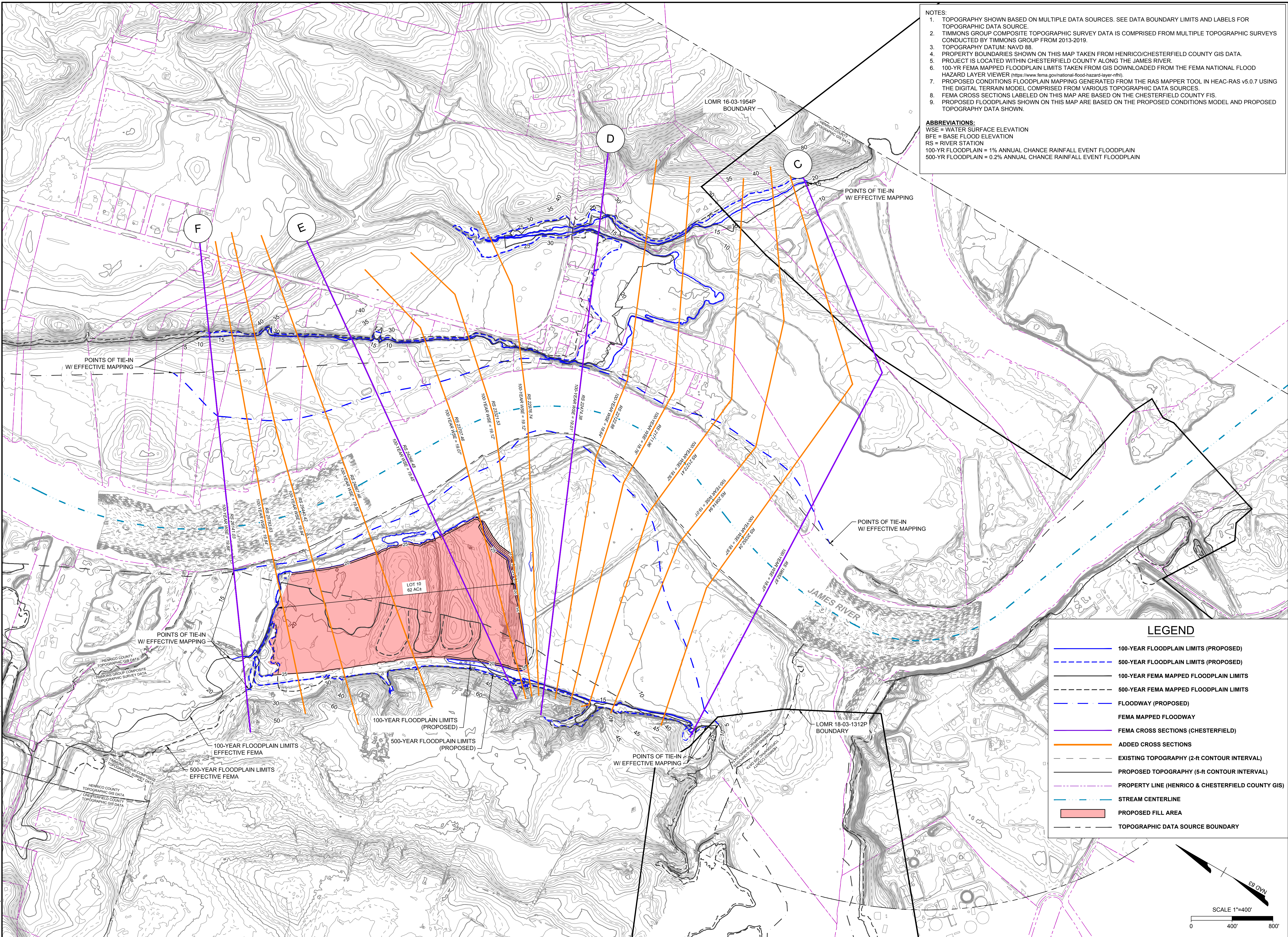
**JAMES RIVER INDUSTRIAL CENTER**  
 CHESTERFIELD COUNTY, VA  
**WORKMAP**

JOB NO.  
**43158**  
 SHEET NO.  
 WORKMAP

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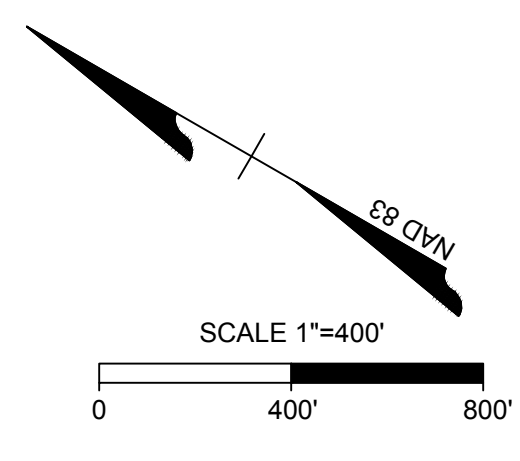
- NOTES:**
- TOPOGRAPHY SHOWN BASED ON MULTIPLE DATA SOURCES. SEE DATA BOUNDARY LIMITS AND LABELS FOR TOPOGRAPHIC DATA SOURCE.
  - TIMMONS GROUP COMPOSITE TOPOGRAPHIC SURVEY DATA IS COMPRISED FROM MULTIPLE TOPOGRAPHIC SURVEYS CONDUCTED BY TIMMONS GROUP FROM 2013-2019.
  - TOPOGRAPHY DATUM: NAVD 88.
  - PROPERTY BOUNDARIES SHOWN ON THIS MAP TAKEN FROM HENRICO/CHESTERFIELD COUNTY GIS DATA.
  - PROJECT IS LOCATED WITHIN CHESTERFIELD COUNTY ALONG THE JAMES RIVER.
  - 100-YR FEMA MAPPED FLOODPLAIN LIMITS TAKEN FROM GIS DOWNLOADED FROM THE FEMA NATIONAL FLOOD HAZARD LAYER VIEWER (<https://www.fema.gov/national-flood-hazard-layer-nflv>).
  - PROPOSED CONDITIONS FLOODPLAIN MAPPING GENERATED FROM THE RAS MAPPER TOOL IN HEAC-RAS v5.0.7 USING THE DIGITAL TERRAIN MODEL COMPRISED FROM VARIOUS TOPOGRAPHIC DATA SOURCES.
  - FEMA CROSS SECTIONS LABELED ON THIS MAP ARE BASED ON THE CHESTERFIELD COUNTY FIS.
  - PROPOSED FLOODPLAINS SHOWN ON THIS MAP ARE BASED ON THE PROPOSED CONDITIONS MODEL AND PROPOSED TOPOGRAPHY DATA SHOWN.

**ABBREVIATIONS:**  
 WSE = WATER SURFACE ELEVATION  
 BFE = BASE FLOOD ELEVATION  
 RS = RIVER STATION  
 100-YR FLOODPLAIN = 1% ANNUAL CHANCE RAINFALL EVENT FLOODPLAIN  
 500-YR FLOODPLAIN = 0.2% ANNUAL CHANCE RAINFALL EVENT FLOODPLAIN



**LEGEND**

- 100-YEAR FLOODPLAIN LIMITS (PROPOSED)
- 500-YEAR FLOODPLAIN LIMITS (PROPOSED)
- 100-YEAR FEMA MAPPED FLOODPLAIN LIMITS
- 500-YEAR FEMA MAPPED FLOODPLAIN LIMITS
- FLOODWAY (PROPOSED)
- FEMA MAPPED FLOODWAY
- FEMA CROSS SECTIONS (CHESTERFIELD)
- ADDED CROSS SECTIONS
- EXISTING TOPOGRAPHY (2-ft CONTOUR INTERVAL)
- PROPOSED TOPOGRAPHY (5-ft CONTOUR INTERVAL)
- PROPERTY LINE (HENRICO & CHESTERFIELD COUNTY GIS)
- STREAM CENTERLINE
- PROPOSED FILL AREA
- TOPOGRAPHIC DATA SOURCE BOUNDARY



L:\2024\43158-Kingslake-Crk-Hot-DWGS-Sheet\Enb\43158 - WORKMAP.dwg | Plotted on 4/19/2021 10:56 AM | by Iain Gordon



**APPENDIX 4**  
**ENDANGERED SPECIES ACT**  
**COMPLIANCE DOCUMENTATION**



## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
Phone: (804) 693-6694 Fax: (804) 693-9032  
<http://www.fws.gov/northeast/virginiafield/>

In Reply Refer To:

July 16, 2019

Consultation Code: 05E2VA00-2019-SLI-5263

Event Code: 05E2VA00-2019-E-12875

Project Name: Project Dry

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
  - USFWS National Wildlife Refuges and Fish Hatcheries
-

## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Virginia Ecological Services Field Office**

6669 Short Lane

Gloucester, VA 23061-4410

(804) 693-6694

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## Project Summary

Consultation Code: 05E2VA00-2019-SLI-5263

Event Code: 05E2VA00-2019-E-12875

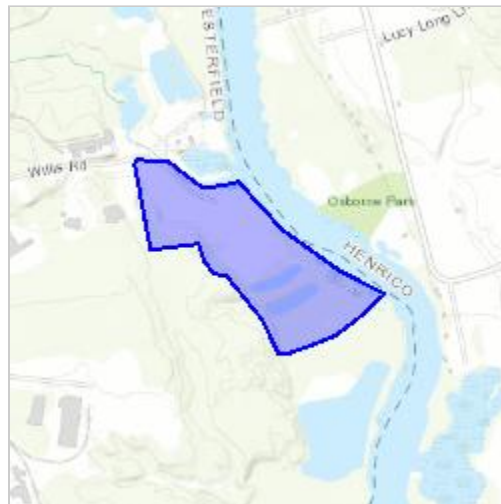
Project Name: Project Dry

Project Type: DEVELOPMENT

Project Description: Development

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/37.40007457642098N77.39326443906732W>



Counties: Chesterfield, VA | Henrico, VA

---

## Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

### Flowering Plants

NAME	STATUS
Sensitive Joint-vetch <i>Aeschynomene virginica</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/855">https://ecos.fws.gov/ecp/species/855</a>	Threatened

### Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

---

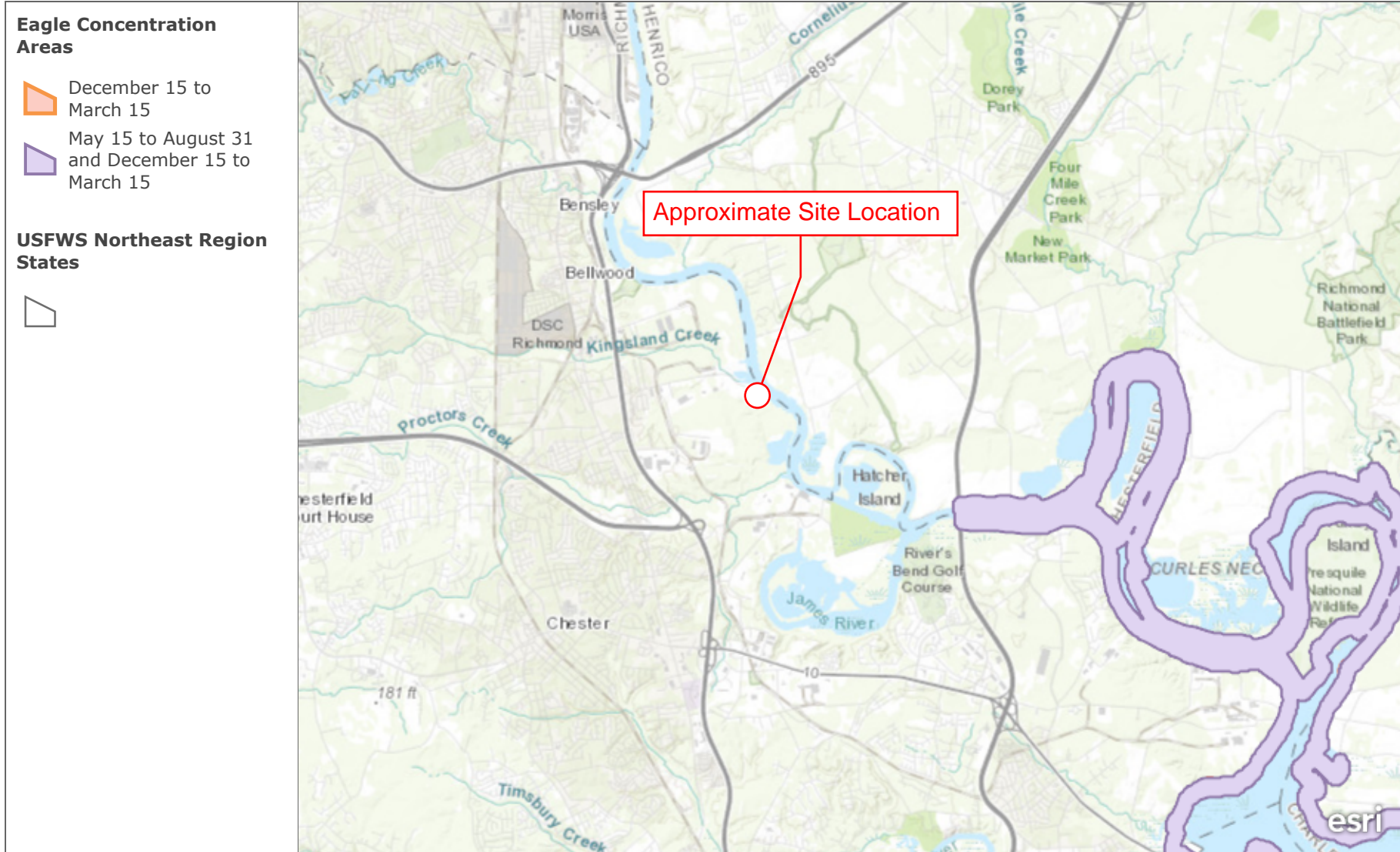
# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

---

# USFWS Bald Eagle Concentration Areas - Virginia



This map depicts designated Bald Eagle Concentration Areas in the State of Virginia. The Intent of this map is to provide information to the public about shoreline areas that ar ...

County of Henrico, VITA, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS





## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
Phone: (804) 693-6694 Fax: (804) 693-9032  
<http://www.fws.gov/northeast/virginiafield/>

IPaC Record Locator: 601-17452706

July 16, 2019

Subject: Consistency letter for the 'Project Dry' project indicating that any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Dear Timmons Group:

The U.S. Fish and Wildlife Service (Service) received on July 16, 2019 your effects determination for the 'Project Dry' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. You indicated that no Federal agencies are involved in funding or authorizing this Action. This IPaC key assists users in determining whether a non-Federal action may cause “take”<sup>[1]</sup> of the northern long-eared bat that is prohibited under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Please report to our office any changes to the information about the Action that you entered into IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation.

If your Action proceeds as described and no additional information about the Action’s effects on species protected under the ESA becomes available, no further coordination with the Service is required with respect to the northern long-eared bat.

The IPaC-assisted determination for the northern long-eared bat **does not** apply to the following ESA-protected species that also may occur in your Action area:

- Sensitive Joint-vetch, *Aeschynomene virginica* (Threatened)

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species listed above.

---

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

---

## Action Description

You provided to IPaC the following name and description for the subject Action.

### 1. Name

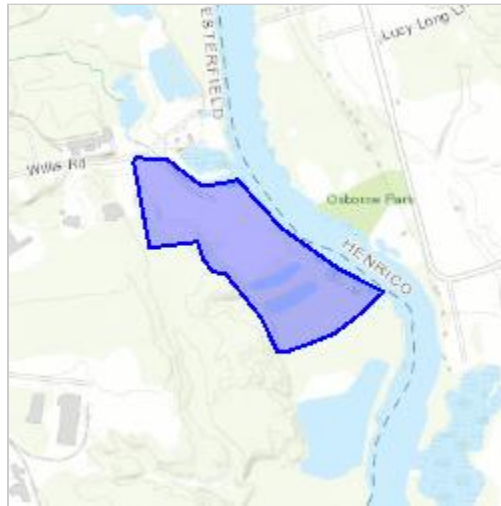
Project Dry

### 2. Description

The following description was provided for the project 'Project Dry':

Raising the project area elevation for commercial/industrial site development.

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/37.40007457642098N77.39326443906732W>



## Determination Key Result

This non-Federal Action may affect the northern long-eared bat; however, any take of this species that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o).

### Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on **May 15, 2017**. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for non-Federal actions is to assist determinations as to whether proposed actions are excepted from take prohibitions under the northern long-eared bat 4(d) rule.

---

If a non-Federal action may cause prohibited take of northern long-eared bats or other ESA-listed animal species, we recommend that you coordinate with the Service.

---

## Determination Key Result

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

## Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

*No*

2. Will your activity purposefully **Take** northern long-eared bats?

*No*

3. Is the project action area located wholly outside the White-nose Syndrome Zone?

**Automatically answered**

*No*

4. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases is available at [www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html](http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html).

*Yes*

5. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

*No*

6. Will the action involve Tree Removal?

*Yes*

7. Will the action only remove hazardous trees for the protection of human life or property?

*No*

---

8. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

*No*

9. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

*No*

---

## Project Questionnaire

**If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.**

1. Estimated total acres of forest conversion:

*90*

2. If known, estimated acres of forest conversion from April 1 to October 31

*90*

3. If known, estimated acres of forest conversion from June 1 to July 31

*90*

**If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.**

4. Estimated total acres of timber harvest

*90*

5. If known, estimated acres of timber harvest from April 1 to October 31

*90*

6. If known, estimated acres of timber harvest from June 1 to July 31

*90*

**If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.**

7. Estimated total acres of prescribed fire

*0*

8. If known, estimated acres of prescribed fire from April 1 to October 31

*0*

9. If known, estimated acres of prescribed fire from June 1 to July 31

*0*

**If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.**

---

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?  
*0*



**ATTACHMENT 2**  
**NOAA-GARFO DATABASE SEARCH DOCUMENTS**

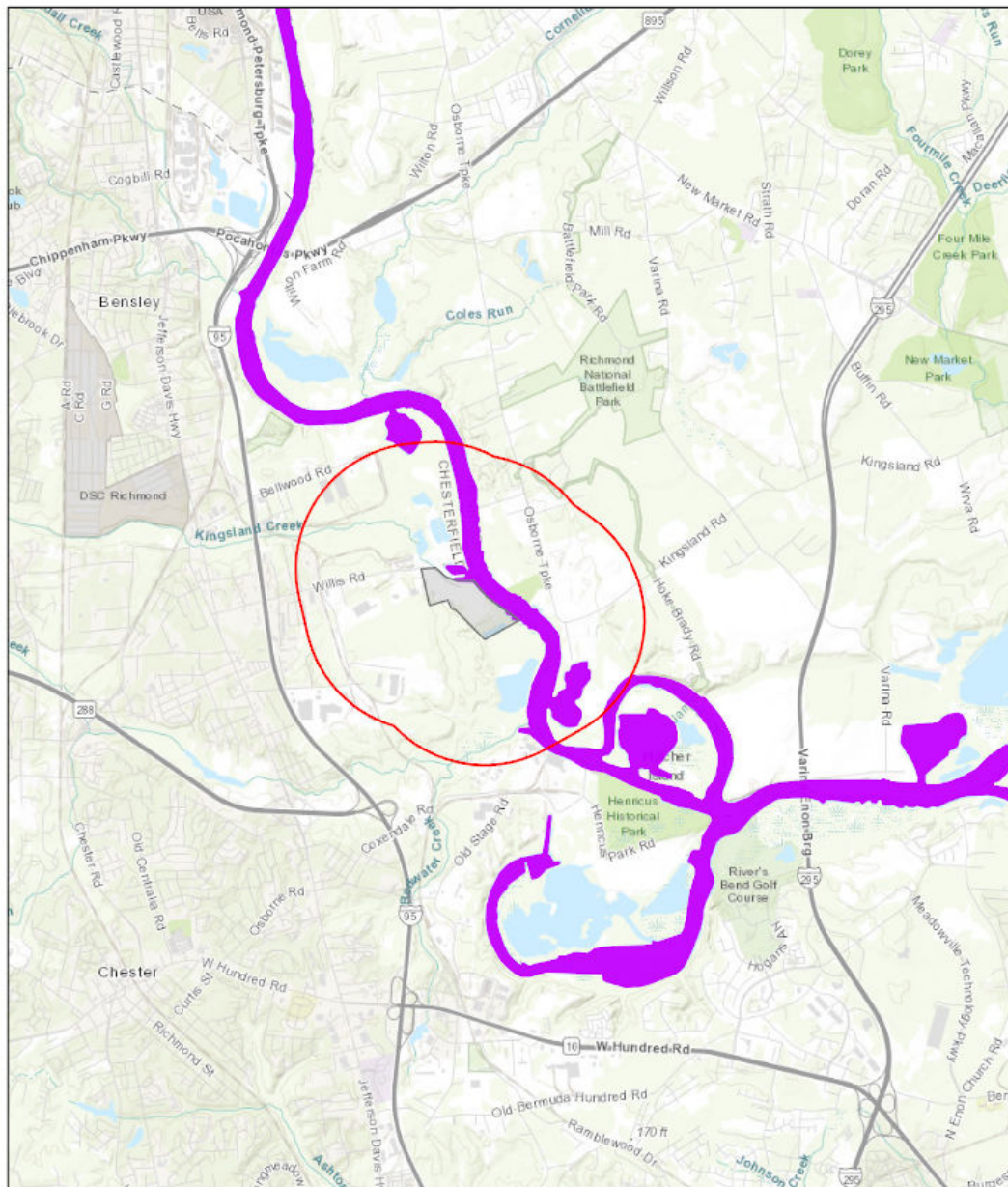


# Drawn Action Area & overlapping S7 Consultation Areas

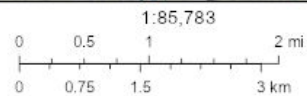
## Area of Interest (AOI) Information

Area : 3,460.02 acres

Jul 16 2019 10:01:16 Eastern Daylight Time



- Atlantic Sturgeon
- Shortnose Sturgeon
- Critical Habitat



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

## Summary

Name	Count	Area(acres)	Length(mi)
Atlantic Sturgeon	7	2,302.12	N/A
Shortnose Sturgeon	1	328.87	N/A
Atlantic Salmon	0	0	N/A
Sea Turtles	0	0	N/A
Atlantic Large Whales	0	0	N/A
In or Near Critical Habitat	1	264.79	N/A

## Atlantic Sturgeon

#	Feature ID	Species	Life Stage	Behavior	Zone
1	ANS_JAM_YOY_MAF	Atlantic sturgeon	Young of year	Migrating & Foraging	James River
2	ANS_JAM_PYL_MAF	Atlantic sturgeon	Post Yolk-sac Larvae	Migrating & Foraging	James River
3	ANS_JAM_SUB_MAF	Atlantic sturgeon	Subadult	Migrating & Foraging	James River
4	ANS_JAM_EYL_NON	Atlantic sturgeon	Eggs and Yolk-sac Larvae	N/A	James River
5	ANS_JAM_JUV_MAF	Atlantic sturgeon	Juvenile	Migrating & Foraging	James River
6	ANS_JAM_ADU_SPN	Atlantic sturgeon	Adult	Spawning	James River
7	ANS_JAM_ADU_MAF	Atlantic sturgeon	Adult	Migrating & Foraging	James River

#	From	Until	From (2)	Until (2)	Area(acres)
1	01/01	12/31	N/A	N/A	328.88
2	03/15	07/15	8/1	1/31	328.88
3	03/15	11/30	N/A	N/A	328.87
4	03/15	06/15	8/1	12/31	328.87
5	01/01	12/31	N/A	N/A	328.87
6	03/15	05/15	8/1	11/30	328.87
7	03/15	11/30	N/A	N/A	328.87

## Shortnose Sturgeon

#	Feature ID	Species	Life Stage	Behavior	Zone
1	SNS_JAM_ADU_MAF	Shortnose sturgeon	Adult	Migrating & Foraging	James River

#	From	Until	From (2)	Until (2)	Area(acres)
1	01/01	12/31	N/A	N/A	328.87

## In or Near Critical Habitat

#	Species	In or near Critical Habitat Unit	Area(acres)
1	Atlantic Sturgeon	Chesapeake Bay Unit 5: James River	264.79

DISCLAIMER: Use of this App does NOT replace the Endangered Species Act (ESA) Section 7 consultation process; it is a first step in determining if a proposed Federal action overlaps with listed species or critical habitat presence. Because the data provided through this App are updated regularly, reporting results must include the date they were generated. The report outputs (map/tables) depend on the options picked by the user, including the shape and size of the action area drawn, the layers marked as visible or selectable, and the buffer distance specified when using the "Draw your Action Area" function. Area calculations represent the size of overlap between the user-drawn Area of Interest (with buffer) and the specified S7 Consultation Area. Summary table areas represent the sum of these overlapping areas for each species group.

**ATTACHMENT 3**  
**VDGIF SEARCH DOCUMENTS AND MAPS**

**VaFWIS Initial Project Assessment Report** Compiled on 7/16/2019,[Help](#)

8:59:46 AM

Known or likely to occur within a **2 mile buffer around polygon; center 37.4050900 -77.4014399**  
 in **041 Chesterfield County, 087 Henrico County, VA**

[View Map of  
Site Location](#)

527 Known or Likely Species ordered by Status Concern for Conservation  
 (displaying first 23) (23 species with Status\* or Tier I\*\* or Tier II\*\* )

<a href="#">BOVA Code</a>	<a href="#">Status*</a>	<a href="#">Tier**</a>	<a href="#">Common Name</a>	<a href="#">Scientific Name</a>	<a href="#">Confirmed</a>	<a href="#">Database(s)</a>
060017	FESE	Ia	<a href="#">Spinymussel, James</a>	Parvaspina collina		BOVA
060003	FESE	Ia	<a href="#">Wedgemussel, dwarf</a>	Alasmidonta heterodon		BOVA
010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>	BOVA,TEWaters
050022	FTST	Ia	<a href="#">Bat, northern long-eared</a>	Myotis septentrionalis		BOVA
060029	FT	IIa	<a href="#">Lance, yellow</a>	Elliptio lanceolata		BOVA
050020	SE	Ia	<a href="#">Bat, little brown</a>	Myotis lucifugus		BOVA
050027	SE	Ia	<a href="#">Bat, tri-colored</a>	Perimyotis subflavus	<a href="#">Yes</a>	BOVA,SppObs
040096	ST	Ia	<a href="#">Falcon, peregrine</a>	Falco peregrinus		BOVA
040293	ST	Ia	<a href="#">Shrike, loggerhead</a>	Lanius ludovicianus		BOVA
060173	FPST	Ia	<a href="#">Pigtoe, Atlantic</a>	Fusconaia masoni		BOVA
020002	ST	IIa	<a href="#">Treefrog, barking</a>	Hyla gratiosa		BOVA
040292	ST		<a href="#">Shrike, migrant loggerhead</a>	Lanius ludovicianus migrans		BOVA
030063	CC	IIIa	<a href="#">Turtle, spotted</a>	Clemmys guttata		BOVA
010077		Ia	<a href="#">Shiner, bridle</a>	Notropis bifrenatus		BOVA
040092		Ia	<a href="#">Eagle, golden</a>	Aquila chrysaetos		BOVA
060084		Ib	<a href="#">Pigtoe, Virginia</a>	Lexingtonia subplana		BOVA
040213		Ic	<a href="#">Owl, northern saw-whet</a>	Aegolius acadicus	<a href="#">Yes</a>	BOVA,SppObs
040052		IIa	<a href="#">Duck, American black</a>	Anas rubripes		BOVA
040029		IIa	<a href="#">Heron, little blue</a>	Egretta caerulea caerulea		BOVA
040036		IIa	<a href="#">Night-heron, yellow-crowned</a>	Nyctanassa violacea violacea		BOVA
040320		IIa	<a href="#">Warbler, cerulean</a>	Setophaga cerulea		BOVA
040140		IIa	<a href="#">Woodcock, American</a>	Scolopax minor		BOVA
040105		IIb	<a href="#">Rail, king</a>	Rallus elegans		BOVA,Habitat

To view **All 527 species** [View 527](#)

\*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

\*\*I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Virginia Wildlife Action Plan Conservation Opportunity Ranking:

a - On the ground management strategies/actions exist and can be feasibly implemented.;

b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;

c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

[View Map of All Query Results from All Observation Tables](#)

Bat Colonies or Hibernacula: **Not Known**

**Anadromous Fish Use Streams** (1 records)

[View Map of All Anadromous Fish Use Streams](#)

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE*	Highest Tier**	
C92	<a href="#">James River 1</a>	Confirmed	6		IV	<a href="#">Yes</a>

**Impediments to Fish Passage** (3 records)

[View Map of All Fish Impediments](#)

ID	Name	River	View Map
1040	<a href="#">CHESTERFIELD POWER STATION</a>	TR-JAMES RIVER	<a href="#">Yes</a>
1302	<a href="#">I-95</a>	PROCTORS CREEK	<a href="#">Yes</a>
807	<a href="#">PRIVATE ROAD CULVERT</a>	KINGSLAND CREEK	<a href="#">Yes</a>

**Colonial Water Bird Survey** (5 records)

[View Map of All Query Results Colonial Water Bird Survey.](#)

Colony_Name	N Obs	Latest Date	N Species			View Map
			Different Species	Highest TE*	Highest Tier**	
<a href="#">Western Shore, Drewrys Bluff, Chesterfield</a>	2	May 4 2013	1			<a href="#">Yes</a>
<a href="#">Western Shore, Drewrys Bluff, Henrico</a>	1	May 4 2013	1			<a href="#">Yes</a>
<a href="#">Cornelius Creek</a>	1	Apr 28 2003	1			<a href="#">Yes</a>
<a href="#">Henricus</a>	1	Apr 28 2003	1			<a href="#">Yes</a>
<a href="#">Aiken Swamp/Dutch Gap Cut</a>	1	Jun 1 1993	1			<a href="#">Yes</a>

Displayed 5 Colonial Water Bird Survey

## Threatened and Endangered Waters ( 12 Reaches )

[View Map of All Threatened and Endangered Waters](#)

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
<a href="#">James River (0159825.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0161402.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0163242.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0163551.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0163753.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0167412.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0167586.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0171573.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0174220.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0179857.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0182777.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0185318.)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>

### Managed Trout Streams

N/A

### Bald Eagle Concentration Areas and Roosts

N/A

### Bald Eagle Nests ( 4 records )

[View Map of All Query Results](#)  
[Bald Eagle Nests](#)

Nest	N Obs	Latest Date	DGIF Nest Status	View Map
<a href="#">CD1103</a>	2	Apr 18 2011	Unknown	<a href="#">Yes</a>
<a href="#">HE0801</a>	8	Apr 18 2011	Unknown	<a href="#">Yes</a>
<a href="#">HE9701</a>	11	Apr 24 2000	HISTORIC	<a href="#">Yes</a>
<a href="#">HE9902</a>	22	Apr 18 2011	Unknown	<a href="#">Yes</a>

Displayed 4 Bald Eagle Nests

### Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

### Habitat Predicted for Terrestrial WAP Tier I & II Species

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
040105		Iib	<a href="#">Rail, king.</a>	Rallus elegans	<a href="#">Yes</a>

### Public Holdings: ( 1 names )

Name	Agency	Level
Richmond National Battlefield Park	National Park Service	Federal

Compiled on 7/16/2019, 8:59:46 AM 1983875.0 report=IPA searchType= P dist= 3218 poi= 37.4050900 -77.4014399 siteDD= 37.4050957 -77.4014500;37.4049861 -77.3993380;37.4037279 -77.3972280;37.4037457 -77.3959926;37.4039903 -77.3947510;37.4015272 -77.3919613;37.3994606 -77.3883109;37.3981348 -77.3852463;37.3968927 -77.3870339;37.3960489 -77.3885764;37.3955835 -77.3898025;37.3950675 -77.3917227;37.3950533 -77.3922488;37.3968173 -77.3932270;37.3982418 -77.3946166;37.3991659 -77.3955355;37.3991932 -77.3964197;37.3998477 -77.3970556;37.4007853 -77.3973766;37.4004139 -77.4005141;37.4049633 -77.4015714;37.4050957 -77.4014500;

PixelSize=64; Anadromous=0.074979; BECAR=0.033536; Bats=0.026765; Buffer=0.137209; County=0.116247; Impediments=0.054163; Init=0.210579; PublicLands=0.057884; SppObs=2.252613; TEWaters=0.090355; TierReaches=0.049307; TierTerrestrial=0.099505; Total=3.3182; Tracking\_BOVA=0.162565; Trout=0.058898





Site Location

37.40509 -77.40143 is the Search Point

[back](#)
Pan
M
In
Zoom
Out
Small
Size
Blg
[Help](#)

Show Position Rings

Yes  No  
1 mile and 1/4 mile at the Search Point

Show Search Area

Yes  No  
2 Search distance miles buffer

Display Search Point is at center not at map center

Base Map Choices

BW Aerial Photography

Map Overlay Choices

Current List: Search, BECAR, BAEANests, TEWaters, TierII, Habitat, Trout, Anadromous

Map Overlay Legend

T & E Waters

- Federal
- State

Predicted Habitat WAP Tier I & II

- Aquatic
- Terrestrial

Trout Waters

- Class I - IV
- Class V - VI

Anadromous Fish Reach

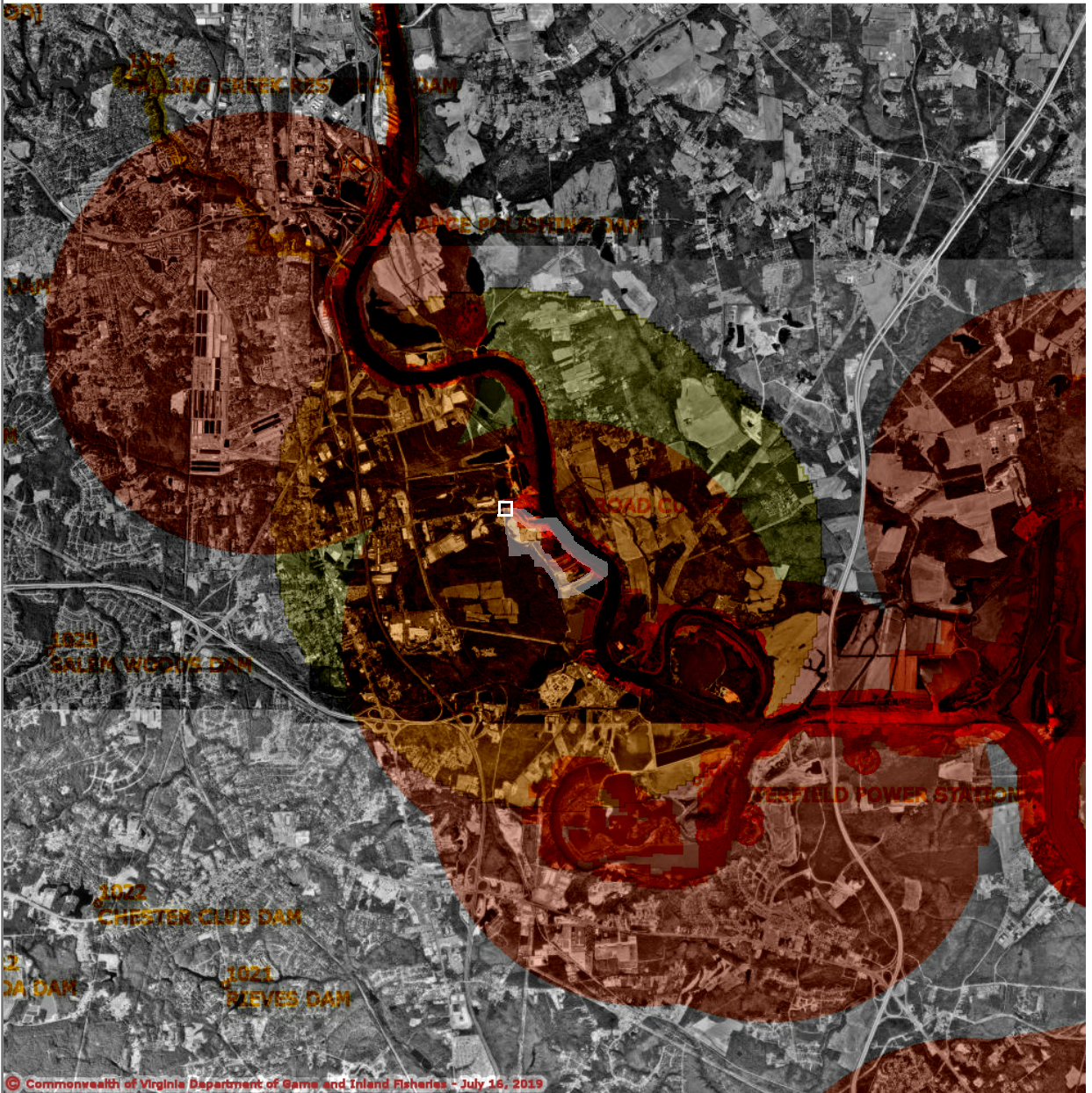
- Confirmed
- Potential

Impediment

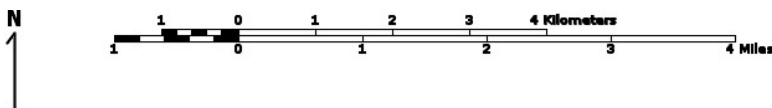
- 2 mile radius Search Area

Bald Eagle Concentration Areas and Roosts

- Bald Eagle nests 660 and 330 foot management zones
- Data Observation Site



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Point of Search 37.40509 -77.40143  
Map Location 37.39996 -77.39347

- Select Coordinate System:
- Degrees, Minutes, Seconds Latitude - Longitude
  - Decimal Degrees Latitude - Longitude
  - Meters UTM NAD83 East North Zone
  - Meters UTM NAD27 East North Zone

Base Map source: Black & White USGS Aerial Photography (see [Microsoft terraserver-usa.com](http://Microsoft.terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 280144 and top 4149932. Pixel size is 16 meters. Coordinates displayed are decimal Degrees North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixels. The map display represents 16000 meters east to west by 16000 meters north to south for a total of 256.0 square kilometers. The map display represents 52502 feet east to west by 52502 feet north to south for a total of 98.8 square miles.



# Virginia Department of Game and Inland Fisheries

7/16/2019 9:03:28 AM

## Fish and Wildlife Information Service

**VaFWIS Search Report** Compiled on 7/16/2019, 9:03:28 AM

[Help](#)

Known or likely to occur within a **2 mile buffer around polygon; center 37.4050900  
-77.4014399**  
in **041 Chesterfield County, 087 Henrico County, VA**  
where (010032) [Sturgeon, Atlantic](#) observed.

[View Map of  
Site Location](#)

### Threatened and Endangered Waters where Sturgeon, Atlantic (010032) observed

( 12 Reaches )

[View Map of All  
Threatened and Endangered Waters](#)

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
<a href="#">James River (0159825)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0161402)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0163242)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0163551)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0163753)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0167412)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0167586)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0171573)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0174220)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River (0179857)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>
<a href="#">James River</a>	FESE						<a href="#">Yes</a>

<a href="#">(0182777)</a>		010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	
<a href="#">James River (0185318)</a>	FESE	010032	FESE	Ib	<a href="#">Sturgeon, Atlantic</a>	Acipenser oxyrinchus	<a href="#">Yes</a>

\*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed;  
FC=Federal Candidate; CC=Collection Concern

\*\*I=VA Wildlife Action Plan - Tier I - Critical Conservation Need;

II=VA Wildlife Action Plan - Tier II - Very High Conservation Need;

III=VA Wildlife Action Plan - Tier III - High Conservation Need;

IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Virginia Wildlife Action Plan Conservation Opportunity Ranking:

a - On the ground management strategies/actions exist and can be feasibly implemented.;

b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;

c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

Compiled on 7/16/2019, 9:03:28 AM 1983875.1 report=BOVA searchType=P dist= 3218 poi= 37.4050900 -77.4014399

**audit no. 983875 7/16/2019 9:03:28 AM Virginia Fish and Wildlife Information Service**  
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**Threatened and Endangered Waters where Sturgeon, Atlantic (010032) observed**

37.40509 -77.40143 is the Search Point

**Show Position Rings**

Yes  No  
1 mile and 1/4 mile at the Search Point

**Show Search Area**

Yes  No  
2 Search distance miles buffer

Display Search Point is at center not at map center

**Base Map Choices**

BW Aerial Photography

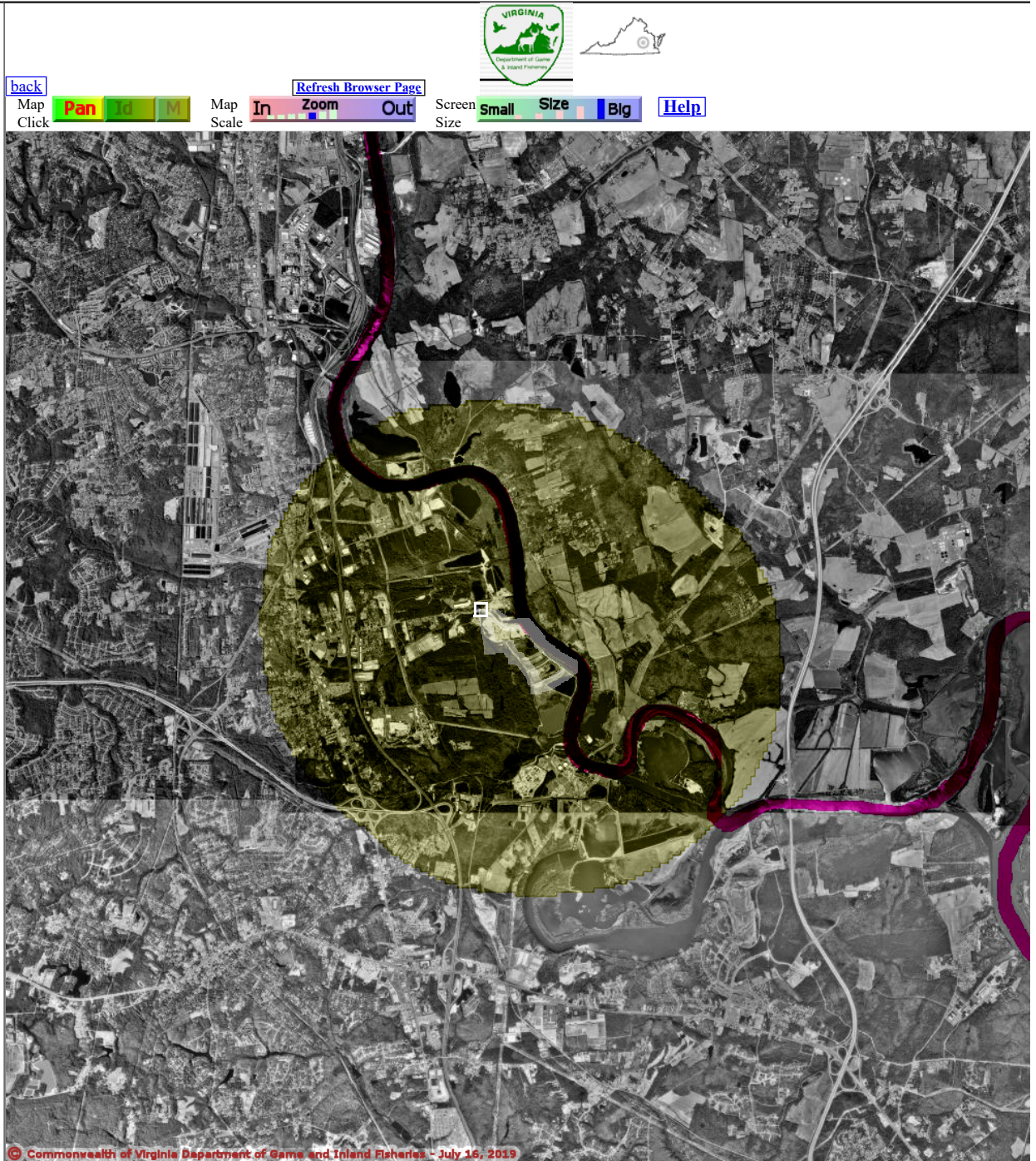
**Map Overlay Choices**

Current List: Search, TEWaters

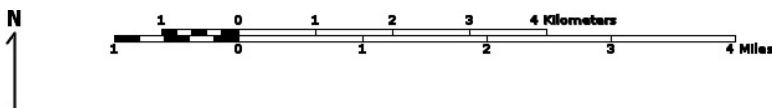
**Map Overlay Legend**

**T & E Waters**

- Federal
- State



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Point of Search 37.40509 -77.40143  
Map Location 37.39996 -77.39347

- Select **Coordinate System**:
- Degrees, Minutes, Seconds Latitude - Longitude
  - Decimal Degrees Latitude - Longitude
  - Meters UTM NAD83 East North Zone
  - Meters UTM NAD27 East North Zone

Base Map source: Black & White USGS Aerial Photography (see [Microsoft terraserver-usa.com](http://Microsoft.terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 280144 and top 4149932. Pixel size is 16 meters. Coordinates displayed are decimal Degrees North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixels. The map display represents 16000 meters east to west by 16000 meters north to south for a total of 256.0 square kilometers. The map display represents 52502 feet east to west by 52502 feet north to south for a total of 98.8 square miles.



# Virginia Department of Game and Inland Fisheries

7/16/2019 9:06:14 AM

## Fish and Wildlife Information Service

**VaFWIS Search Report** Compiled on 7/16/2019, 9:06:14 AM

[Help](#)

Known or likely to occur within a **2 mile buffer around polygon; center 37.4050900 -77.4014399**  
 in **041 Chesterfield County, 087 Henrico County, VA**  
 where (050027) [Bat, tri-colored](#) observed.

[View Map of Site Location](#)

### Threatened and Endangered Waters where Bat, tri-colored (050027) observed

N/A

### Species Observations where Bat, tri-colored (050027) observed ( 2 records , 2 Observations with Threatened or Endangered species )

[View Map of All Query Results](#)  
[Species Observations where Bat, tri-colored \(050027\) observed](#)

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
<a href="#">625508</a>	SppObs	Jun 30 2015	Cynthia Hauser	2	SE	I	<a href="#">Yes</a>
<a href="#">628383</a>	SppObs	Jun 30 2015	Cynthia Hauser	2	SE	I	<a href="#">Yes</a>

Displayed 2 Species Observations where Bat, tri-colored (050027) observed

\*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

\*\*I=VA Wildlife Action Plan - Tier I - Critical Conservation Need;  
 II=VA Wildlife Action Plan - Tier II - Very High Conservation Need;  
 III=VA Wildlife Action Plan - Tier III - High Conservation Need;  
 IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need  
 Virginia Wildlife Action Plan Conservation Opportunity Ranking:  
 a - On the ground management strategies/actions exist and can be feasibly implemented.;  
 b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;  
 c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

Compiled on 7/16/2019, 9:06:14 AM 1983875.1 report=BOVA searchType=P dist= 3218 poi= 37.4050900 -77.4014399

audit no. 983875 7/16/2019 9:06:14 AM Virginia Fish and Wildlife Information Service  
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2 Species Observations where Bat, tri-colored (050027) observed

37.40509 -77.40143 is the Search Point

[back](#) [Refresh Browser Page](#)  
 Map Click **Pan** **Zoom** **Out** Map Scale **In** **Zoom** **Out** Screen Size **Small** **Size** **Blg** [Help](#)

Show Position Rings

Yes  No  
1 mile and 1/4 mile at the Search Point

Show Search Area

Yes  No  
2 Search distance miles buffer

Display at center	Search Point is not at map center
-------------------	-----------------------------------

Base Map [Choices](#)

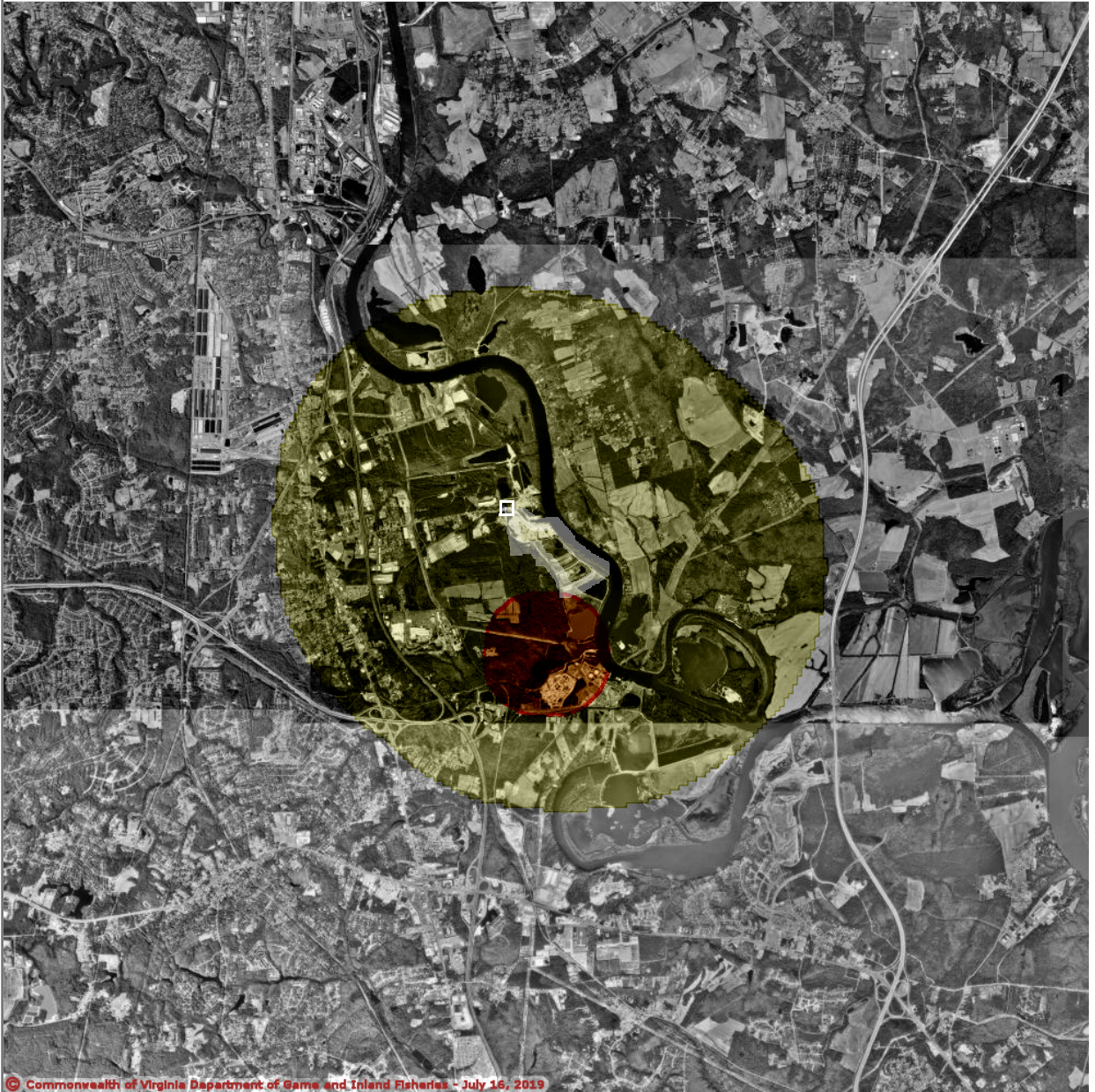
BW Aerial Photography

Map Overlay [Choices](#)

Current List: Search, SppObs

Map Overlay Legend

- 2 mile radius Search Area
- Data Observation Site



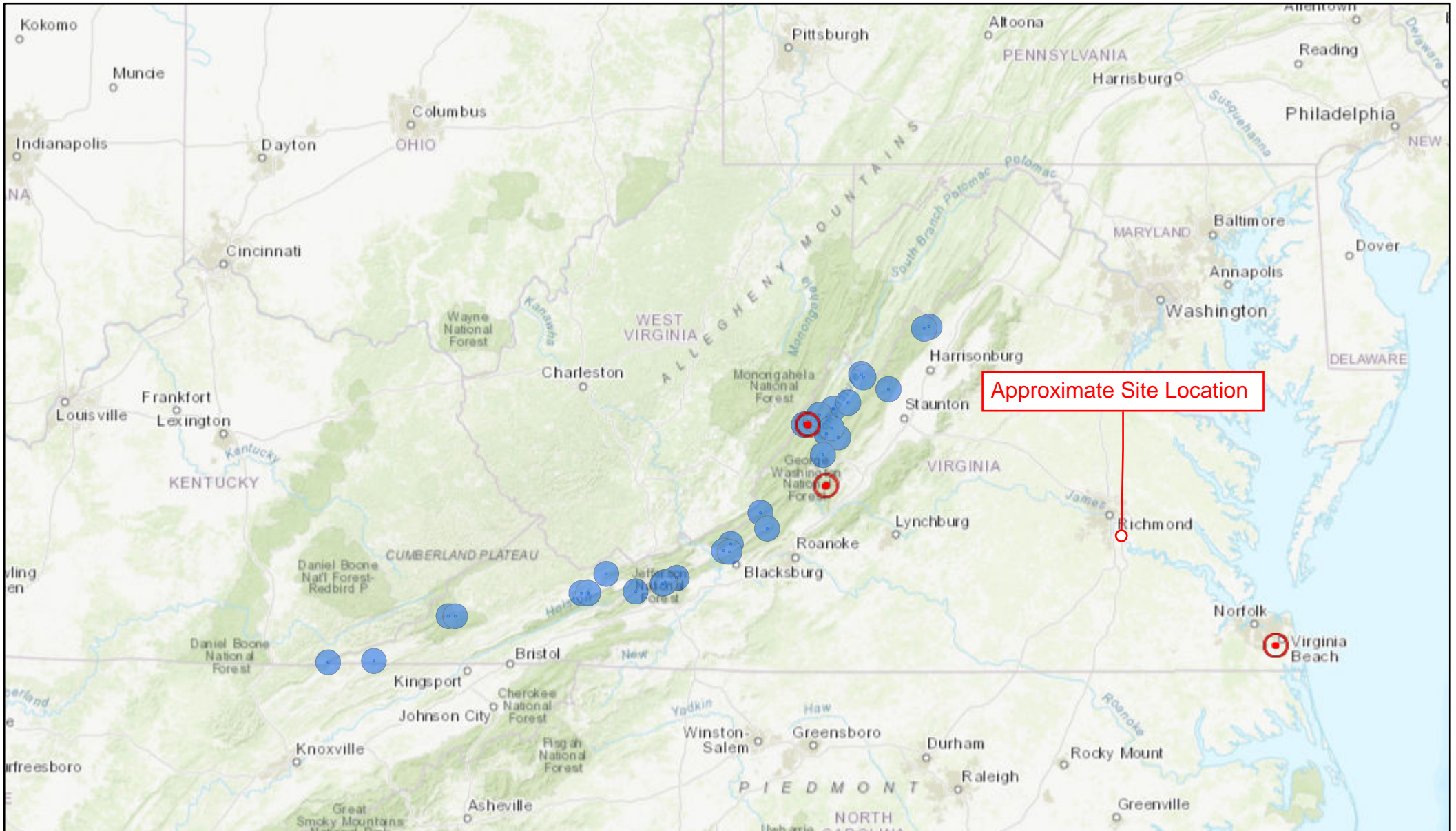
Point of Search 37.40509 -77.40143  
Map Location 37.39996 -77.39347

- Select **Coordinate System**:
- Degrees,Minutes,Seconds Latitude - Longitude
  - Decimal Degrees Latitude - Longitude
  - Meters UTM NAD83 East North Zone
  - Meters UTM NAD27 East North Zone

Base Map source: Black & White USGS Aerial Photography (see [Microsoft terraserver-usa.com](http://Microsoft.terraserver-usa.com) for details)

Map projection is UTM Zone 18 NAD 1983 with left 280144 and top 4149932. Pixel size is 13. . Coordinates displayed are decimal Degrees North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixels. The map display represents 16000 meters east to west by 16000 meters north to south for a total of 256.0 square kilometers. The map display represents 52502 feet east to west by 52502 feet north to south for a total of 98.8 square miles.

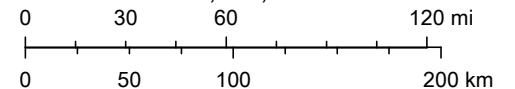
# NLEB Locations and Roost Trees



7/16/2019, 10:14:31 AM

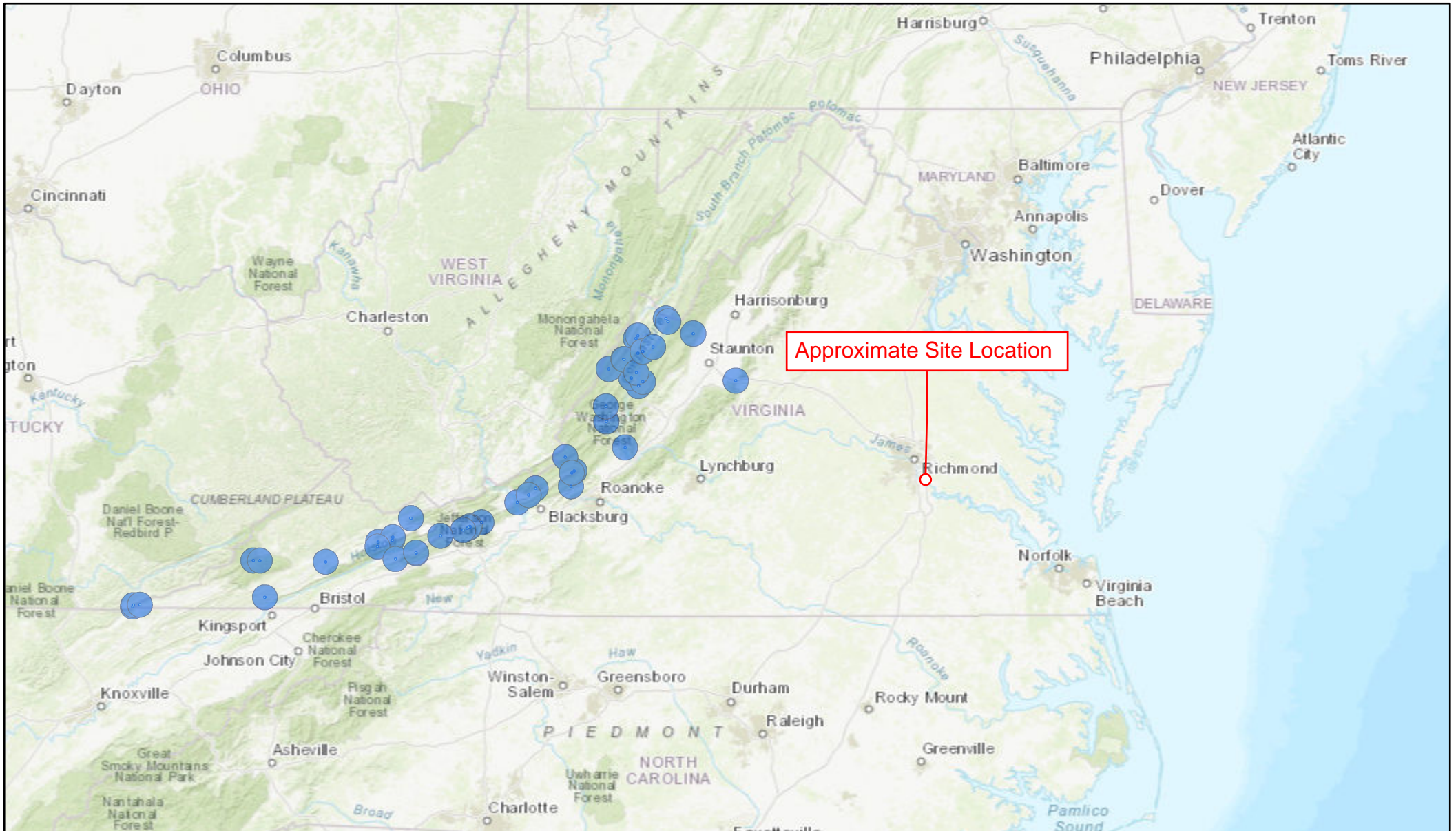
- NLEB Known Occupied Maternity Roost (Summer Habitat)
- NLEB Hibernaculum 5.5 Mile Buffer
- NLEB Hibernaculum Half Mile Buffer

1:4,622,324



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

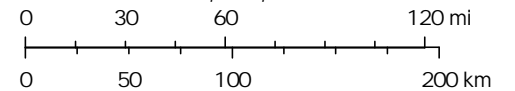
# Tricolored Bat and Little Brown Bat Hibernacula



7/16/2019, 10:14:53 AM

- Tri-colored and Little Brown Hibernaculum Half Mile Buffer
- Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:4,622,324



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



**ATTACHMENT 4**  
**DCR-DNH DATABASE SEARCH DOCUMENTS**

## Natural Heritage Resources

### Your Criteria

Taxonomic Group: Select All

Global Conservation Status Rank: Select All

State Conservation Status Rank: Select All

Federal Legal Status: Select All

State Legal Status: Select All

Watershed (8 digit HUC): 02080206 - Lower James River

Subwatershed (12 digit HUC): JL03 - James River-Proctors Creek

Search Run: 7/16/2019 9:53:42 AM

### Result Summary

Total Species returned: 1

Total Communities returned: 0

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Community	Scientific Name	Scientific Name Linked	<a href="#">Global Conservation Status Rank</a>	<a href="#">State Conservation Status Rank</a>	<a href="#">Federal Legal Status</a>	<a href="#">State Legal Status</a>	Statewide Occurrences	Virginia Coastal Zone
<b>Lower James</b>								
James River-Proctors Creek								
VASCULAR PLANTS								
Swamp-pink	Helonias bullata	<a href="#">Helonias bullata</a>	G3	S2S3	LT	LE	39	Y

**Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.**

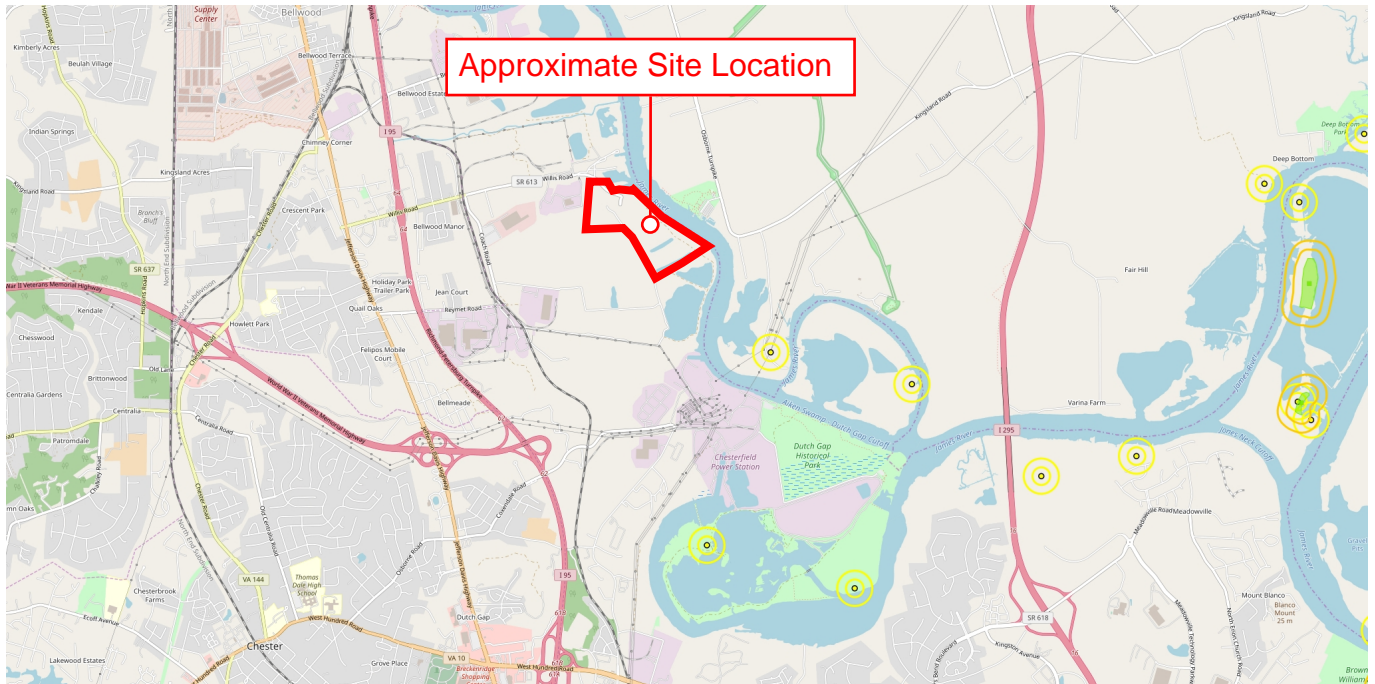
**For Additional Information** on locations of Natural Heritage Resources please submit an [information request](#).

**To Contribute information** on locations of natural heritage resources, please fill out and submit a [rare species sighting form](#).

**ATTACHMENT 5  
CCB EAGLES NEST LOCATOR MAP**



# CCB Mapping Portal



**Layers:** VA Eagle Nest Locator, VA Eagle Nest Buffers, Eagle Roosts, Eagle Roost Polygons, Eagle Roost Buffers

**Map Center [longitude, latitude]:** [-77.38756656646729, 37.3960392844092]

**Map Link:**

[https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&layer=VA+Eagle+Nest+Buffers&layer=Eagle+Roosts&layer=Eagle+Roost+Polygons&layer=Eagle+Roost+Buffers&zoom=14&lat=37.3960392844092&lng=-77.38756656646729&legend=legend\\_tab\\_4ca7337c-c07d-11e5-93bc-0ecfd53eb7d3&base=Street+Map+%28OSM%29](https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&layer=VA+Eagle+Nest+Buffers&layer=Eagle+Roosts&layer=Eagle+Roost+Polygons&layer=Eagle+Roost+Buffers&zoom=14&lat=37.3960392844092&lng=-77.38756656646729&legend=legend_tab_4ca7337c-c07d-11e5-93bc-0ecfd53eb7d3&base=Street+Map+%28OSM%29)

**Report Generated On:** 07/16/2019

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Report generated by [The Center for Conservation Biology Mapping Portal](#).

To learn more about CCB visit [ccbbirds.org](http://ccbbirds.org) or contact us at [info@ccbbirds.org](mailto:info@ccbbirds.org)