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Natural Resource Stewardship and Science

Wadeable Stream Suitability Assessment for Long-Term Monitoring

Chattahoochee River National Recreation Area

Natural Resource Data Series NPS/SECN/NRDS—2018/1186



ON THE COVER
Haw Creek, which runs through the Bowman Island management unit of the Chattahoochee River National Recreation Area. NPS photo / SECN

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Natural Resource Data Series NPS/SECN/NRDS—2018/1186

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October 2018
U. S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science
Fort Collins, Colorado

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Please cite this publication as:

McDonald, J. M. and E. N. Starkey. 2018. Wadeable stream suitability assessment for long-term monitoring: Chattahoochee River National Recreation Area. Natural Resource Data Series NPS/SECN/NRDS—2018/1186. National Park Service, Fort Collins, Colorado.

NPS 36/149005, October 2018

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Executive Summary

The Southeast Coast Network (SECN) initiated a monitoring effort to assess habitat conditions in wadeable streams at national parks, recreation areas, battlefields, and monuments in Alabama, Georgia, and South Carolina (McDonald et al. 2018a). These parks include Chattahoochee River National Recreation Area, Kennesaw Mountain National Battlefield Park, Congaree National Park, Horseshoe Bend National Military Park, and Ocmulgee National Monument.

The monitoring was implemented in 2016, and focuses specifically on providing relevant data to assess the physical condition of Piedmont and Upper Coastal Plain streams with respect to aquatic and riparian habitats and how these habitats may be changing over time. The habitat assessment methods outlined in the protocol rely on standard data collection methods and standard operating procedures currently in use by the U.S. Geological Survey (USGS), U.S. Environmental Protection Agency (EPA), and U.S. Forest Service (USFS) that have been modified to better meet the needs of National Park Service (NPS) managers.

Monitoring Wadeable Stream Habitat Conditions in Southeast Coast Network Parks: Protocol Narrative (McDonald et al. 2018a) was developed to begin a monitoring program that will provide insight into the status of, and trends in, stream and riparian habitat conditions. The number of reaches surveyed at each park is dependent on the spatial extent of the park and the total number of wadeable streams that are present within park boundaries. Regardless of the size of the park and the number of reaches that are to be monitored, selected reaches (1) are representative of the processes influencing the streams in each park; (2) can address current and anticipated management concerns, and (3) offer the most utility for future complementary studies.

The purpose of this report is to document the stream suitability survey that was conducted at Chattahoochee River NRA to determine which streams should be chosen for long-term monitoring. During March 2017, a total of thirty-three stream segments at the park were assessed to determine their suitability for long-term monitoring. Stream segment suitability was based on whether the stream: (1) could be safely accessed; (2) is part of a single channel, wadeable stream system and; (3) is not greatly influenced by upstream impoundments. Of the thirty-three stream segments, fourteen were determined to be suitable for long-term monitoring, five were classified as potentially suitable (classified as maybe), and fourteen were determined to not be suitable for long-term monitoring using the methods outlined in McDonald et al. (2018a).

The streams that were chosen for long-term monitoring were selected to provide comparisons between similar streams and/or to be representative of similar streams within the park. The following report provides an overview of the methods that were used to assess the suitability of each stream segment, describes each one of the streams that was assessed including a map showing how to access each stream (Appendix A), and provides an overview of how the monitored reaches within each stream segment will be compared in future reports.

Introduction

The purpose of this report is to document the stream suitability survey that was conducted at Chattahoochee River National Recreation Area (Chattahoochee River NRA) to determine which streams should be chosen for long-term monitoring (McDonald et al. 2018a). During March 2017, a total of 33 stream segments at Chattahoochee National Recreation Area were assessed to determine their suitability for long-term monitoring (Table 1 and Figure 1). Stream segment suitability was based on whether the stream: (1) could be safely accessed; (2) is part of a single channel, wadeable stream system and; (3) is not greatly influenced by upstream impoundments.

Of the 33 stream segments, 14 were determined to be suitable for long-term monitoring, five were classified as potentially suitable (classified as maybe), and 14 were determined to not be suitable for long-term monitoring (Table 1).

Eight distinct stream types were identified in the field:

1. Small–Headwater (n = 6);
2. Medium–Low Entrenchment (n = 9);
3. Medium–High Entrenchment (n = 4);
4. Large–Low Entrenchment (n = 6);
5. Extremely Entrenched (n = 2);
6. Low Gradient–Multi-Channel (n = 1);
7. Bedrock Constrained (n = 1); and
8. Nonwadeable (n = 3).

The extremely entrenched streams were determined not to be suitable for monitoring because of safety issues associated with accessing these streams. Additionally, the low gradient–multi-channel, bedrock constrained, and nonwadeable streams were excluded because the SECN wadeable stream monitoring protocol was not developed to monitor these types of streams (McDonald et al. 2018a).

Following an analysis of the basin characteristics of the potentially suitable segments (Table 2), at least one stream from the four remaining stream types (Small – Headwater [n = 5], Medium – Low Entrenchment [n = 6], Medium – High Entrenchment [n = 1], and Large – Low Entrenchment [n = 2]) was chosen for monitoring (Table 3). The 14 streams that were chosen for long-term monitoring were chosen to provide comparisons between similar streams or to be representative of similar streams within the park. The following report provides an overview of the methods that were used to assess the suitability of each stream segment, describes each one of the streams that was assessed including a map showing how to access each stream (Appendix A), and provides an overview of how the monitored reaches within each stream segment will be compared in future reports.

Note that throughout this report, stream names in quotations are not the official name of the stream.

Chattahoochee River National Recreation Area

The Chattahoochee River NRA is made up of 6,800 acres (2,752 hectares [ha]) of mixed pine/hardwood forests and wetlands that buffer 48 miles (77.2 kilometers [km]) of the Chattahoochee River (Figure 1). The park consists of 16 non-contiguous management units along this stretch of the river as it flows through north Atlanta, Georgia, the Southeast's largest metropolitan area (U.S. Census Bureau 2010). The park offers green space and water-based recreational opportunities for the Atlanta metropolitan area and was designated as America's first official National Water Trail in 2012. This section of the Chattahoochee River is highly regulated by flows from Buford Dam, which was completed in 1957, and is heavily utilized for power generation, water supplies and waste-water assimilation for the greater metropolitan Atlanta area.

The Upper Chattahoochee River's position in a relatively stable fault zone has resulted in a long and narrow watershed (Burkholder et al. 2010) that is dominated by many small tributaries feeding the mainstream along most of the park-authorized area. Flow alteration associated with the impoundment and release of water for power generation has a pronounced effect on the flow patterns of the main stem. The majority of the streams flowing through the Chattahoochee River NRA management units are small, lower-order (first to third order) tributaries that are heavily impacted by the direct and indirect effects of urbanization. Changes in the watersheds outside and upstream of the park have led to higher peak flows and lower base flow in the tributaries (Gregory et al. 2012; Starkey 2015). Storm water discharges from the urban areas that feed into these tributaries also impact the quality of the water supplied by these small streams by increasing the temperature, turbidity, and bacterial and heavy metal loads. Stream habitat and water quality are also influenced by highways and roads, power line rights-of way, and sewer lines that commonly cross both the wadeable and non-wadeable streams in the park. Within the park, stream bank conditions are impacted by bicycle and foot trails. Additionally, altered stormflow regimes potentially threaten park infrastructure (e.g., parking lots, bridges) due to increased channel instability.

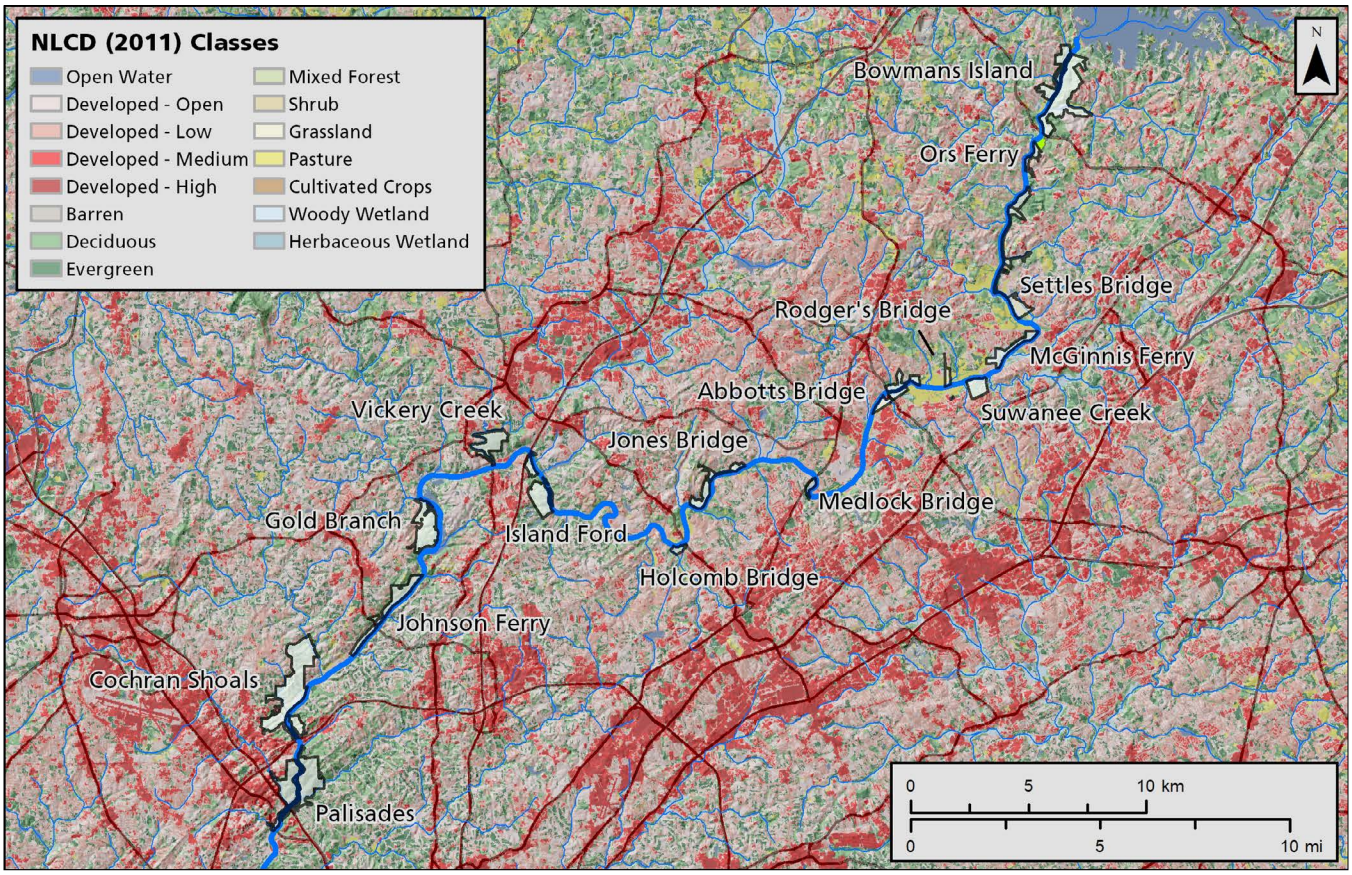


Figure 1. Overview map of the 16 park units at Chattahoochee National Recreation Area. Land cover data are from the National Land Cover Database (Homer et al. 2015).

Methods and Results

Stream segments were chosen for long-term monitoring based on GIS analyses of relevant, reliable, and accurate data layers, their relevance to management concerns, and based on field assessments of their safety and accessibility. Field evaluations are necessary because the resolution of available geospatial data is often too imprecise for a determination of the suitability of any potential sample reach. In order to provide the most relevant information for management, stream reaches are either: (1) paired (based on drainage area and stream type) to determine the influence of different upstream watershed characteristics and land use/land cover; or (2) chosen to represent conditions/processes affecting similar-sized streams within the park. A probabilistic approach to reach selection was not used due to the limited number of stream segments within the park.

Stream segments were selected for long-term monitoring in five stages:

1. identification of potential stream segments in GIS;
2. consultation with park staff;
3. field suitability evaluation;
4. basin-scale assessment in GIS; and
5. final decision (with park staff input).

Each of these stages is discussed in detail in McDonald et al. (2018a) and step-by-step instructions are provided in SOP 1.2.14 *Wadeable Stream Reach Selection and Location of Sampling Points—Version 1.0* (McDonald et al. 2018b). A brief description of each stage and the results of the each analysis is provided below.

Identification of Potential Stream Segments in GIS

Potential stream segments were identified in a GIS using the National Hydrography Dataset high definition (NHDhd) dataset and the park ownership boundaries. A point coverage was created to represent the potential stream segments within the park. This point coverage was used to discuss potential survey reaches with park staff as well as locate the stream segments in the field. All stream segments were classified as perennial, were within park ownership boundaries, and each segment was at least 400 feet (122 meters [m]) in length. A total of 36 perennial stream segments were identified within or on the boundaries of the Chattahoochee River NRA(Figure 1).

Consultation with Park Staff

Once all of the potentially wadeable stream segments were identified, SECN staff met with park staff to: (1) identify reaches with current or potential management concerns; (2) determine issues that may prevent accessing the segment; and (3) determine the long-term applicability of each stream segment. During the meeting, five stream segments were discarded (see Table 1) because they were not of current management concern (p004), there were accessibility issues (p011), they were not on land owned by the park (p010 and p021), or the stream did not exist (p013). Two additional sites were added because the park had recently obtained new land (p037) or to provide a better access point (p038).

Field Suitability Evaluation

Field surveys were conducted to determine if the stream segment was suitable for long-term monitoring and to locate a potential reach within the candidate segment that is representative of the stream segment. The width, water depth, and bank height characteristics of the stream and an interpretation of the geomorphic conditions that characterize the site were recorded. Additionally, any conditions that make the stream unsuitable for sampling were also recorded. Conditions that make a stream segment unsuitable for sampling include (but are not limited to): presence of beaver dams or ponds; lack of a defined channel; or hazardous conditions such as treacherous wading conditions or difficult access to the stream (high undercut banks). The results of the suitability assessments and a map showing the location of each stream segment and how to access it can be found in Appendix A.

Basin-scale Assessment in GIS

A basin analysis was conducted to characterize the watershed characteristics (i.e., geomorphic basin characteristics and land cover conditions) of the stream segments that were classified as suitable and potentially (maybe) suitable (Table 2). This stage of segment selection determined the basin-scale similarities between segments so that paired segments could be selected and representative segments could be chosen that provide an understanding of similar streams in the park. The measures used to determine the geomorphic and land cover conditions represented by each stream segment are described in McDonald et al. (2018a) and detailed methods used to calculate these measures can be found in SOP 1.2.15 *Wadeable Stream Basin- and Segment-Scale Data Summary—Version 1.0* (McDonald et al. 2018c).

Final Decision

The results of the basin-scale assessment were used to assist in the final selection of stream segments (Table 3). Final stream segment selection was done by SECN staff that could provide the best professional judgment required to adequately assess reach utility, safety, and suitability issues. Chosen stream segments struck a balance between being relevant to management goals, being complementary to future studies, and were representative of conditions within the park.

The five sites that were classified as 'maybe' suitable were not selected for long-term monitoring due to access problems, safety concerns, and/or they were not representative of other streams in the park. The Richland Creek and Level Creek sites (p005 and p038) were not selected because they required long and steep hikes into the site and there was concern about whether the survey equipment could be safely carried to the streams. Briar Creek (p016) was also not selected due to safety concerns regarding the relatively steep and clayey banks. Additionally, the near-impenetrable vegetation surrounding Briar Creek also made the stream unsuitable for long-term monitoring. The stream at Gold Branch ("Underflow Creek", p022) was not chosen because it was so different from the other streams within the park and is likely affected by backwater effects from the Bull Sluice reservoir. Terrell Mill Creek (p029) was not chosen for monitoring because of the upstream pond being filled by "Diversion Creek" (p028) and the beaver dam that is effecting the downstream sections of "Beaver Creek" (p027).

The fourteen stream segments that were chosen for long-term monitoring were equally spread between the northern and southern portions of the park (seven in the northern units and seven in the southern units) (Table 3). One third-order stream was chosen in the north (Haw Creek, p001, CHAT001) and one third-order stream was chosen in the south (Long Island Creek, p033, CHAT013) so that they could be compared through time (pair 1). The two first-order streams on the eastern side of Bowmans Island ("Undercut Creek" [p002, CHAT002] and "Steep Draw Creek" [p003, CHAT003]) were chosen because they are of similar size and have similar amounts of development and forest (pair 2).

The third pair of sites that was chosen was "Crayfish Creek" (p037, CHAT004) and "Egg Creek" (p009, CHAT005) because they have similar-sized watersheds and very different land use/land cover (Table 2). "Crayfish Creek's" watershed is being actively developed and comparing these two streams through time may allow the effects of this development on stream evolution to be deciphered. The fourth pair of sites that was chosen for monitoring was Mulberry Creek (p023, CHAT008) and "Beaver Creek" (p027, CHAT010). These sites have very similar watershed characteristics and upstream land use/land cover. They were chosen and paired to determine if runoff from Roswell, Georgia has a detectable impact on Mulberry Creek in comparison to the suburban runoff that effects "Beaver Creek." The fifth pair of sites that was chosen for monitoring was Fox Creek (p023, CHAT009) and Cabin Creek (p032, CHAT012). These streams were chosen because they are similar-sized first-order streams but Fox Creek is much more affected by development in and around its watershed.

The sixth pair of sites that was chosen for monitoring was Gunby Creek (p030, CHAT011) and Whitewater Creek (p035, CHAT014). These stream segments were picked because upstream of both segments are areas of exposed bedrock. Additionally, these two streams will provide an interesting case study looking at a watershed with a high percentage of development (Gunby Creek) versus one with less developed land cover (Whitewater Creek). The last two sites that were chosen, "Three Mind Creek" (p015, CHAT006) and "Red Tail Creek" (p016, CHAT007), were chosen because they are representative of small – headwater streams and medium – high entrenchment streams respectively. In addition to the pairs of sites that were described above, in each baseline, change, and synthesis report, each stream in each stream order (first through third) will be compared to determine if any of them are significantly different from the rest of the streams in that stream order.

Table 1. List of all of the wadeable streams at Chattahoochee River National Recreation Area assessed during the spring of 2017. Stream suitability was classified as: Yes, No, Maybe, or N/A (if the site was discarded during consultation with the park). Park unit codes are: Bowmans Island (BI), Orrs Ferry (OF), Settles Bridge (SB), McGinnis Ferry (MF), Suwanee Creek (SC), Rogers Bridge (RB), Abbotts Bridge (AB), Holcomb Bridge (HB), Vickery Creek (VC), Gold Branch (GB), Johnson Ferry (JF), Cochran Shoals (CS), and Palisades (P). Stream types are: Small – Headwater (S-Hw), Medium – Low Entrenchment (M-LE), Medium – High Entrenchment (M-HE), Large – Low Entrenchment (L-LE), Extremely Entrenched (EE), Low Gradient – Multi-Channel (LG-MC), Bedrock Constrained (Bd), and Nonwadeable (Nw). Additionally, the following variables were abbreviated: Drainage Area (DA) and Total Stream Length (TSL). Stream names in quotations are not the official name of the stream.

pSite	Suitable	Park Unit	Name	Stream Type	Latitude	Longitude	DA (km^2)	TSL (km)	Stream Order	Percent DA managed	Percent TSL managed
p001	Yes	BI	Haw Creek	L-LE	34.1576	-84.0805	8.82	12.75	3	2%	3%
p002	Yes	BI	"Undercut Creek"	S-Hw	34.1529	-84.0782	0.30	0.95	1	56%	94%
p003	Yes	BI	"Steep Draw Creek"	S-Hw	34.1510	-84.0790	0.51	0.91	1	68%	100%
p004	N/A	BI	Unnamed	–	–	–	–	–	–	–	–
p005	Maybe	BI	Richland Creek (Up)	L-LE	34.1357	-84.0820	26.85	39.82	3	30%	7%
p006	No	BI	Richland Creek (Dn)	L-LE	34.1347	-84.0873	27.46	39.82	3	30%	7%
p037	Yes	OF	Bad Santa Creek	M-LE	34.1234	-84.0915	1.54	2.32	2	4%	17%
p007	No	OF	"Diggers' Creek"	LG-MC	34.1117	-84.0993	1.51	2.27	2	2%	6%
p008	No	SB	"Deer Stand Creek"	M-LE	34.1053	-84.1006	1.47	1.77	2	2%	8%
p009	Yes	SB	"Egg Creek"	M-LE	34.0991	-84.1054	0.77	1.20	2	11%	29%
p010	N/A	SB	Unamed	–	–	–	–	–	–	–	–
p011	N/A	SB	Level Creek	–	–	–	–	–	–	–	–
p038	Maybe	SB	Level Creek	L-LE	34.0799	-84.1026	2.42	29.68	3	1%	4%
p012	No	SB	"Berm Creek"	EE	34.0639	-84.1086	1.40	1.80	2	2%	24%
p013	N/A	SB	Unnamed	–	–	–	–	–	–	–	–
p014	No	MF	"Canyon Creek"	EE	34.0419	-84.1147	1.44	1.39	2	16%	48%
p015	Yes	SC	"Three Mind Creek"	S-Hw	34.0291	-84.1235	0.17	0.52	1	37%	85%
p016	Yes	RB	"Crazy Eye Creek"	M-HE	34.0317	-84.1395	2.33	2.58	2	3%	9%
p017	No	AB	"Privet Creek"	M-HE	34.0303	-84.1664	2.06	2.25	2	13%	13%
p018	Maybe	AB	"Briar Creek"	M-HE	34.0251	-84.1676	4.01	4.20	3	1%	9%
p019	No	HB	Crooked Creek	L-LE	33.9696	-84.2678	23.75	21.71	3	0.4%	3%
p020	No	VC	Big Creek (Dn)	Nw	34.0105	-84.3555	268.77	–	5	–	–
p021	N/A	VC	Big Creek (Up)	–	–	–	–	–	–	–	–
p022	Maybe	GB	"Underflow Creek"	LG-MC	33.9860	-84.3825	0.81	1.06	1	22%	38%
p023	Yes	JF	Mulberry Creek	M-LE	33.9572	-84.3946	1.65	3.02	2	14%	32%
p024	No	CS	Sope Creek	Nw	33.9398	-84.4371	85.54	90.14	4	1%	2%
p025	No	CS	"Gully Creek"	S-Hw	33.9378	-84.4394	0.32	0.58	1	95%	100%
p026	Yes	CS	"Fox Creek"	M-LE	33.9309	-84.4363	0.49	0.37	1	83%	100%
p027	Yes	CS	"Beaver Creek"	M-LE	33.9209	-84.4502	1.96	1.97	2	15%	42%
p028	No	CS	"Diversion Creek"	Bd	33.9180	-84.4553	0.48	2.01	1	6%	25%
p029	Maybe	CS	Terrell Mill Creek	M-LE	33.9160	-84.4484	3.76	4.48	3	19%	45%

Table 1 (continued). List of all of the wadeable streams at Chattahoochee River National Recreation Area assessed during the spring of 2017. Stream suitability was classified as: Yes, No, Maybe, or N/A (if the site was discarded during consultation with the park). Park unit codes are: Bowmans Island (BI), Orrs Ferry (OF), Settles Bridge (SB), McGinnis Ferry (MF), Suwanee Creek (SC), Rogers Bridge (RB), Abbotts Bridge (AB), Holcomb Bridge (HB), Vickery Creek (VC), Gold Branch (GB), Johnson Ferry (JF), Cochran Shoals (CS), and Palisades (P). Stream types are: Small – Headwater (S-Hw), Medium – Low Entrenchment (M-LE), Medium – High Entrenchment (M-HE), Large – Low Entrenchment (L-LE), Extremely Entrenched (EE), Low Gradient – Multi-Channel (LG-MC), Bedrock Constrained (Bd), and Nonwadeable (Nw). Additionally, the following variables were abbreviated: Drainage Area (DA) and Total Stream Length (TSL). Stream names in quotations are not the official name of the stream.

pSite	Suitable	Park Unit	Name	Stream Type	Latitude	Longitude	DA (km^2)	TSL (km)	Stream Order	Percent DA managed	Percent TSL managed
p030	Yes	CS	Gunby Creek	M-LE	33.9110	-84.4522	1.06	1.39	2	15%	52%
p031	No	P	"Tree Rub Creek"	S-Hw	33.8932	-84.4389	0.75	1.44	1	10%	31%
p032	Yes	P	Cabin Creek	S-Hw	33.8901	-84.4363	0.29	0.80	1	58%	77%
p033	Yes	P	Long Island Creek	L-LE	33.8837	-84.4329	16.51	18.26	3	2%	7%
p034	No	P	Rottenwood Creek	Nw	33.8812	-84.4510	50.98	40.61	4	1%	4%
p035	Yes	P	Whitewater Creek	M-LE	33.8775	-84.4405	2.68	5.21	2	2%	12%
p036	No	P	"Muck Creek"	M-HE	33.8680	-84.4557	6.02	7.66	3	1%	4%

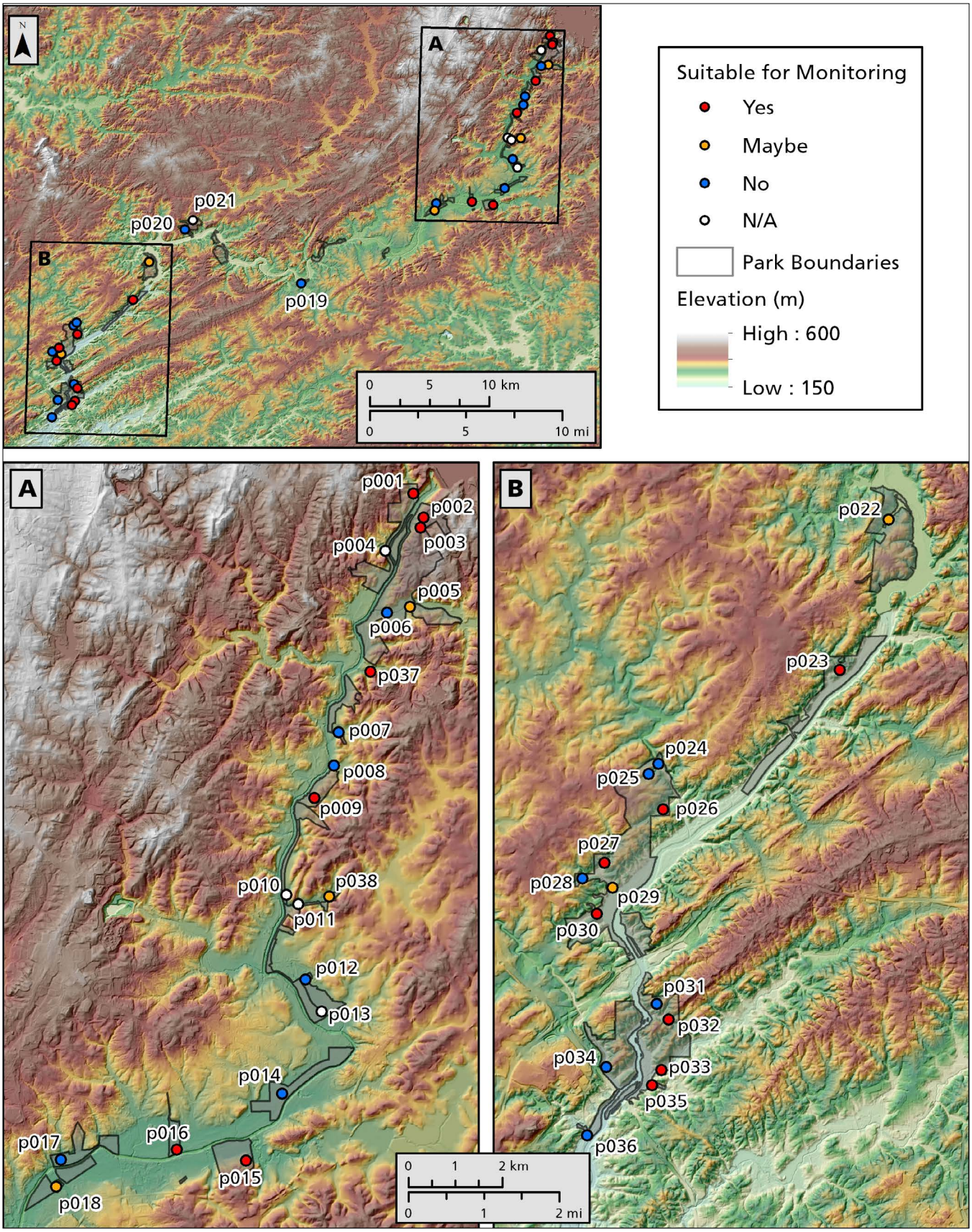


Figure 2. Overview map of sites that were assessed to determine their suitability for long-term monitoring according to the criteria outlined in the SECN wadeable stream monitoring protocol (McDonald et al. 2018a). Segments marked as N/A were excluded from the assessment during the meeting with park staff.

Table 2. Sites that were determined to be potentially suitable for monitoring. To save space, the following variables were abbreviated: Stream Order (SO), Drainage Area (DA), Entire Stream Gradient (ESG), Basin Slope (BS), Basin Relief (BR), Percent that is developed (D), Percent that is forested (F), Percent that is grass/pasture (G). Stream names in quotations are not the official name of the stream.

pSite	Park Unit	Stream Name	Stream Type	Suitable	SO	DA (km^2)	ESG (%)	BS (°)	BR (km)	D (%)	F (%)	G (%)
p001	BI	Haw Creek	L-LE	Y	3	9.56	0.0136	7.18	0.126	58	37	4
p002	BI	"Undercut Creek"	S-Hw	Y	1	0.33	0.0660	9.47	0.082	16	82	1
p003	BI	"Steep Draw Creek"	S-Hw	Y	1	0.54	0.0718	10.90	0.083	15	85	0
p005	BI	Richland Creek	L-LE	M	3	28.97	0.0067	7.45	0.103	58	33	6
p037	OF	"Crayfish Creek"	M-LE	Y	2	1.50	0.0279	8.30	0.074	55	39	5
p009	SB	"Egg Creek"	M-LE	Y	2	0.83	0.0443	8.39	0.071	11	83	2
p038	SB	Level Creek	L-LE	M	3	24.13	0.0048	4.95	0.084	63	29	6
p015	SC	"Three Mind Creek"	S-Hw	Y	1	0.19	0.0607	8.24	0.051	68	32	0
p016	RB	"Crazy Eye Creek"	M-HE	Y	2	2.58	0.0151	3.82	0.074	32	41	25
p018	AB	"Briar Creek"	M-HE	M	3	4.26	0.0104	4.78	0.066	76	22	1
p022	GB	"Underflow Creek"	LG-MC	M	1	0.90	0.0287	8.13	0.057	61	39	0
p023	JF	Mulberry Creek	M-LE	Y	2	1.78	0.0266	6.78	0.070	63	33	3
p026	CS	Fox Creek	M-LE	Y	1	0.53	0.0482	8.55	0.059	21	77	0
p027	CS	"Beaver Creek"	M-LE	Y	2	2.12	0.0219	5.29	0.068	71	27	2
p029	CS	Terrell Mill Creek	M-LE	M	3	4.07	0.0231	6.05	0.085	62	37	1
p030	CS	Gunby Creek	M-LE	Y	2	1.15	0.0304	7.78	0.080	77	23	0
p032	P	Cabin Creek	S-Hw	Y	1	0.31	0.0614	11.80	0.071	21	79	0
p033	P	Long Island Creek	L-LE	Y	3	18.26	0.0070	8.71	0.109	60	40	0
p035	P	Whitewater Creek	M-LE	Y	2	2.90	0.0165	8.08	0.081	46	52	0

Table 3. Sites that were chosen for long-term monitoring. The final site numbers were determined after consultation with park staff. To save space, the following variables were abbreviated: Stream Order (SO), Drainage Area (DA), Bankfull Width (BfW), Water Depth (WD), and Bank Height (BH). Pairs refers to how the reaches will be compared (in addition to the comparisons based on stream order) in the annual and synthesis reports. Stream names in quotations are not the official name of the stream.

pSite	Site Name	Park Unit	Stream Name	Lat	Long	Stream Type	SO	DA (km^2)	WW (m)	BfW (m)	WD (cm)	BH (m)	Pairs
p001	CHAT001	BI	Haw Creek	34.158	-84.080	L-LE	3	8.8	4.0	7.0	10.0	2.0	1
p002	CHAT002	BI	"Undercut Creek"	34.153	-84.078	S-Hw	1	0.3	1.3	2.3	12.0	0.5	2
p003	CHAT003	BI	"Steep Draw Creek"	34.151	-84.079	S-Hw	1	0.5	1.5	4.0	10.0	0.8	2
p037	CHAT004	OF	"Crayfish Creek"	34.123	-84.092	M-LE	2	1.5	2.0	5.0	12.5	1.0	3
p009	CHAT005	SB	"Egg Creek"	34.099	-84.105	M-LE	2	0.8	2.0	3.5	7.5	1.0	3
p015	CHAT006	SC	"Three Mind Creek"	34.029	-84.124	S-Hw	1	0.2	1.0	2.0	7.5	2.0	--
p016	CHAT007	RB	"Red Tail Creek"	34.032	-84.139	M-HE	2	2.3	1.5	2.0	10.0	0.3	--
p023	CHAT008	JF	Mulberry Creek	33.957	-84.395	M-LE	2	1.6	2.0	8.0	7.5	1.0	4
p026	CHAT009	CS	"Fox Creek"	33.931	-84.436	S-Hw	1	0.5	1.5	4.0	10.0	1.0	5
p027	CHAT010	CS	"Beaver Creek"	33.921	-84.450	M-LE	2	2.0	3.0	7.0	20.0	1.0	4
p030	CHAT011	CS	Gunby Creek	33.911	-84.452	M-LE	2	1.1	2.0	4.5	10.0	1.0	6
p032	CHAT012	P	Cabin Creek	33.890	-84.436	S-Hw	1	0.3	1.0	1.5	12.5	0.3	5
p033	CHAT013	P	Long Island Creek	33.884	-84.433	L-LE	3	16.5	2.0	8.0	40.0	1.5	1
p035	CHAT014	P	Whitewater Creek	33.877	-84.440	M-LE	2	2.7	1.4	2.5	7.5	0.5	6

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Appendix A. Stream Segment Assessments



Proposed Site Number: p001

Park Unit: Bowmans Island

Stream Name: Haw Creek (CHAT 001)

Date: 3.16.2017

Time: 7:45 a.m.

Assessed by: JMM

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Bowmans Island parking lot (by Buford Dam).

Directions from Parking to Site: Walk across bridge and hike upstream to site.

Management Issues Noted: Proximity to Buford Dam and bridge (downstream), backflow from dam 303(d) listed stream.

Safety Concerns: High banks (usually only on one side), potential backwater effects.

Site Summary—Haw Creek is a medium-sized cobble-bedded stream with high concentrations of sand and gravel in the lower energy areas. Wetted width was estimated to be approximately 4 meters (13.1 feet [ft]) and bankfull width around 7 meters (22.9 ft). Water depth in the riffle areas ranged from 10–15 centimeters (3.9–5.9 inches [in]). Bank heights were approximately 1 meter (3.3 feet) where floodplains were present and up to 3 meters (9.8 ft) where the stream was cutting into the historical terrace. Initial assessment of the creek classified the entrenchment of the segment as moderately-low. Some well-developed point bars have developed and were usually paired with relatively high (2.5–3 meters [8.2–9.8 ft]) banks on the opposite bank. Stream banks are mostly covered by mosses and grasses. The cutbank side of the meander bends tended to have less vegetative cover (approximately 40%) than the point bars (approximately 70%). Large woody debris is present and many of the pieces appear to be the result of bank failure/slumping events. From the bridge to the proposed site (p001mid) there is a high frequency of cobble/gravel bars, and some of them have become vegetated (mostly by grasses). On river right at p001mid, the floodplain looks like it contains a meander scar or flood chute (or a flood chute occupying a meander scar). Moving downstream from p001mid (near point p001), there are a few areas where bedrock extrudes from the channel margin on river left.

Monitoring Recommendation—This site is recommended for monitoring (Figure A-1) due to the interest that was expressed by park staff, the 303(d) listed status of the stream, and its proximity to Buford dam.

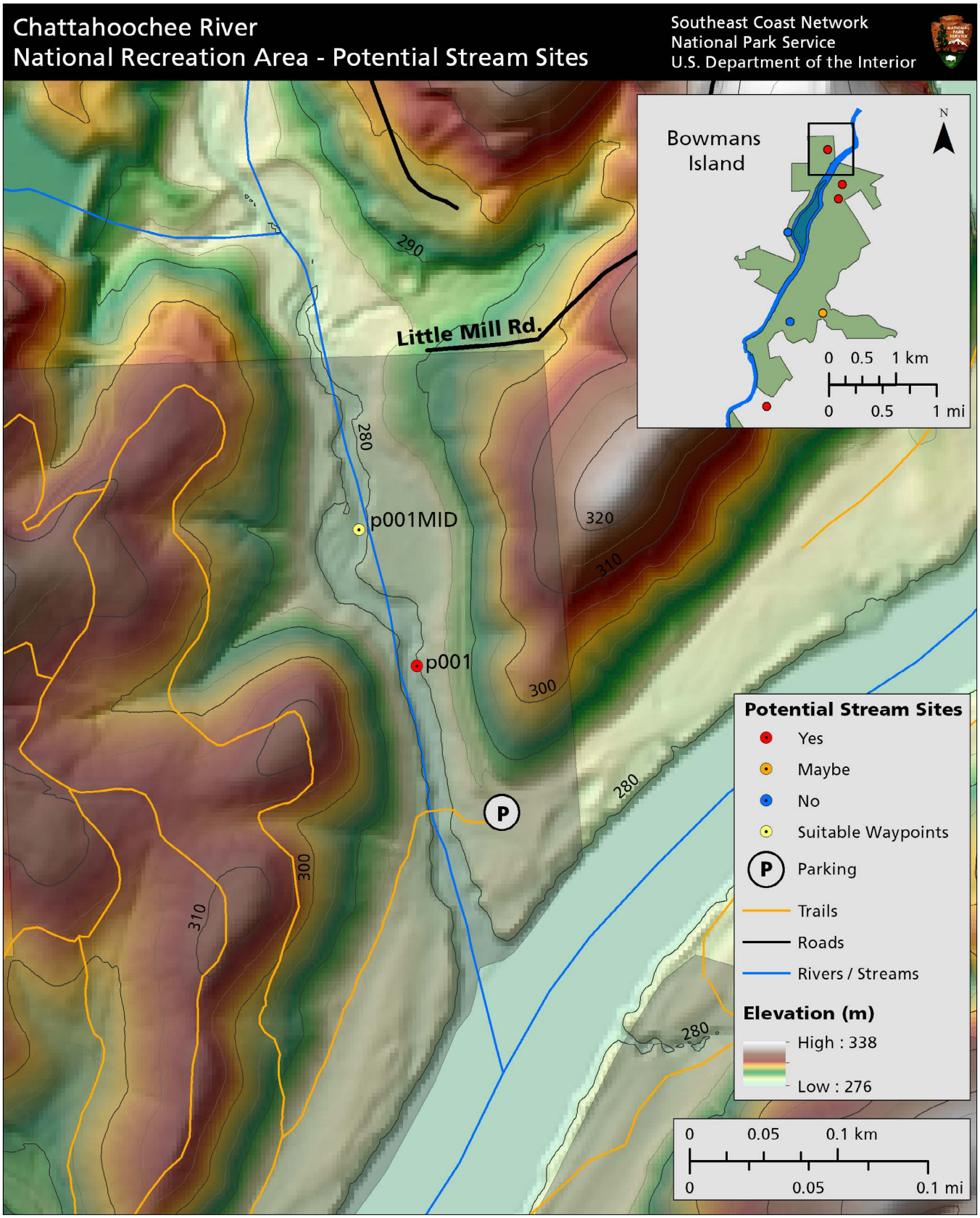


Figure A-1. Map of Haw Creek (p001) which flows through the western portion of the Bowmans Island management unit.



Proposed Site Number: p002

Park Unit: Bowmans Island

Stream Name: "Undercut Creek" (CHAT 002)

Date: 3.24.2017

Time: 11:02 a.m.

Assessed by: JMM, AMC and CSC

Accessible: Yes/No

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Island Ford Church or Bowmans Island-West or Bowman Island-East.

Directions from Parking to Site: Follow drainage down past p003 if parked at church, otherwise walk along trails to site from the parking area near the boat ramp in Bowmans Island-East.

Management Issues Noted: Severe undercutting, algae, oily sheen to water, mucky bed.

Safety Concerns: Steep trek in if park near Island Ford Church (850 Island Ford Rd., Buford GA) or relatively long trek if park at the Buford Dam.

Site Summary—"Undercut Creek" (unnamed first order) is a smaller mucky sand bedded stream with some larger particles (cobbles and gravels) that have been buried by the finer material. Wetted width was estimated to be approximately 1.25 meters (4.1 ft) and bankfull width around 2.25 meters (7.4 ft). Water depth in the riffle areas ranged from 10–15 centimeters (3.9–5.9 in). Bank heights were approximately 0.5 meter (1.6 ft) where floodplains were present and up to 3 meters (9.8 ft) where the stream was cutting into the hillslope. Initial assessment of the creek classified the entrenchment of the segment as low. Floodplains have developed on both sides of the stream in the area near p002up. The banks were fairly well vegetated (approximately 70%) with mosses, ferns, and leaves being the dominant cover. Large woody debris is present and serving multiple functions such as habitat creation and bank protection. Undercutting is severe in some areas and there are quite a few trees near to failing. Unlike p003, there are large concentrations of fine material on the stream bed. Banks are composed of fines with larger gravel and cobble inclusions. The new proposed site (p002up) was moved downstream from p002 because near p002 the stream is being heavily influenced by its proximity to the hillslope.

Monitoring Recommendation—This site is recommended for monitoring (Figure A-2) due to the fact that a well-developed floodplain has developed on both sides of the stream near p002up. Additionally, the difference in bed material between this site and p003 makes for an interesting case study comparing the evolution of these two streams.

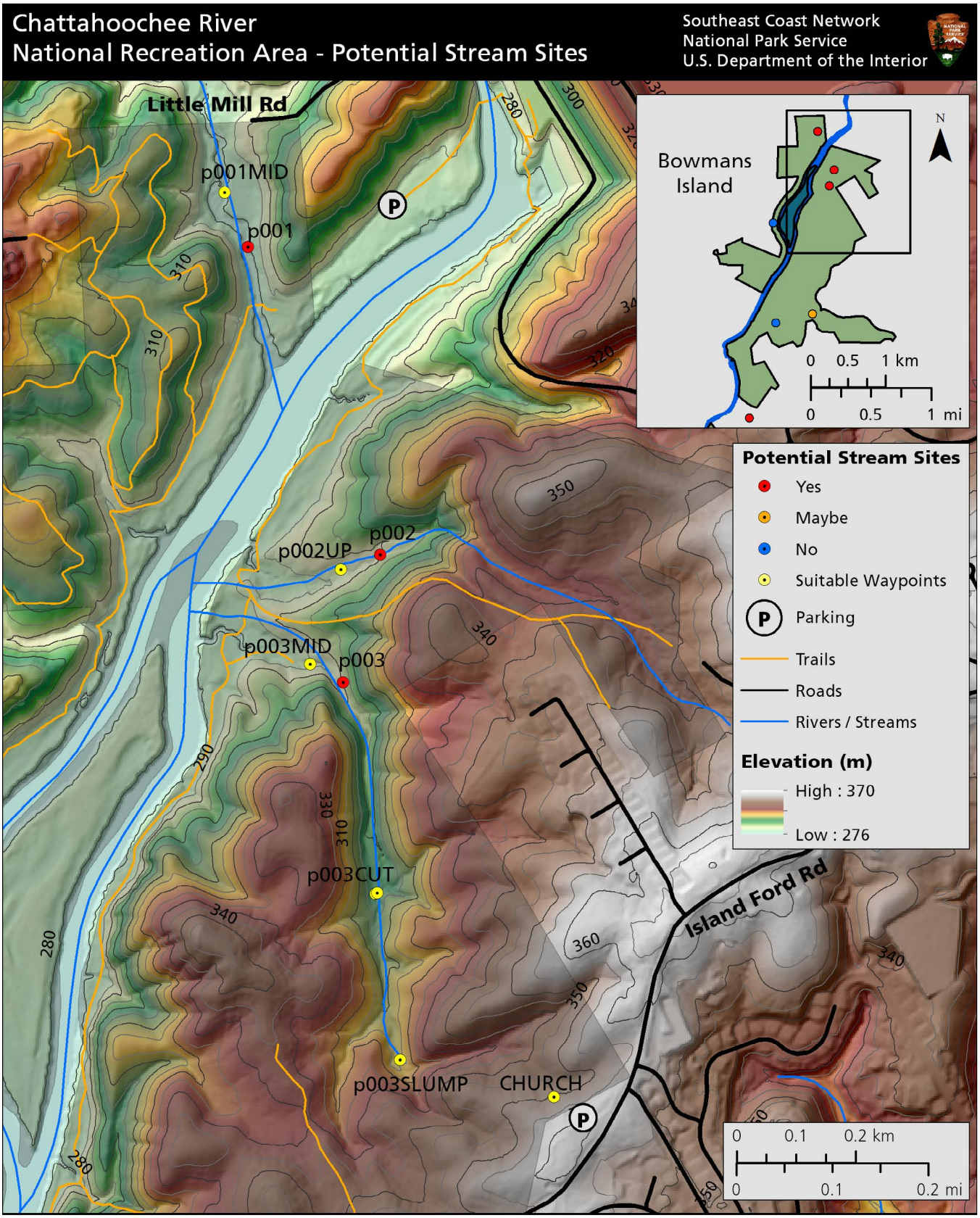


Figure A-2. Map of "Undercut Creek" (p002) and "Steep Draw Creek" (p003) which flow through the eastern portion of the Bowmans Island management unit.



Proposed Site Number: p003

Park Unit: Bowman Island

Stream Name: "Steep Draw Creek"(CHAT 003)

Date: 3.24.2017

Time: 10:19 a.m.

Assessed by: JMM, AMC, and CSC

Accessible: Yes/No

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Maybe

Best Point of Access/Parking: Island Ford Church (850 Island Ford Rd., Buford, GA) or Bowmans Island-West or Bowmans Island-East.

Directions from Parking to Site: Follow drainage down to site if park at Island Ford Church, otherwise walk along trails to site from the parking area near the boat ramp in Bowmans Island-East.

Management Issues Noted: Trash, undercut banks.

Safety Concerns: Steep trek in, deep piles of leaves.

Site Summary—"Steep Draw Creek" (unnamed first order) is a smaller cobbly sand bedded stream with higher concentrations of sand in the lower energy areas. Wetted width was estimated to be approximately 1.5 meters (4.9 ft) and bankfull width around 4 meters (13.1 ft). Water depth in the riffle areas was approximately 10 centimeters (3.9 in). Bank heights were approximately 0.75 meter (2.5 ft) where floodplains were present and around 1.5 meters (4.9 ft) high where the stream was cutting into the historical terrace. Initial assessment of the creek classified the entrenchment of the segment as moderate. Floodplains have developed behind point bars in a few areas near p003mid. Downstream of p003mid, the valley flattens out a bit and there is floodplain on both sides in some places. The banks were fairly well vegetated (approximately 50–90%) with mosses and leaves being the dominant cover. Large woody debris is present and serving multiple functions such as habitat creation and bank protection. Many of the banks are undercut and there are a few trees near to failing. A number of smaller (ephemeral) drainages were observed entering the stream throughout the segment. Upstream between p003slump and p003cut, the stream valley significantly flattens out and the stream becomes complex and multi-channelish and marshy. The valley is very constricting on the stream in some portions of the drainage.

Monitoring Recommendation—This site is recommended for monitoring (Figure A-3) because the differences in bed material between this site and p002 and the urbanization history of the two watersheds (p002 developed prior to 2001 and p003 only recently developed) makes for an interesting case study comparing the evolution of these two streams.

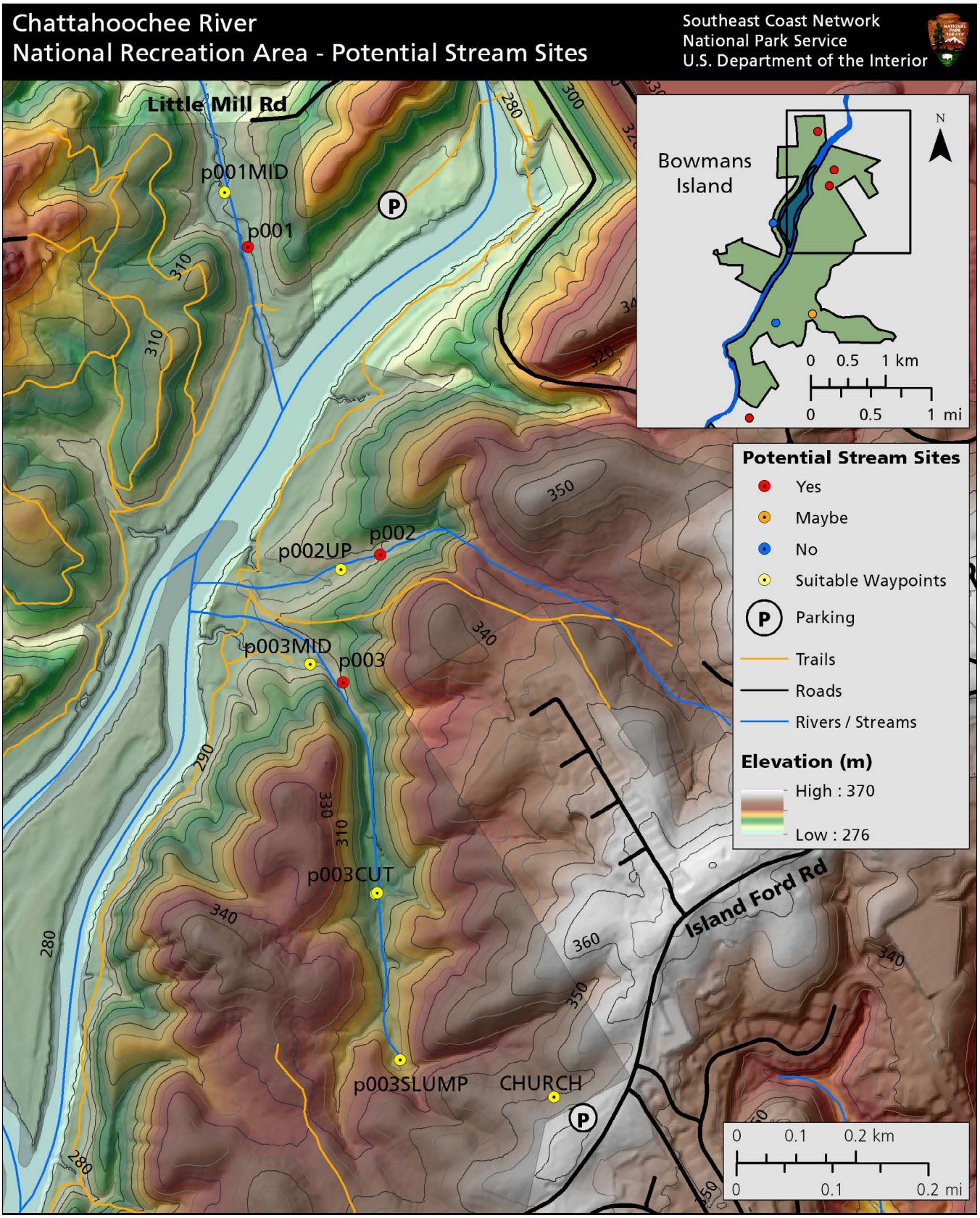


Figure A-3. Map of "Undercut Creek" (p002) and "Steep Draw Creek" (p003) which flow through the eastern portion of the Bowmans Island management unit.



Proposed Site Number: p005

Park Unit: Bowmans Island

Stream Name: Richland Creek

Date: 3.15.2017

Time: 4:19 p.m.

Assessed by: JMM and ENS

Accessible: Yes/No (See below)

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Maybe

Best Point of Access/Parking: Park on Island Ford Rd. near Island Ford Church (850 Island Ford Rd., Buford, GA).

Directions from Parking to Site: Walk to gate, continue to park property, follow small wash to tributary down to Richland Creek historical terrace, and then follow GPS to site.

Management Issues Noted: High-walled dam on tributary upstream, potential cattle influence on Richland Creek upstream or on tributary.

Safety Concerns: High banks, long steep trek to site.

Site Summary—Richland Creek is a gravelly sand bedded larger-sized stream with higher concentrations of gravel on the in-channel bars. Wetted width was estimated to be approximately 5 meters (16.4 ft) and bankfull width around 8 to 9 m (26.2 to 29.5 ft). Water depth in the riffle areas was around 20 centimeters (7.9 in) and deeper (up to 0.5 to 1 meter [1.6 to 3.3 ft]) in the pools. Bank heights ranged from 0.6 meter (2 ft) where floodplains had developed up to 4 meters (13.1 ft) where the stream is eroding into the historical terrace. This initial assessment classified the entrenchment of the stream as low. The banks tended to be relatively bare (0–30% vegetated) with grasses being the dominant vegetative cover where present. Large woody debris is present and there was a large jam on river right near p005. A smallish wetland area has developed on the historical terrace leading to the site. Dog tracks on the sandy point bars provide some evidence that this stream is frequented by the public.

Monitoring Recommendation—This site is potentially recommended for monitoring (Figure A-4) due to the interest that was expressed by park staff and the 303(d) listed status of the stream. The main problem with monitoring this site is the long steep trek that is needed to access the site. Due to the safety concerns associated with hauling equipment into the site, this site is only recommended for monitoring if the park can provide easier access to the site (potentially through the adjacent golf course).

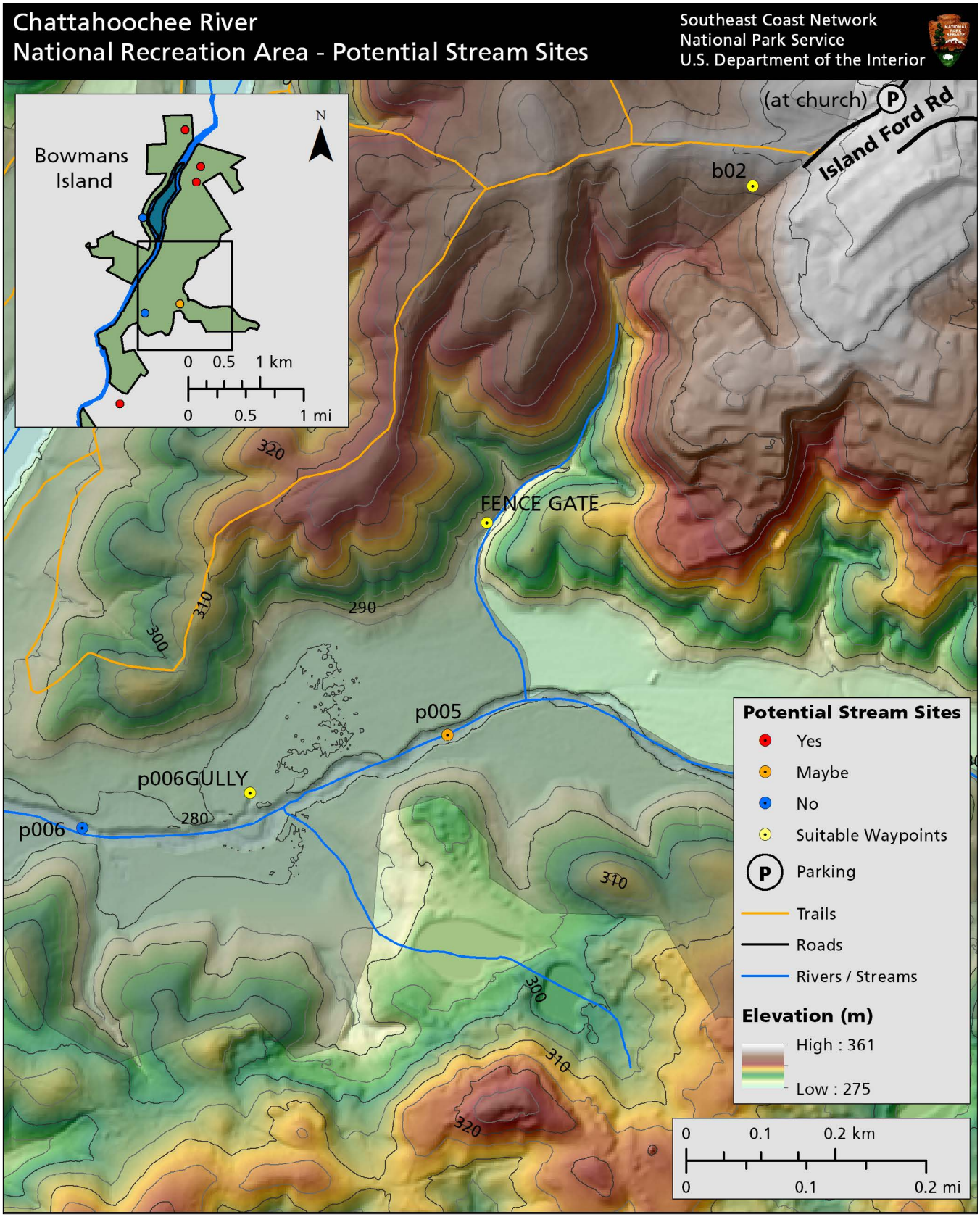


Figure A-4. Map of Richland Creek (p005 and p006) which flow through the eastern portion of the Bowmans Island management unit.



Proposed Site Number: p006

Park Unit: Bowmans Island

Stream Name: Richland Creek

Date: 3.15.2017

Time: 4:47 p.m.

Assessed by: JMM and ENS

Accessible: Yes/No (See below)

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Park on Island Ford Road near Island Ford Church (850 Island Ford Rd., Buford, GA).

Directions from Parking to Site: Walk to gate, continue to park property, follow small wash to tributary down to Richland Creek historical terrace, and then follow GPS to site.

Management Issues Noted: Tributary from golf course enters upstream, potential wild pig habitat, and see p005.

Safety Concerns: High banks, long steep trek to site, potential for pig encounters.

Site Summary—Richland Creek is a gravelly sand bedded larger-sized stream inset in an entrenched valley with higher concentrations of gravel on the in-channel bars. Wetted width was estimated to be approximately 6 meters (19.7 ft) and bankfull width around 9 to 10 meters (29.5 to 32.8 ft). Water depth in the riffle areas was around 20 centimeters (7.9 in) and deeper (up to 0.5 to 1 meter [1.6 to 3.3 ft]) in the pools. Bank heights ranged from 1 meter (3.3 ft) where floodplains had developed up to 4 meters (13.1 ft) where the stream is eroding into the historical terrace. This initial assessment classified the entrenchment of the stream as medium because the floodplains are less developed near this proposed site than p005. The banks tended to be relatively bare (0–25% vegetated) with mosses and grasses being the dominant vegetative cover where present. Large woody debris is present and is serving multiple functions (i.e., bank protection and habitat creation). The tributary draining the golf course has a large jam at its mouth. There are also a few rock outcrops and protruding bedrock downstream of this tributary. A very large tree trunk is in a sandy 'bar' in the middle of the stream. This tree looks like it grew there so this 'bar' is potentially a slump or cutoff portion of the bank. Potential wild pig tracks were observed on the sandy point bars (came across scat and tracks on the way to the site).

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-5) because of the safety concerns associated with the high stream banks and the steep trek into the site.

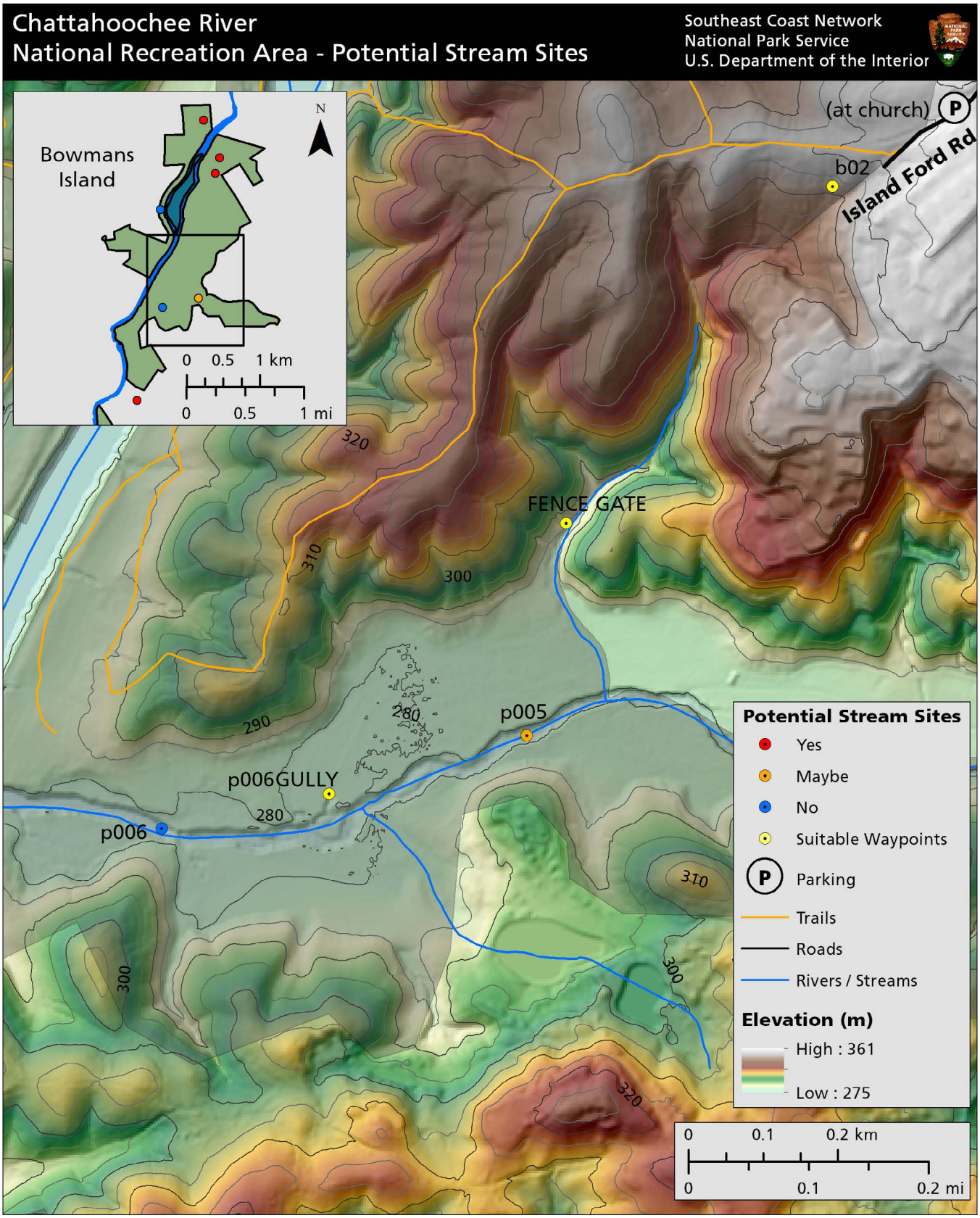


Figure A-5. Map of Richland Creek (p005 and p006) which flow through the eastern portion of the Bowmans Island management unit.



Proposed Site Number: p007
Park Unit: Orrs Ferry
Stream Name: "Diggers Creek"
Date: 3.15.2017
Time: 2:46 p.m.
Assessed by: JMM and ENS
Accessible: Yes
Gate Key Required: No
Wadeable: Yes
Recommend for Monitoring: No

Best Point of Access/Parking: In the amenities parking off of Wild Timber Road (6235 Wild Timber Rd., Sugar Hill, GA).

Directions from Parking to Site: Stream is approximately 75 meters (246 ft) from parking lot.

Management Issues Noted: A bunch of shallow holes have been dug on the historical terrace, trash, pond upstream, multiple channels, and gullies.

Safety Concerns: Dug holes, small gullies, downed wood (snake potential).

Site Summary—"Diggers' Creek" (unnamed first order) is a small sandy clay bedded stream (clay on top of sandy with some gravel on bars) draining a pond owned by the upstream development. Wetted width was estimated to be approximately 1.5 meters (4.9 ft) and bankfull width around 2 meters (6.6 ft). Water depth in the riffle areas was around 10–15 centimeters (3.9–5.9 in). Bank heights ranged from 0.25 meter (0.8 ft) where floodplains had developed and up to 1.5 meters (4.9 ft) high where the stream is eroding into the historical terrace. This initial assessment classified the entrenchment of the stream as medium because, though some floodplains have developed, there are significant portions of the stream that have not developed a floodplain. The banks tended to be either bare (0–25% vegetated) or have significant cover (up to 70%) with mosses and grasses being the dominant vegetative cover where present. There are high concentrations of large woody debris in and around the stream. There is a lot of orange (iron) flocking in the water. Some multi-channel flow/gullies are present that look to be draining groundwater that lead into the main channel. A bunch of shallow holes have been dug in the historical terrace (possibly by children living in the surrounding neighborhood).

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-6) because of the large pond that regulates the flow through this stream segment. Additionally, this site is also not recommended due to the complex multi-channel floodplain system that characterizes this site.

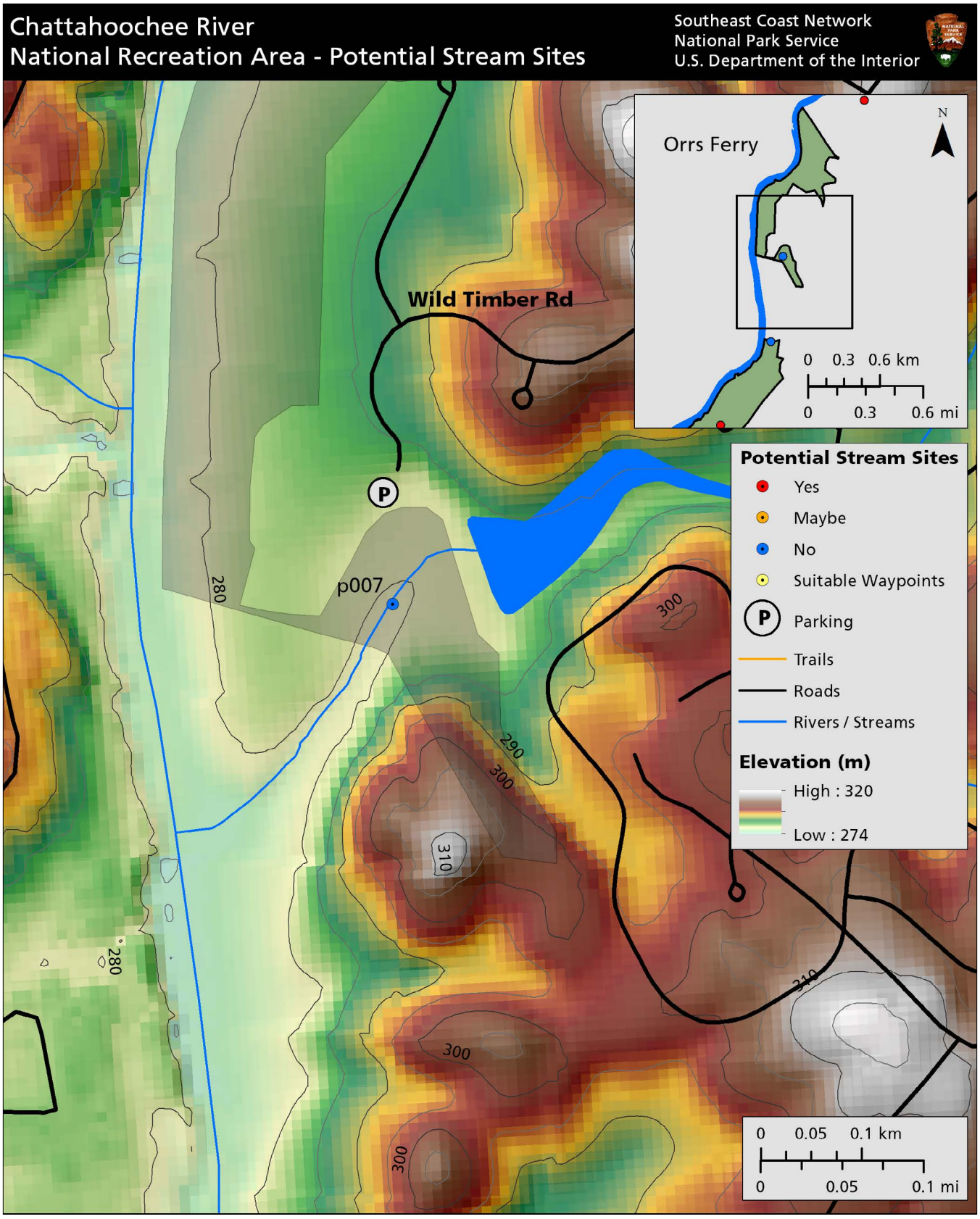


Figure A-6. Map of "Diggers' Creek" (p007) which flows through the Orrs Ferry management unit.



Proposed Site Number: p008

Park Unit: Settles Bridge

Stream Name: "Deer Stand Creek"

Date: 3.15.2017

Time: 11:21 a.m.

Assessed by: JMM, ENS and PDM

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Settles Bridge boat landing parking lot.

Directions from Parking to Site: Walk trail to stream (approximately 1 kilometer [0.62 miles]).

Management Issues Noted: Sewage right-of-way, deer stand facing creek.

Safety Concerns: Homeowners adjacent, rip rap on right of way.

Site Summary— "Deer Stand Creek" (unnamed first order) is a moderately entrenched small mucky sand bedded stream (with some gravel on bars). Wetted width was estimated to be approximately 1.5 meters (4.9 ft) and bankfull width around 3 meters (9.8 ft). Water depth in the riffle areas was around 10 centimeters (3.9 in) with pools around 30 centimeters (11.8 in) deep. Bank heights were approximately 0.75 meter (2.5 ft) where floodplains had developed. This initial assessment classified the entrenchment of the stream as medium because, though some floodplains have developed, there are significant portions of the stream that have not developed a floodplain. The banks were relatively well vegetated (around 70%), though there were some bare areas (0–25%), with mosses and grasses being the dominant vegetative cover where present. While there were not many pieces of large woody debris in the stream, there was a lot of undercutting of the trees on the banks and many of the undercut banks are in danger of failing. There is rip rap on both banks where the right-of-way crosses.

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-7) because of the short stream segment and because only one side of the stream is owned by the park.

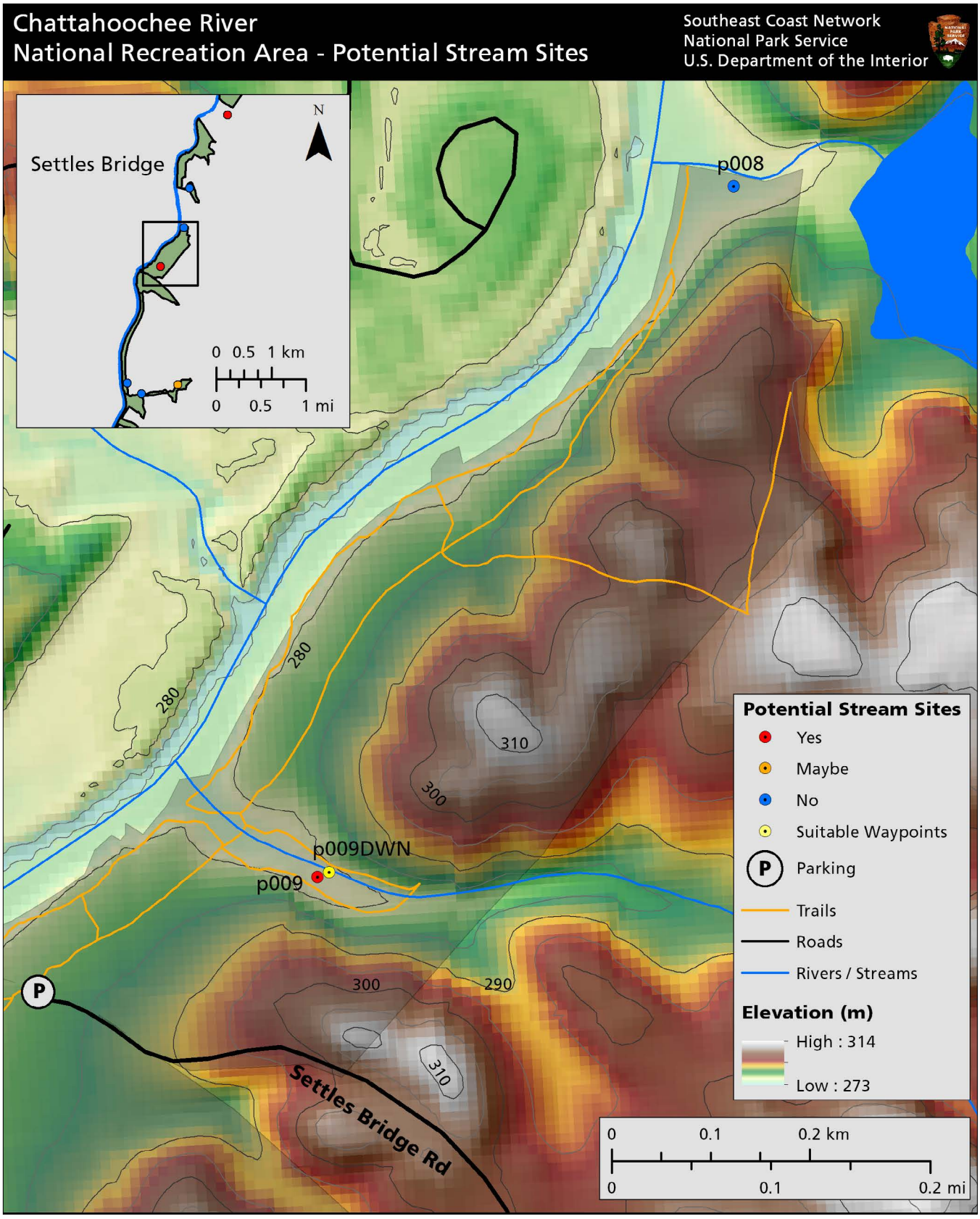


Figure A-7. Map of "Deer Stand Creek" (p008) which flows through the Settles Bridge management unit.



Proposed Site Number: p009
Park Unit: Settles Bridge
Stream Name: "Egg Creek"(CHAT 005)
Date: 3.15.2017
Time: 10:54 a.m.
Assessed by: JMM, ENS and PDM
Accessible: Yes
Gate Key Required: No
Wadeable: Yes
Recommend for Monitoring: Yes

Best Point of Access/Parking: Settles Bridge boat landing parking lot.

Directions from Parking to Site: Walk trail to stream (approximately 250 meters [273.4 yards]).

Management Issues Noted: Trails near stream, pipeline right-of-way downstream, trees slumping.

Safety Concerns: Tree fall (not a major concern).

Site Summary—"Egg Creek" (unnamed 1st order) is a small sandy bedded stream (with some gravel and cobble). Wetted width was estimated to be approximately 2 meters (6.6 ft) and bankfull width around 3–4 meters (9.8–13.1 ft). Water depth in the riffle areas was around 5–10 centimeters (16.4–32.8 ft). Bank heights were approximately 0.5 meter (1.6 ft) where floodplains had developed and around 1.5 meters (4.9 ft) high where the stream is eroding into the historical terrace. This initial assessment classified the entrenchment of the stream as medium because, though some floodplains have developed, there are also significant portions of the stream that have not developed a floodplain. The banks were mostly bare (0–10% vegetated) with mosses being the dominant vegetative cover where present. While there were not many pieces of large woody debris in the stream, there was a lot of undercutting of the trees (exposed tree roots) on the banks and many of the undercut banks are in danger of failing. Proposed site p009 down is just upstream of some boulders. The area upstream of the boulders is suggested for monitoring because the floodplain areas are less well developed and change is expected in this area. Long filaments of algae were observed in the stream as well as caddisfly casings and fish eggs underneath some of the larger cobbles.

Monitoring Recommendation— This site is recommended for monitoring (Figure A-8) because the presence of caddisfly cases and fish eggs indicates relatively good water quality. Additionally, this stream is in a stage of development that is similar to other streams in the park (e.g., p008, p026, and p027) and is a good representation of the changes that will occur on these similar streams.

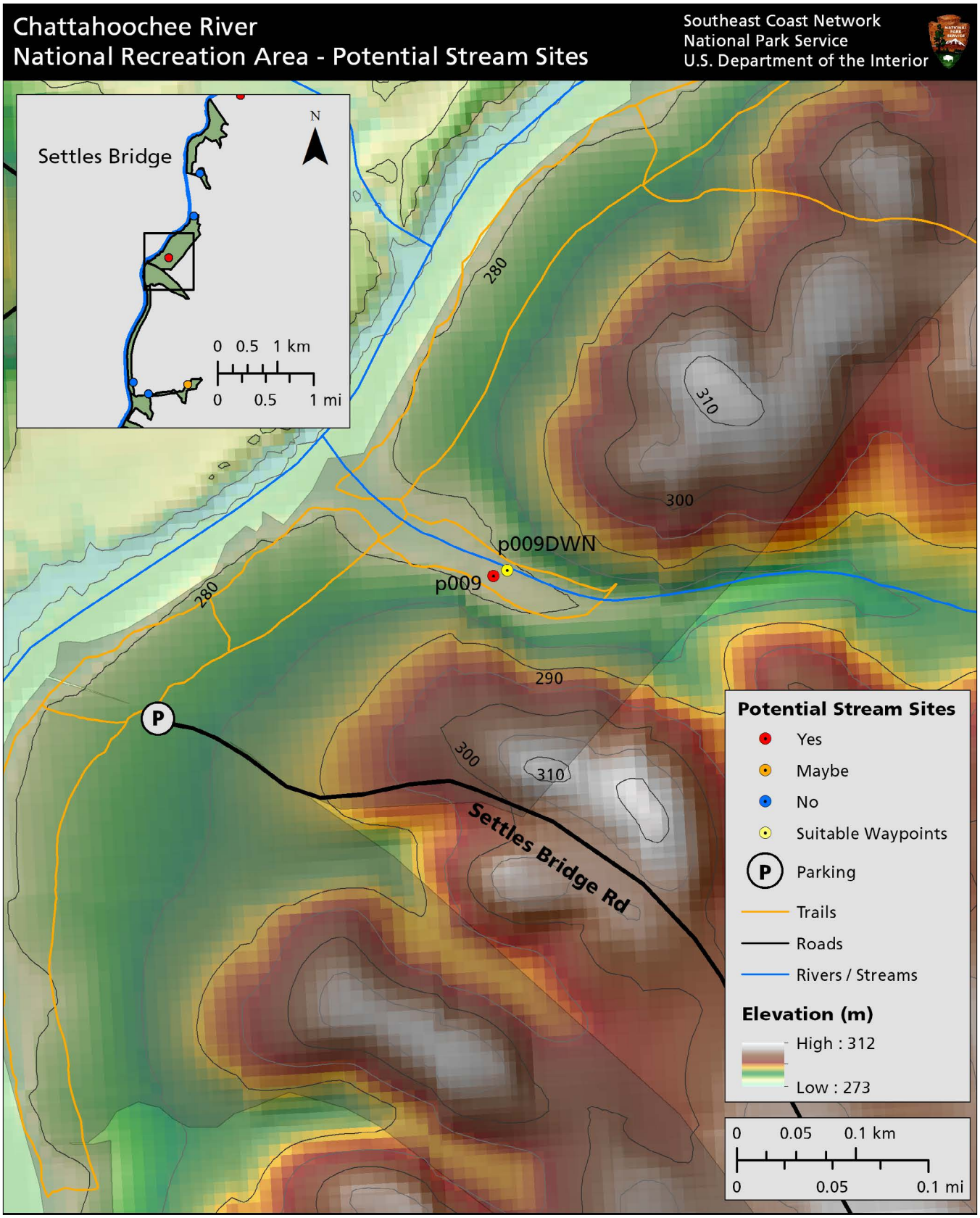


Figure A-8. Map of "Egg Creek" (p009) which flows through the Settles Bridge management unit.



Proposed Site Number: p012

Park Unit: Settles Bridge

Stream Name: "Berm Creek"

Date: 3.15.2017

Time: 12:27 p.m.

Assessed by: JMM, ENS and PDM

Accessible: No (high banks)

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Park on Meadow Park Lane (approximately 4850 Meadow Park Lane, Suwanee, GA) near cul-du-sac.

Directions from Parking to Site: Walk to and then along tree line to stream (around corner house's lot).

Management Issues Noted: Golf course (river right), encroachment, undercutting.

Safety Concerns: Extremely high banks, rusty trash in stream.

Site Summary—"Berm Creek" (unnamed second order) is an extremely entrenched small to medium-sized gravelly sand bedded stream. Wetted width was estimated to be approximately 2 meters (6.6 ft) and bankfull width around 5 meters (16.4 ft). Water depth was estimated to be around 10–50 centimeters (3.9–19.7 in). Bank heights were approximately 0.5 meter (1.6 ft) where floodplains had developed and around 5 to 7 meters (16.4 to 23 ft) high where floodplains have not developed. This stream is extremely entrenched and we could not find a safe way to access the stream bed. The banks were mostly bare (0–30% vegetated) with mosses and grasses being the dominant vegetative cover where present. There are lots of slumped in trees in and around the channel and many additional trees ready to fail. While the bed of the stream was very sandy the banks were red clay. The berm on river left led us to suspect this channel is highly modified and may actually be a highly incised drainage ditch. Area leading to and around potential site were damp.

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-9) because of the safety hazard associated with accessing this highly incised site and due to the fact that this site may have been highly modified (channelized) in the past.

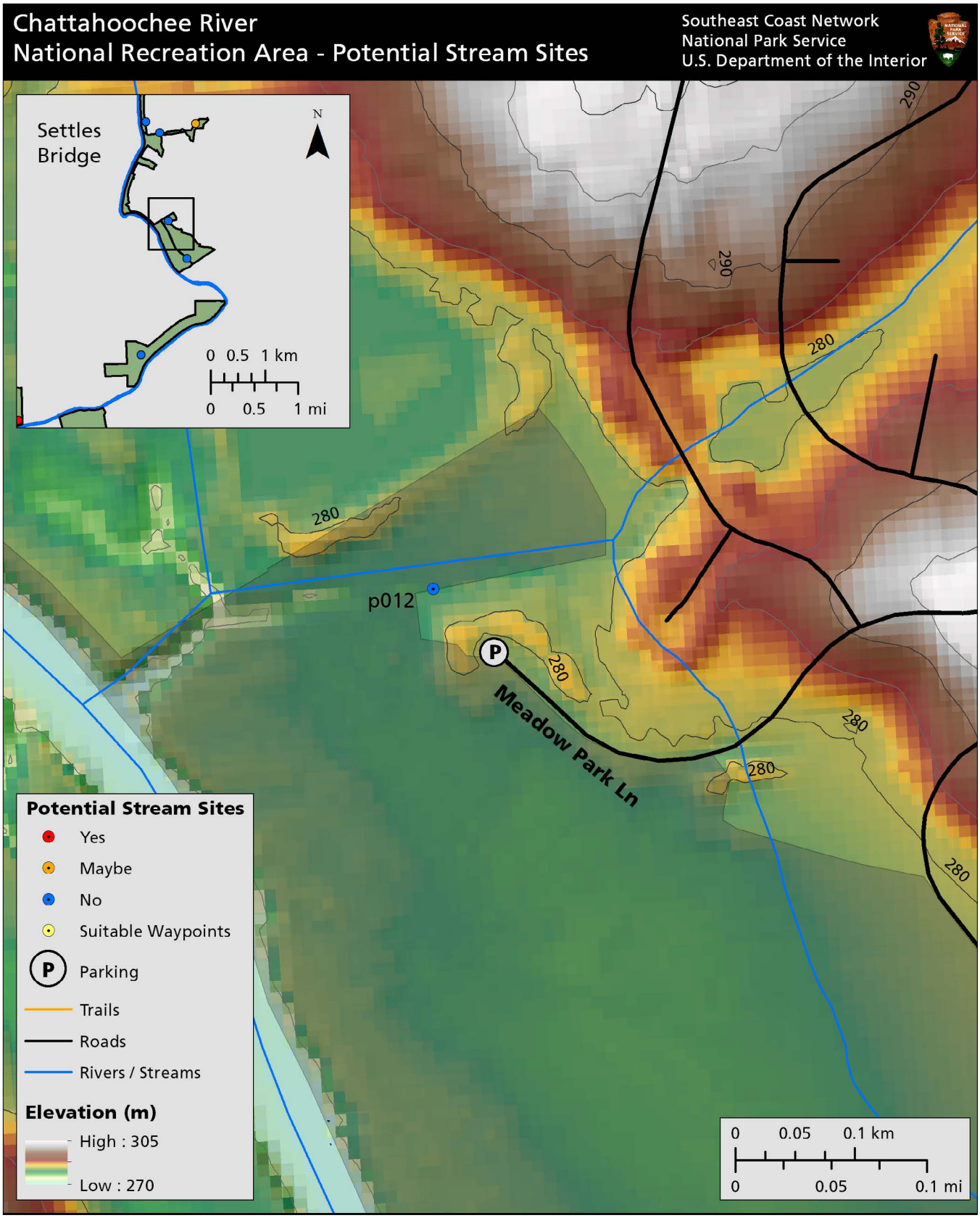


Figure A-9. Map of "Berm Creek" (p010) which flows through the Settles Bridge management unit.



Proposed Site Number: p014

Park Unit: McGinnis Ferry

Stream Name: "Canyon Creek"

Date: 3.15.2017

Time: 9:20 a.m.

Assessed by: JMM and ENS

Accessible: No (high banks)

Gate Key Required: No (Mr. Horne's gate)

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Go through Mr. Horne's gate (7967 Rogers Circle, Johns Creek, GA) and follow dirt/gravel road to corner of park property.

Directions from Parking to Site: From parking spot use GPS to navigate through pines to site.

Management Issues Noted: Extreme entrenchment, gullying.

Safety Concerns: Extremely high walls, undercut banks with large trees.

Site Summary—"Canyon Creek" (unnamed first order) is an extremely entrenched small to medium-sized mucky sand bedded stream (with gravel on exposed bars). Wetted width was estimated to be approximately 1.5 to 2 meters (4.9 to 6.6 ft) and bankfull width around 3 meters (9.8 ft). Water depth was estimated to be around 10–30 centimeters (3.9–11.8 in). Bank heights were approximately 0.75 meter (2.5 ft) where floodplains had developed and around 15 meters (49.2 ft) high where floodplains have not developed. This stream is extremely entrenched and the only safe way to access the stream bed is to use one of the many gullies in the area to navigate back to the stream. Some floodplains have developed within the constraining valley (point bars paired with high steep cutbanks). The banks were either bare and steep or moderately vegetated (up to 50% vegetated) with grasses being the dominant vegetative cover where present. There are lots of slumped in trees in and around the channel and many additional trees ready to fail. There are a lot of very large trees along the stream and the surrounding gullies. The water is discolored (milky green). Point p014knick is a knickpoint in the stream (clay bottomed) that empties into a plunge pool.

Monitoring Recommendation—This site is not recommended for monitoring (Figure A-10) because of the safety hazard associated with accessing this incredibly entrenched stream.

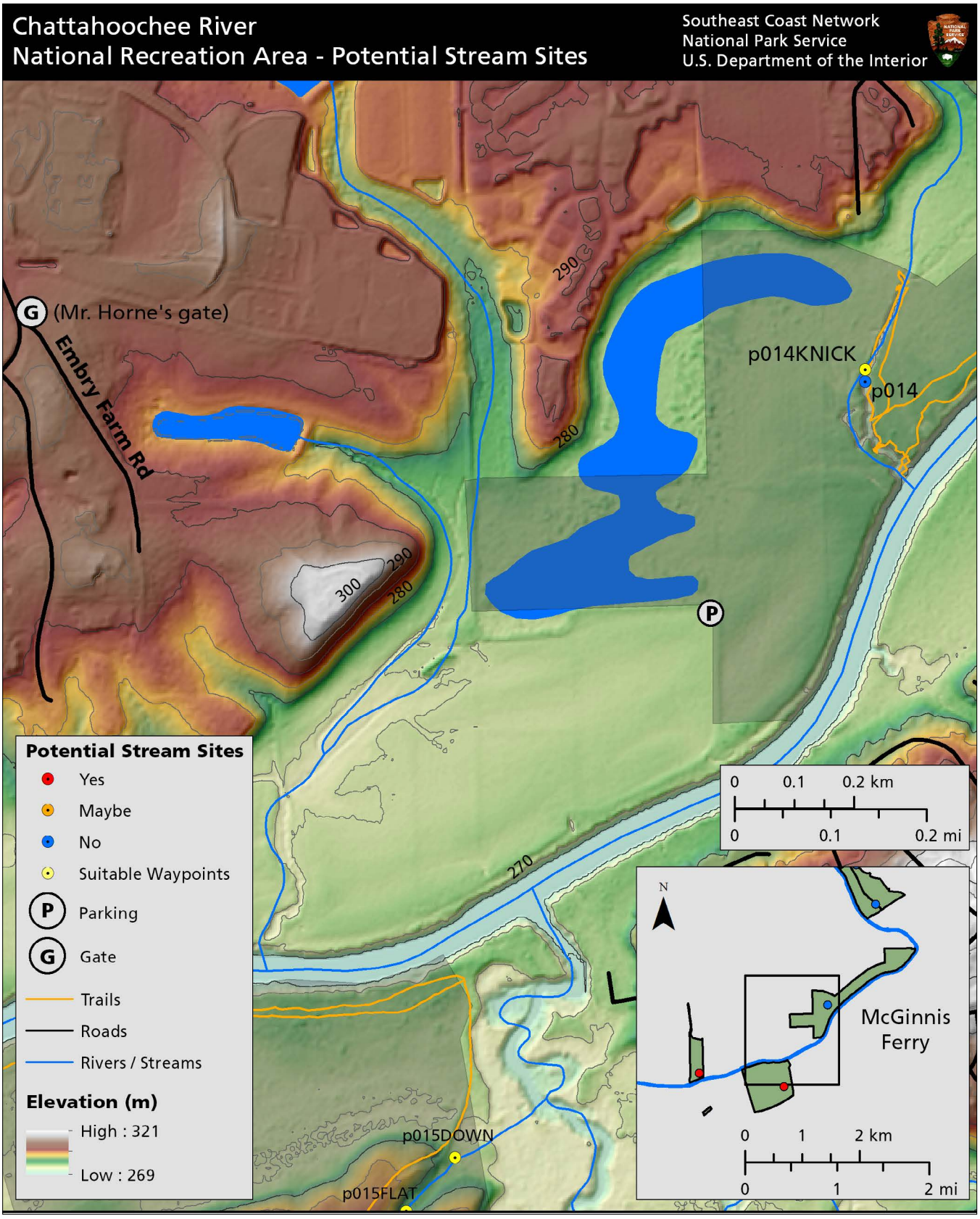


Figure A-10. Map of "Canyon Creek" (p014) which flows through the McGinnis Ferry management unit.



Proposed Site Number: p015

Park Unit: Suwanee Creek

Stream Name: "Three Mind Creek" (CHAT 006)

Date: 3.13.2017

Time: 6:00 p.m.

Assessed by: JMM and ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: End of Chattahoochee Drive (1880 Chattahoochee Drive N.W., Duluth, GA).

Directions from Parking to Site: Park near gate and walk down trail until it levels out on the right.

Management Issues Noted: Undercut banks and slumping.

Safety Concerns: High banks, slippery leaves.

Site Summary—"Three Mind Creek" (unnamed first order) is a small sandy gravel bedded stream that is moderately to highly entrenched near p015, not entrenched downstream near p015flat, and moderately entrenched further downstream near p015down. Wetted width was estimated to be approximately 1 meter (3.3 ft) and bankfull width around 2 to 3 meters (6.6 to 9.8 ft). Water depth was estimated to be around 5–10 centimeters (2–3.9 in). Bank heights were approximately 0.25 to 0.75 meter (0.8 to 2.5 ft) where floodplains had developed and around 2 meters (6.6 ft) high where floodplains have not developed. Some floodplains have developed in all three areas (mostly floodplain near p015flat). The banks were either bare and steep or moderately vegetated (up to 50%) with mosses and leaves being the dominant vegetative cover where present. There are lots of slumped in trees in and around the channel and many additional trees ready to fail. This stream was likely a former bedrock constrained stream and it has cut down to bedrock in a few spots (near p015). A few dry channels lead into the stream (e.g., near p015flat). The strange three part nature of the stream led us to wonder if there used to be small dam in this valley that backfilled and subsequently became entrenched.

Monitoring Recommendation—This site is recommended for monitoring (Figure A-11) because the downstream site (p015down) is representative of similar streams (e.g., p002 and p007) in the park. As an extension of this monitoring, we also propose that additional benchmarks are installed on the other two (unmonitored) portions of this stream to compare the development of the three very different portions of this stream.

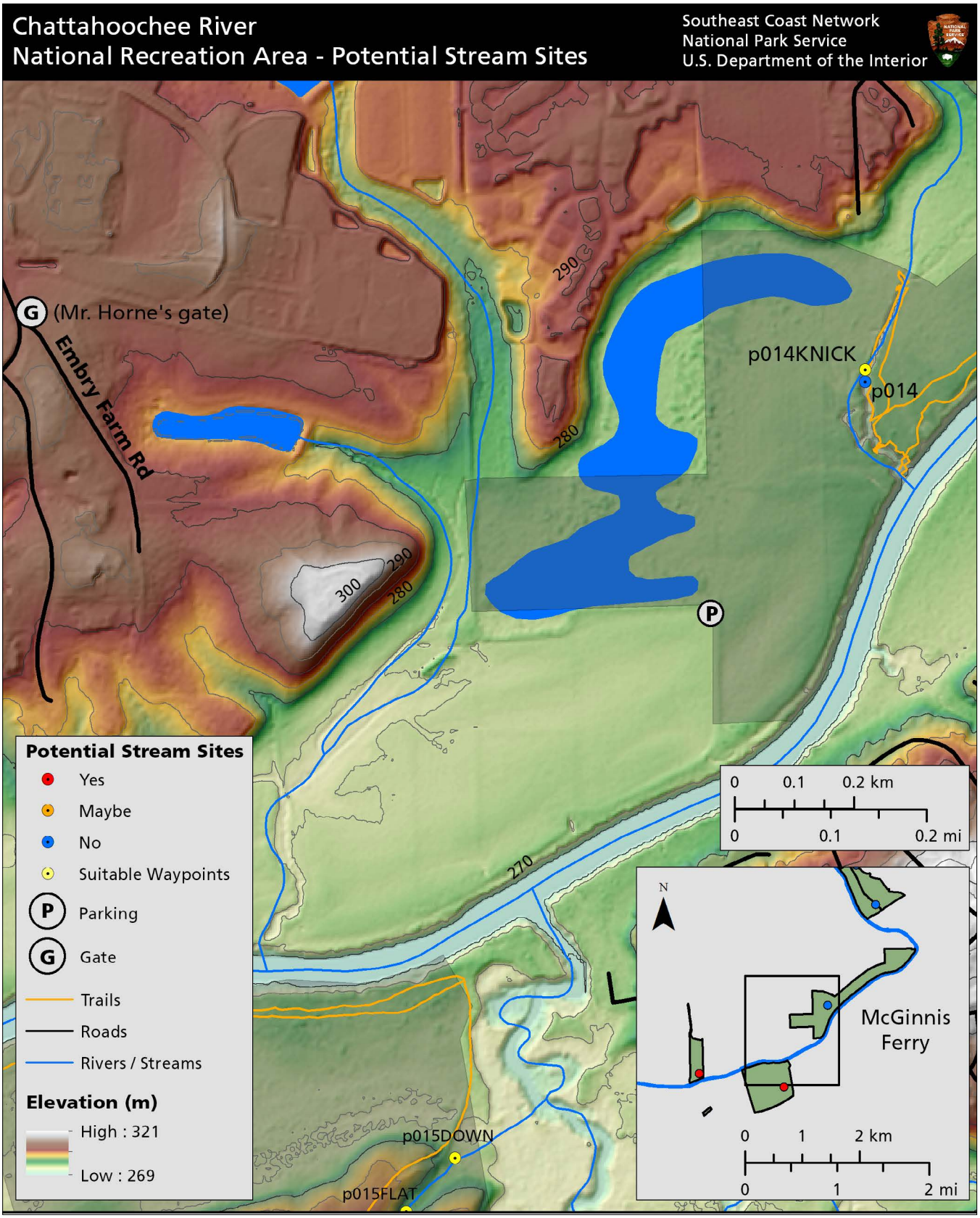


Figure A-11. Map of "Three Mind Creek" (p015) which flows through the Suwanee Creek management unit.



Proposed Site Number: p016

Park Unit: Rogers Bridge

Stream Name: "Red Trail Creek"(CHAT 007)

Date: 3.15.2017

Time: 8:15 a.m.

Assessed by: JMM and ENS

Accessible: Yes

Gate Key Required: No (tumbler code)

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Park at end of Rogers Bridge Road (need code for gate lock).

Directions from Parking to Site: Walk the trail to stream and drop down where safe.

Management Issues Noted: High, undercut, slumping banks.

Safety Concerns: High banks, slumping and falling trees.

Site Summary—"Red Tail Creek" (unnamed first order) is a small sand bedded stream that is moderately to highly entrenched. Wetted width was estimated to be approximately 1.5 meters (4.9 ft) and bankfull width around 2 meters (6.6 ft). Water depth was around 10–15 centimeters (3.9–5.9 in). Bank heights were approximately 0.3 meter (1 ft) where floodplains had developed and around 4 meters (13.1 ft) high where floodplains have not developed. Upstream from p016up the stream is very entrenched and is just a small channel surrounded by 4-meter (13.1-ft) high walls. Some floodplains have developed downstream of p016up. The banks were mostly bare. Large woody debris is influencing the stream through bank protection (some very large trunks are buried). There are a lot of undercut trees ready to fail. There looks like there is potential for the headward migration of floodplain development up the highly entrenched portion of the stream. Based on visual indicators (i.e., undercutting) flood flow is about 2 meters (6.6 ft) above the channel.

Monitoring Recommendation—This site is recommended for monitoring (Figure A-12). Though there are some safety issues with the high banks and undercut trees, this site is the most accessible moderately to highly entrenched stream in the northern portion of the park.

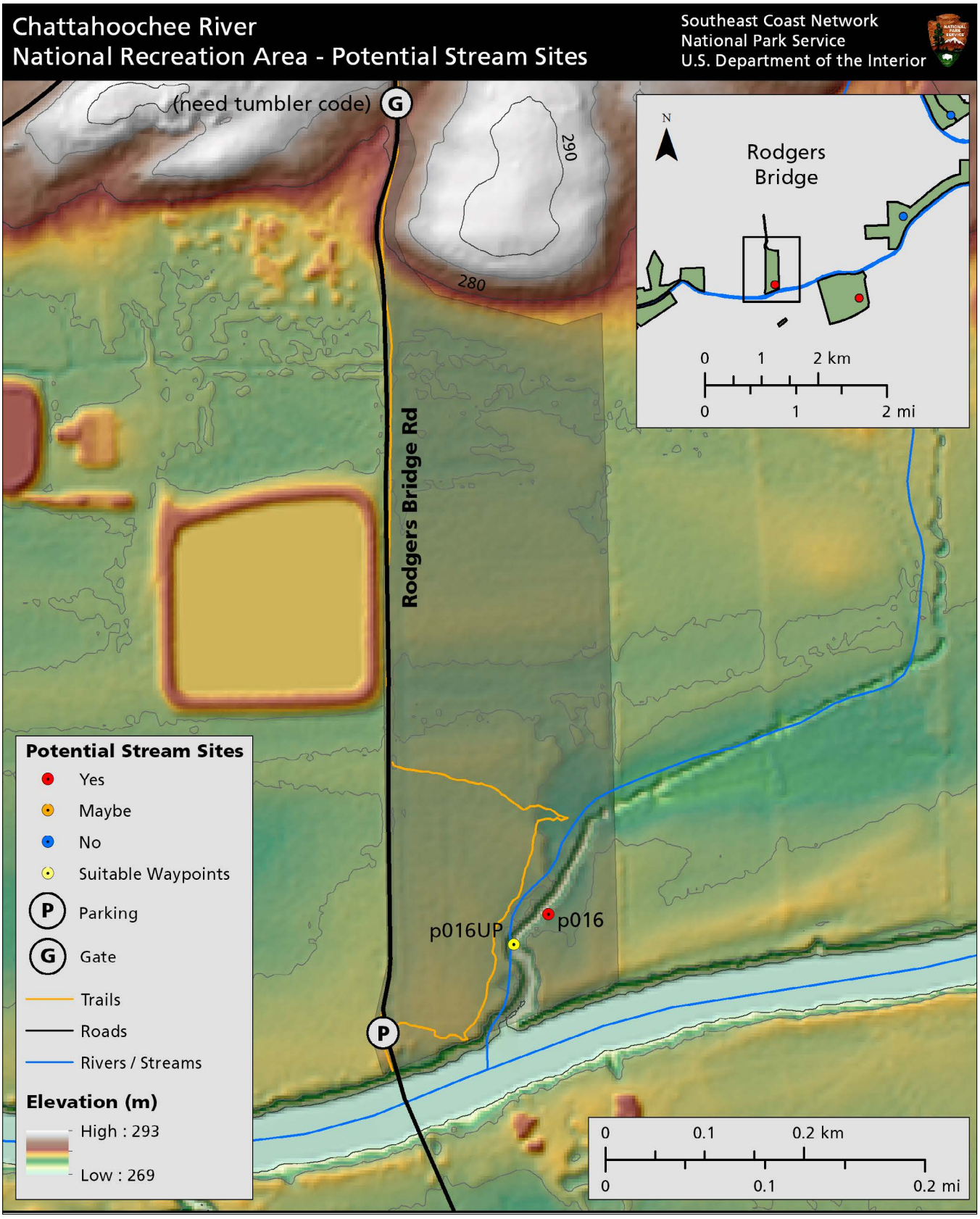


Figure A-12. Map of "Red Tail Creek" (p016) which flows through the Rogers Bridge management unit.



Proposed Site Number: p017

Park Unit: Abbotts Bridge

Stream Name: "Privet Creek"

Date: 3.15.2017

Time: 7:43 a.m.

Assessed by: JMM and ENS

Accessible: Yes/No (high banks)

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Park on Abbotts Bridge Rd. (park after driveway and point west).

Directions from Parking to Site: Walk down pipeline right-of-way to stream.

Management Issues Noted: Culverts upstream (new in good condition).

Safety Concerns: High banks, parking hazard (traffic).

Site Summary—"Privet Creek" (unnamed first order) is a small gravelly sand bedded stream that is moderately to highly entrenched. Wetted width was estimated to be approximately 1.5 meters (4.9 ft) and bankfull width around 4 to 8 meters (13.1 to 26.2 ft). Bankfull width widens substantially near p017 where a wash enters the stream from river left (before returning to entrenched conditions). Water depth was around 5–10 centimeters (2–3.9 in). Bank heights were approximately 0.5 meter (1.6 ft) where floodplains had developed and around 3 meters (9.8 ft) high where floodplains have not developed. Upstream from p017 the stream is moderately to highly entrenched. Some floodplains have developed downstream of p017 where the wash is influencing the stream. The banks were mostly bare (less than 10% vegetated) with mosses and weeds being the dominant vegetative cover where present. Large woody debris becomes important downstream from p017. Gravels/cobbles are present though the bed is mostly sandy and the banks are red clay. There is an interesting gleyed clayey strata at the base of the banks. There is potential for backwater effects from the Chattahoochee downstream but we did not recon due to the relatively impenetrable vegetation.

Monitoring Recommendation—This site is not recommended for monitoring (Figure A-13) due to the difficulty accessing the site (relatively impenetrable vegetation during winter) and high banks.

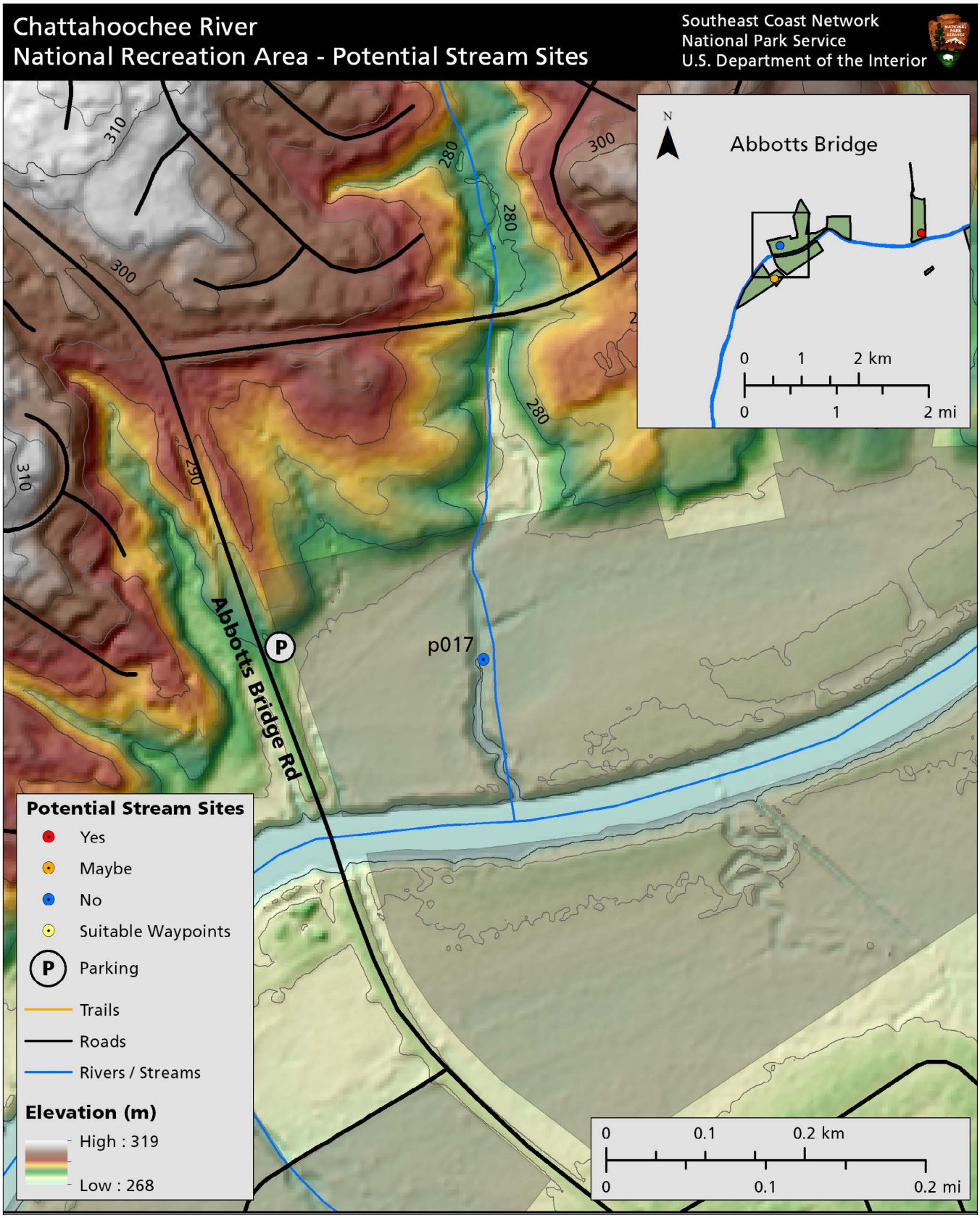


Figure A-13. Map of "Privet Creek" (p017) which flows through the northern portion of the Abbotts Bridge management unit.



Proposed Site Number: p018
Park Unit: Abbotts Bridge
Stream Name: "Briar Creek"
Date: 3.13.2017
Time: 5:11 p.m.
Assessed by: JMM and ENS
Accessible: Yes
Gate Key Required: No
Wadeable: Yes
Recommend for Monitoring: Maybe

Best Point of Access/Parking: Park next to bridge on way to Abbotts Bridge boat landing.

Directions from Parking to Site: Walk upstream along river left to site.

Management Issues Noted: Beaver dam downstream at bridge, slumping banks.

Safety Concerns: High banks, trash.

Site Summary—"Briar Creek" (unnamed first order) is a medium-sized gravelly muck bedded stream. Wetted width was estimated to be approximately 4 meters (13.1 ft) and bankfull width around 7 meters (23 ft). Water depth was around 10–25 centimeters (3.9–9.8 in). Bank heights were approximately 2.5 meters (8.2 ft) where incipient floodplain/slump-cored benches were not present. The stream is moderately entrenched and no floodplains were noted in the survey notes (though this is one of the first streams assessed so notes may not be as complete). The banks were mostly unvegetated (less than 25% vegetated) with grasses, weeds, and shrubs being the dominant vegetative cover where present. Large woody debris is present and p018up is just downstream from a large jam. Banks are very clay-rich and there is significant slumping (mostly on former cutbanks). It appears that undercutting of the banks is creating conditions that cause the slumping and creation of the slump-cored benches/incipient floodplains. A gully is forming near p018 and is head cutting into a drainage channel cut behind the stream. There is a beaver dam downstream of the bridge.

Monitoring Recommendation—This site is potentially recommended for monitoring (Figure A-14) because it would be an interesting case study on how these heavily impacted streams develop through time. It is only classified as maybe because of the thick vegetation (would require significant clearing of briars and privet) and the safety concerns regarding the relatively high, slick, clayey banks.

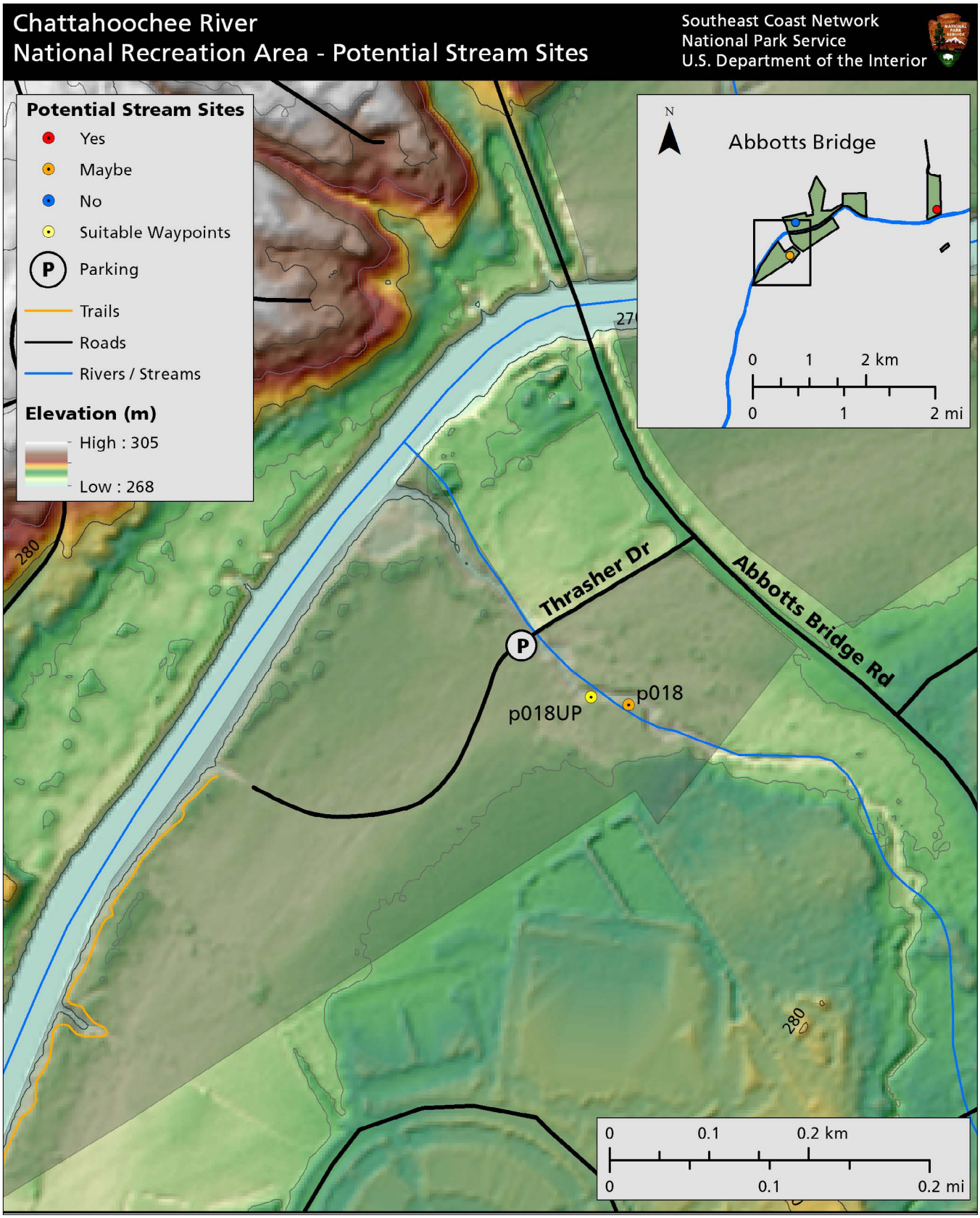


Figure A-14. Map of "Briar Creek" (p018) which flows through the southwestern portion of the Abbotts Bridge management unit.



Proposed Site Number: p019

Park Unit: Holcomb Bridge

Stream Name: Crooked Creek

Date: 3.13.2017

Time: 4:10 p.m.

Assessed by: JMM and ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Small parking spot on River Exchange Rd. near pumping station (approximately 3000 River Exchange Dr., Norcross, GA).

Directions from Parking to Site: Cross road and then cross water line right of way.

Management Issues Noted: Beaver, trash.

Safety Concerns: Trash, open manhole on way to site, busy road crossing near parking.

Site Summary—Crooked Creek is a medium-sized sandy gravel bedded stream. Wetted width was estimated to be approximately 4–5 meters (13.1–16.4 ft) and bankfull width around 15–20 meters (49.2–65.6 ft). Water depth was around 20 centimeters (7.9 in) and one deep pool was estimated to be around 2 meters (6.6 ft) deep. Bank heights were approximately 2 meters (6.6 ft) where floodplains were not present. The stream is moderately entrenched and no floodplains were noted in the survey notes (though this was the first stream assessed so notes may not be as complete). The banks were mostly unvegetated (approximately 25% vegetated) with grasses and shrubs being the dominant vegetative cover where present. Large woody debris is present but its frequency and function were not noted. Banks are red clay and a sandy overburden was noted that was likely from a recent flood event. Large gravel bars were noted and there was obvious beaver activity in the mostly privet-filled out-of-channel area. This unit is located behind the Retreat at River Park Apartments.

Monitoring Recommendation—This site is not recommended for monitoring (Figure A-15) because only one-side of the stream is owned by the park and the presence of deep pools makes the reach potentially unwadeable as specified in the SECN wadeable stream monitoring protocol.

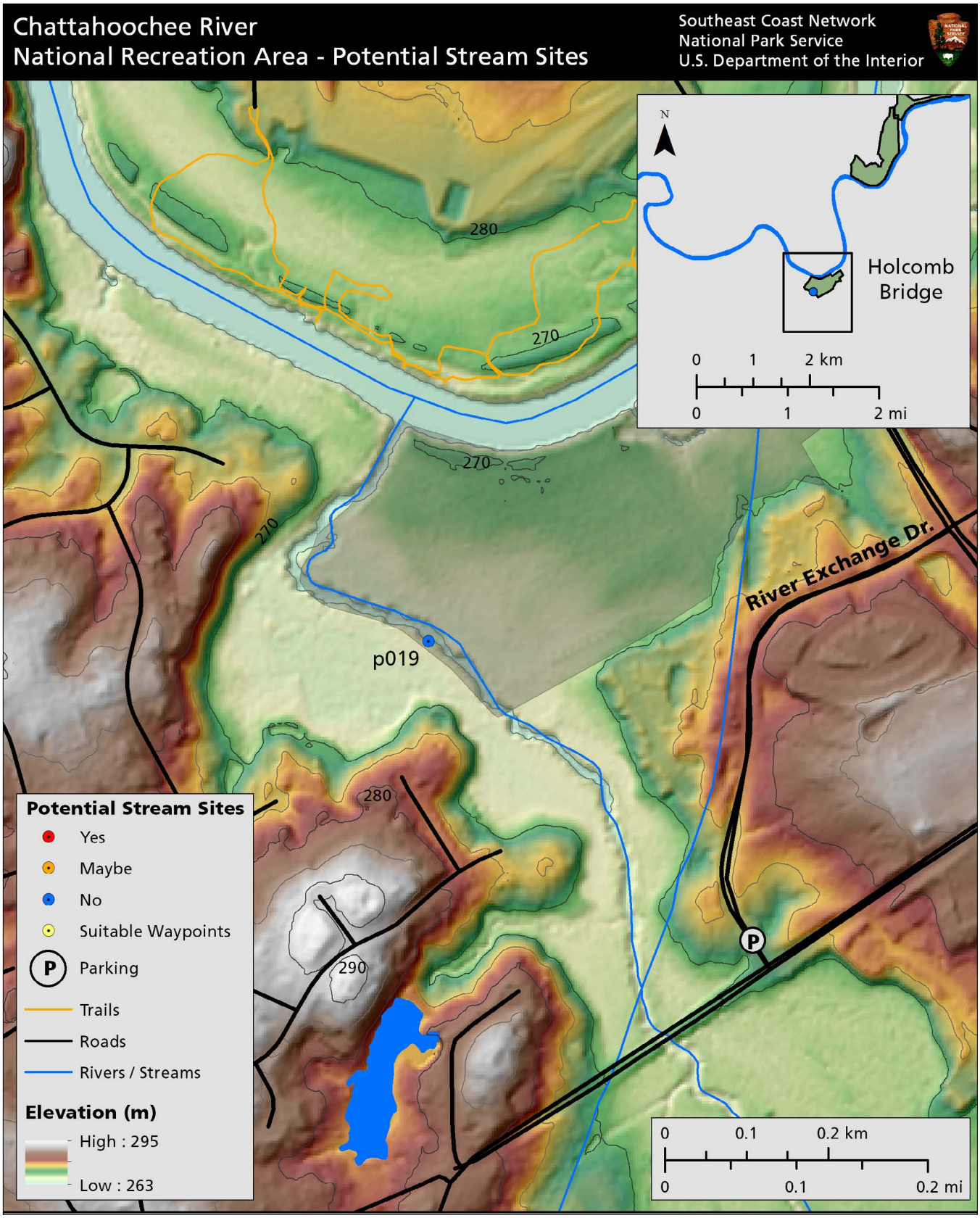


Figure A-15. Map of Crooked Creek (p019) which flows through the Holcomb Bridge management unit.



Proposed Site Number: p020

Park Unit: Vickery Creek

Stream Name: Big Creek

Date: 3.16.2017

Time: 9:29 a.m.

Assessed by: JMM and ENS

Accessible: Yes

Gate Key Required: No

Wadeable: No

Recommend for Monitoring: No

Best Point of Access/Parking: Parking lot off of Riverside Rd.

Directions from Parking to Site: Take social trail to site.

Management Issues Noted: Near relatively busy road, Old Mill site upstream, Trail erosion.

Safety Concerns: Nonwadeable, high banks.

Site Summary—Big Creek is a nonwadeable stream with a large concentration of sand and fines on the channel bed near shore (water was turbid). Wetted width was estimated to be approximately 15 meters (49.2 ft) and bankfull width around 25 meters (82 ft). Water depth could not be determined due to the turbid water. Bank heights were approximately 3–4 meters (9.8–13.1 ft). The stream is moderately entrenched and a floodplain was noted on river right across from the parking lot. The banks were sparsely vegetated (20–40%) with grasses, English ivy, and shrubs being the dominant vegetative cover where present. Large woody debris is present and many of the pieces are just breaching the water's surface. Some boulders or possibly stones from mill site have made a bar on river right just upstream of parking lot. There are social trails that parallel the stream on river left (used to access site).

Monitoring Recommendation—This site is not recommended for monitoring (Figure A-16) because it is not wadeable.

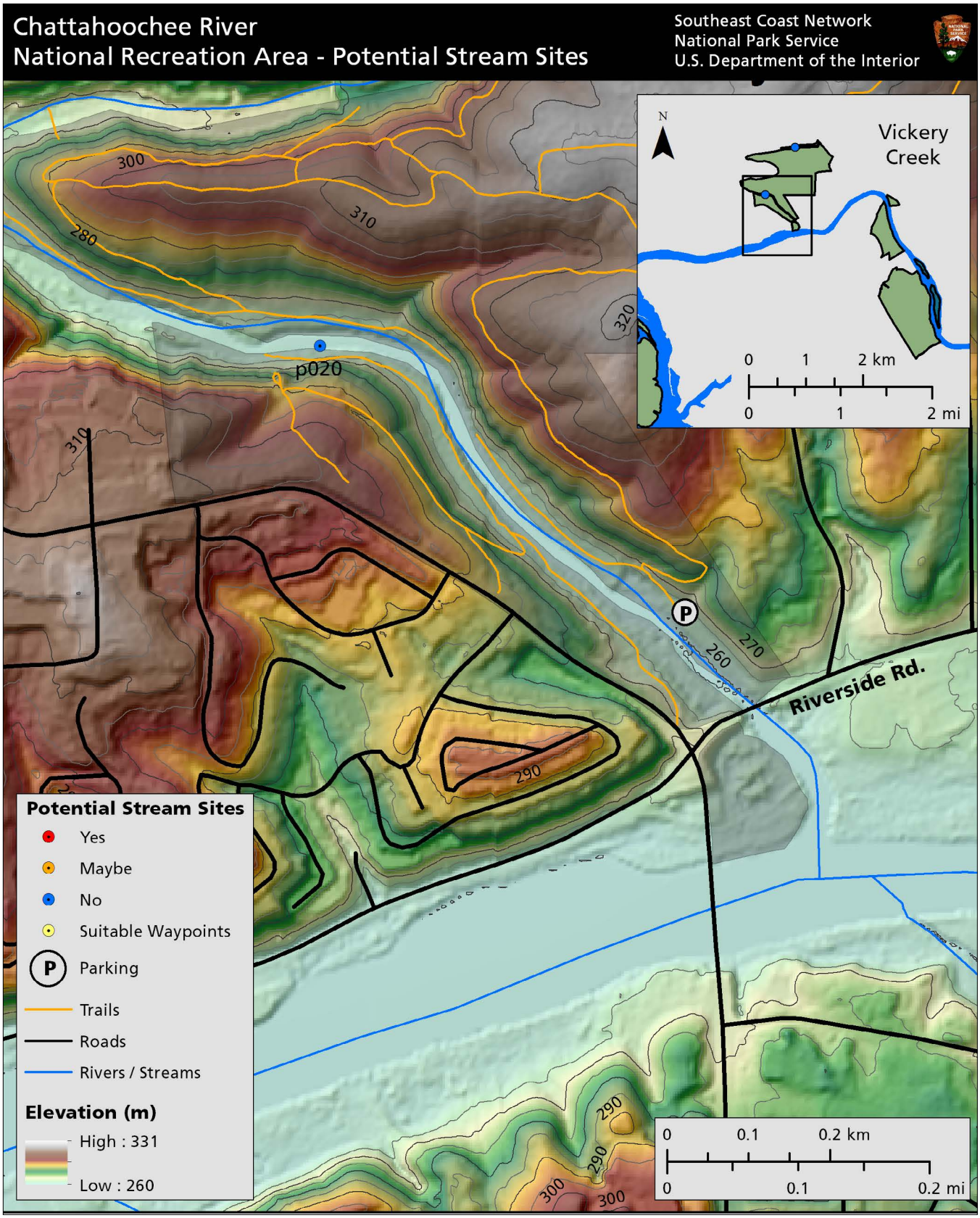


Figure A-16. Map of Big Creek (p020) which flows through the Vickery Creek management unit.



Proposed Site Number: p022

Park Unit: Gold Branch

Stream Name: "Underflow Creek"

Date: 3.14.2017

Time: 6:50 p.m.

Assessed by: JMM and ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Maybe/No

Best Point of Access/Parking: Gold Branch parking lot.

Directions from Parking to Site: Take trail down to bridge and then follow stream down.

Management Issues Noted: Bridge upstream, pumping station.

Safety Concerns: Dead limbs, eroded holes in floodplain.

Site Summary—"Underflow Creek" (unnamed first order) is a small sand bedded stream. Wetted width was estimated to be approximately 1 meter (3.3 ft) and bankfull width around 2.5 meters (8.2 ft). Water depth was around 10 centimeters (3.9 in). Bank heights were approximately 0.25 meter (0.8 ft). Initial assessment of the creek classified the entrenchment of the segment as low. The stream is on the left side (looking downstream) of a flat valley bottom. There are multiple side channels that increase in size downstream. The banks were sparsely to moderately vegetated (20–40%) with mosses, ferns, and privet being the dominant vegetation where present. Large woody debris is present but no function was recorded. Further downstream from p022mid, the valley bottom shows obvious signs of the reservoir's impact on raising groundwater levels, swamping the floodplain and killing relatively large trees. At point p022under, the part of the flow from the main channel is being diverted into a side channel by (natural) piping.

Monitoring Recommendation— This site is potentially recommended for monitoring (Figure A-17). The flat relatively wide valley bottom places this stream in a unique (for the park) setting and the very low degree of entrenchment also makes this stream unique. This stream is not a prime contender for monitoring because of the confusing multi-channel nature of the drainage.

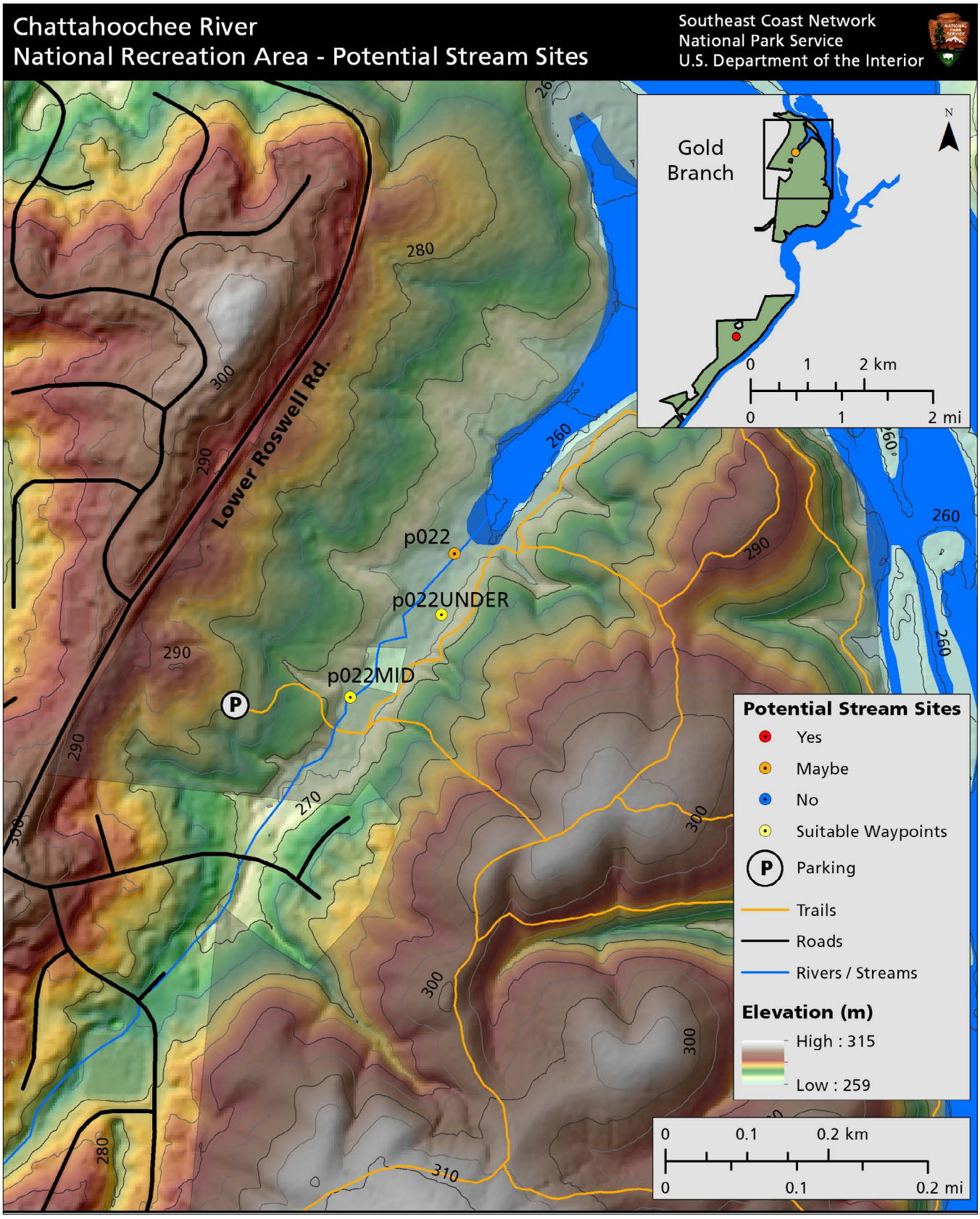


Figure A-17. Map of "Underflow Creek" (p022) which flows through the Gold Branch management unit.



Proposed Site Number: p023

Park Unit: Johnson Ferry

Stream Name: Mulberry Creek (CHAT 008)

Date: 3.16.2017

Time: 10:32 a.m.

Assessed by: JMM and Adjacent landowner

Accessible: Yes

Gate Key Required: Yes (NPS)

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Parking on top of hill at the end of the pavement near Hyde Farm (Hyde Road N.E.). Contact park staff prior to trying to access.

Directions from Parking to Site: Walk down hill to site ~0.15 – 0.25 miles.

Management Issues Noted: Sewer line (Cobb county clearing right-of-way).

Safety Concerns: Falling trees/limbs (not major), steep trek in.

Site Summary—Mulberry Creek is a small gravelly, sandy, cobble bedded stream. Wetted width was estimated to be approximately 2 meters (6.6 ft) and bankfull width around 8 meters (26.2 ft). Water depth was around 5–10 centimeters (2–3.9 in). Bank heights were approximately 0.5 meter (1.6 ft) where floodplains have developed and 1.5 meters (4.9 ft) where the stream is cutting into the historical terrace. Initial assessment of the creek classified the entrenchment of the segment as moderate to low. Floodplains have developed and are often paired with higher undercut cutbanks. The banks were either bare (cutbanks) or moderately vegetated (up to 60%) with mosses, grasses, and ferns being the dominant vegetation where present. Large woody debris is present and there are quite a few areas that trees are being undercut and are ready to fail. There are a few areas that bedrock is extruding into the channel (at upstream confluence and between proposed sites). The point bars are composed primarily of cobbles and gravel and there are significant concentrations of fine sediment in the lower energy areas. Adjacent landowner noted the stream is progressively widening and the rate has been increasing during the past 20 years.

Monitoring Recommendation— This site is recommended for monitoring (Figure A-18). This stream is a good example of a well-developed floodplain and the land cover in the watershed is not likely to change. There is concern regarding the steep trek to the site and the uncertain access via private land.

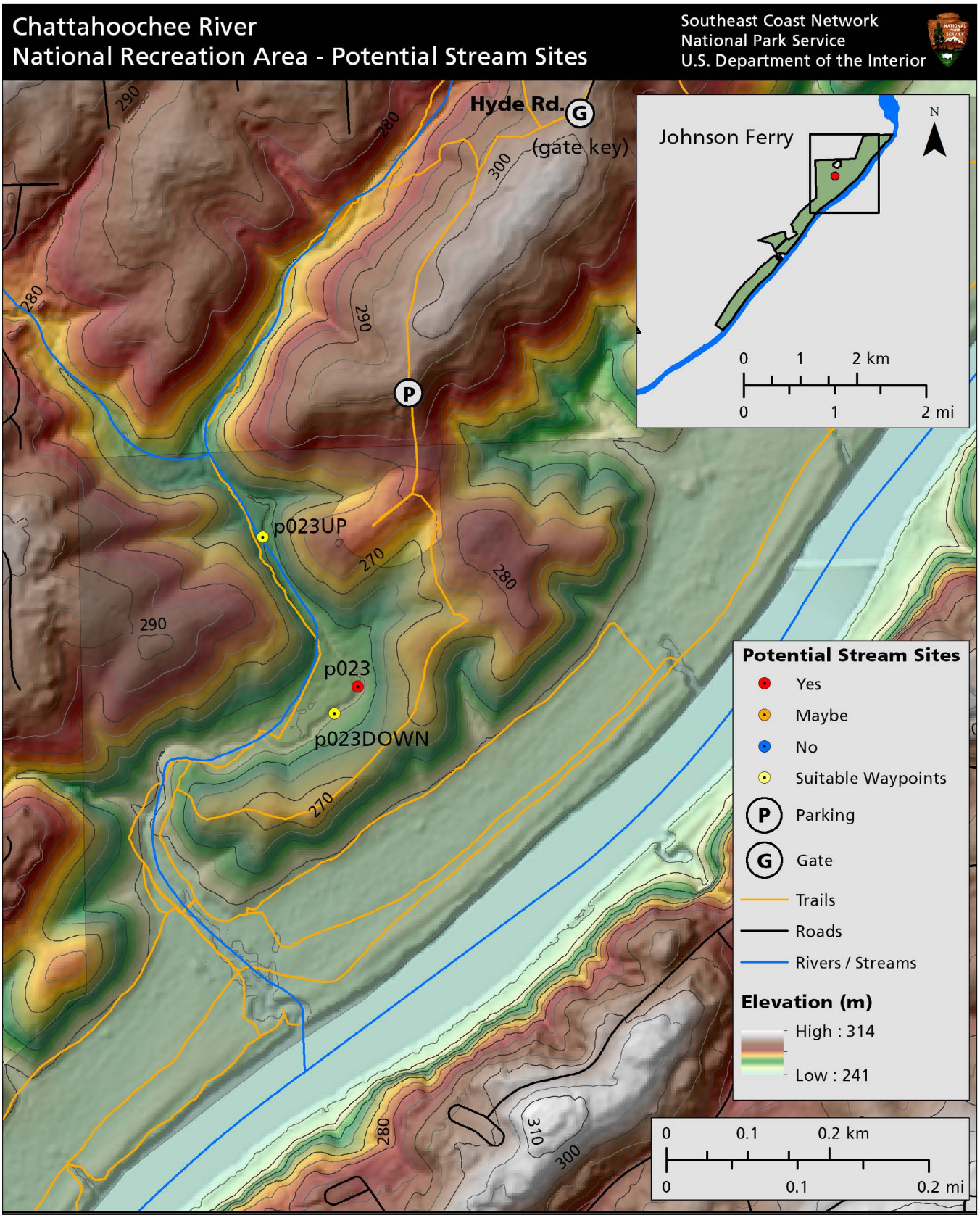


Figure A-18. Map of Mulberry Creek (p023) which flows through the Johnson Ferry management unit.



Proposed Site Number: p024

Park Unit: Cochran Shoals

Stream Name: Sope Creek

Date: 3.14.2017

Time: 11:52 a.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Park at Sope Creek lot.

Directions from Parking to Site: Take trails down to stream.

Management Issues Noted: Historical structures on river left, bridge upstream

Safety Concerns: High velocity stream, slippery rocks, potential for deep pools, flash flood potential, falling rocks.

Site Summary—Sope Creek is a large boulder and bedrock bottomed stream. This stream is bedrock controlled and has historical structures (stone walls) on river left. Wetted width was estimated to be approximately 20 to 25 meters (65.6 to 82 ft) and bankfull width around 30 to 40 meters (98.4 to 131.2 ft). Water depth was estimated to be around 20 to 50 centimeters (7.9 to 19.7 in). Bank heights were approximately 0.5 to 1 meter (1.6 to 3.3 ft) where small pockets of floodplain have developed. Initial assessment of the creek classified the entrenchment of the segment as low. Floodplains have developed on the edges of the channel where the bedrock is not constricting the channel. The banks were relatively well vegetated (50–80%) with mosses and grasses being the dominant vegetation where present. No large woody debris was recorded on the field notes.

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-19) because it is bedrock controlled, the presences of historical structures on river left, and due to the safety hazards associated with surveying the site.

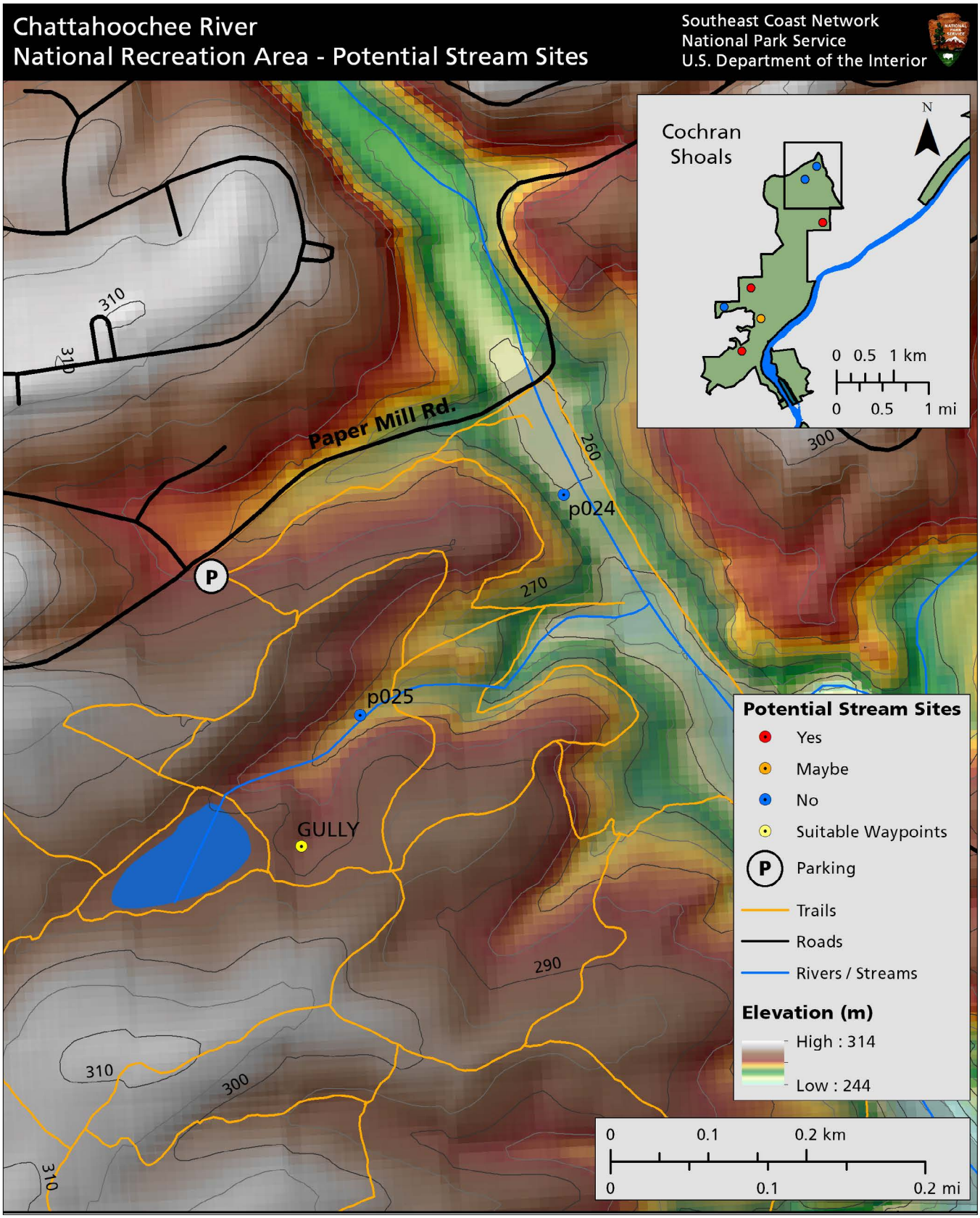


Figure A-19. Map of Sope Creek (p024) and "Gully Creek" (p025) which flow through the Cochran Shoals management unit.



Proposed Site Number: p025

Park Unit: Cochran Shoals

Stream Name: **"**Gully Creek"

Date: 3.14.2017

Time: 11:31 a.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Sope Creek parking lot.

Directions from Parking to Site: Walk trail down to pond and then follow gullies down to site.

Management Issues Noted: Upstream gully headcutting towards pond. Potential for pond damn failure.

Safety Concerns: Slippery leaves and potential for failing pond upstream.

Site Summary—"Gully Creek" (unnamed first order) is a very small cobbly sand bedded stream. The bed of the stream was likely originally composed of primarily cobble-sized flat rocks that are now covered in sand. Wetted width was measured to be approximately 0.5 meter (1.6 ft) and bankfull width around 2 meters (6.6 ft). Water depth was around 5 centimeters (2 in). Bank heights were approximately 0.25 meter (0.8 ft). Initial assessment of the creek classified the entrenchment of the segment as low. This stream is largely hillslope controlled/influenced especially on river right. The banks were relatively well covered (75–90% vegetated) with leaves and moss being the dominant cover. Large woody debris is providing a lot of habitat complexity. Leaves are covering the majority of the surfaces and the downstream culvert is plugged. Based on the amount of flow, it is doubtful this stream would flow during the height of summer if not feed by the upstream pond. There is significant gullying upstream leading to the pond. The main gully (being fed) by pond overflow is in danger of headcutting into the dam, which could cause dam to fail.

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-20) because it is too small (doesn't have clearly defined banks) and discharge is controlled by outflow from the upstream pond. We do recommend monitoring the large gully upstream as it may cause the dam to fail.

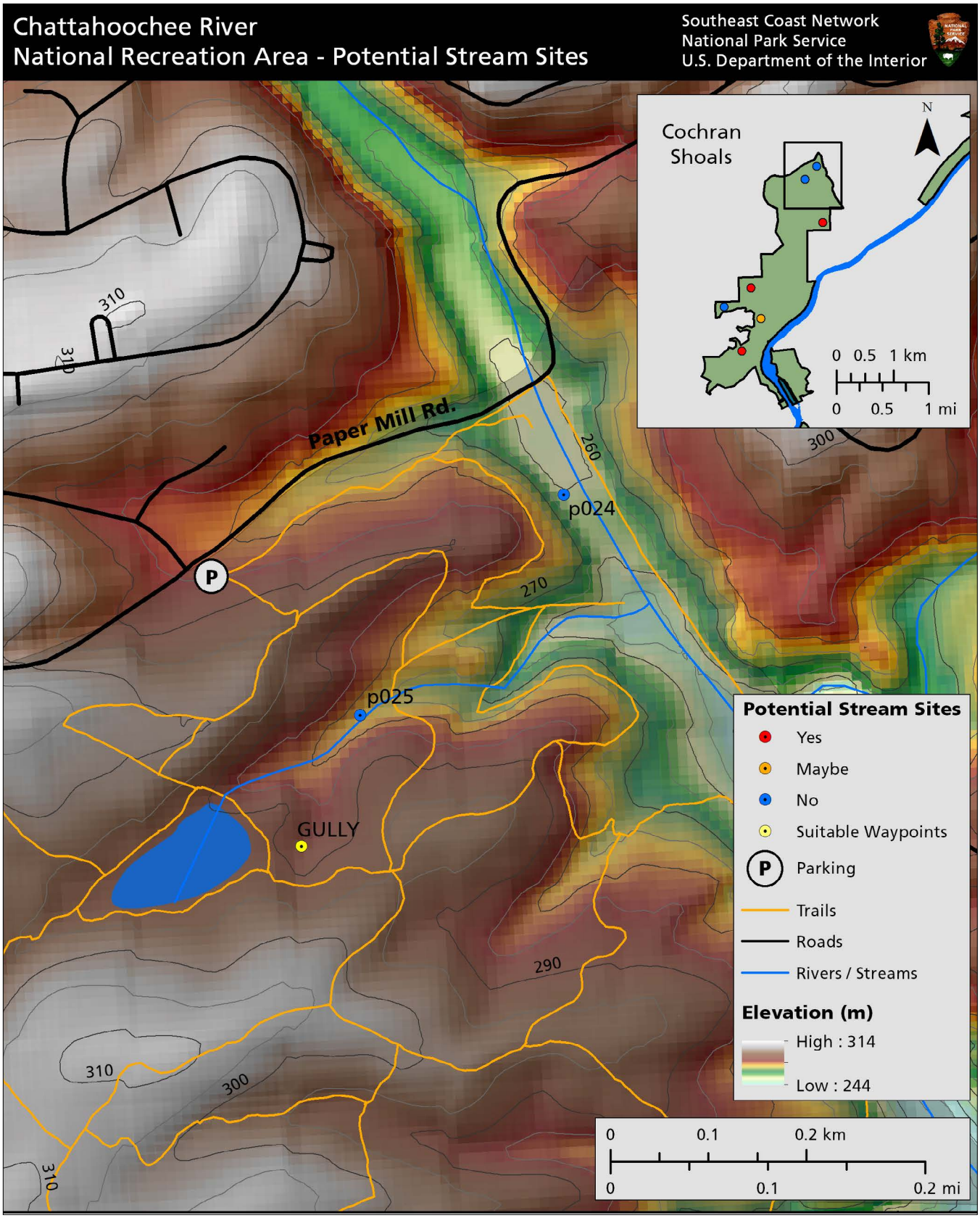


Figure A-20. Map of Sope Creek (p024) and "Gully Creek" (p025) which flow through the Cochran Shoals management unit.



Proposed Site Number: p026

Park Unit: Cochran Shoals

Stream Name: Fox Creek (CHAT 008)

Date: 3.14.2017

Time: 10:47 a.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Park at end of River Heights Crossing S.E. (3428 River Heights Crossing S.E., Marietta, GA).

Directions from Parking to Site: Private parking spot at head of trail, walk downslope to site.

Management Issues Noted: Lots of undercutting, trash.

Safety Concerns: Lots of undercut overhanging trees ready to fail.

Site Summary—Fox Creek is a small gravelly sand bedded stream. Wetted width was estimated to be approximately 1 to 2 meters (3.3 to 6.6 ft) and bankfull width around 4 meters (13.1 ft). Water depth was estimated to be around 10 centimeters (3.9 in). Bank heights were approximately 1 meter (3.3 ft). Initial assessment of the creek classified the entrenchment of the segment as low. This segment is relatively homogeneous and some floodplain has developed. Most of the out-of-channel area is slightly higher historical terrace. The banks were moderately vegetated (approximately 50%) with leaves and moss being the dominant cover. Large woody debris is providing a lot of habitat complexity. There is significant undercutting throughout the segment (especially on cutbanks and under overhanging trees). Banks are clayey and mostly bare on cutbanks. There are a number of hillslope drainages coming into the stream (e.g., near p026down). Point p026cut is on river left across from a relatively recent neck cutoff.

Monitoring Recommendation— This site is recommended for monitoring (Figure A-21) because of the change that is expected to occur due to the undercut banks and because of the large amount of use this stream gets from the surrounding communities.

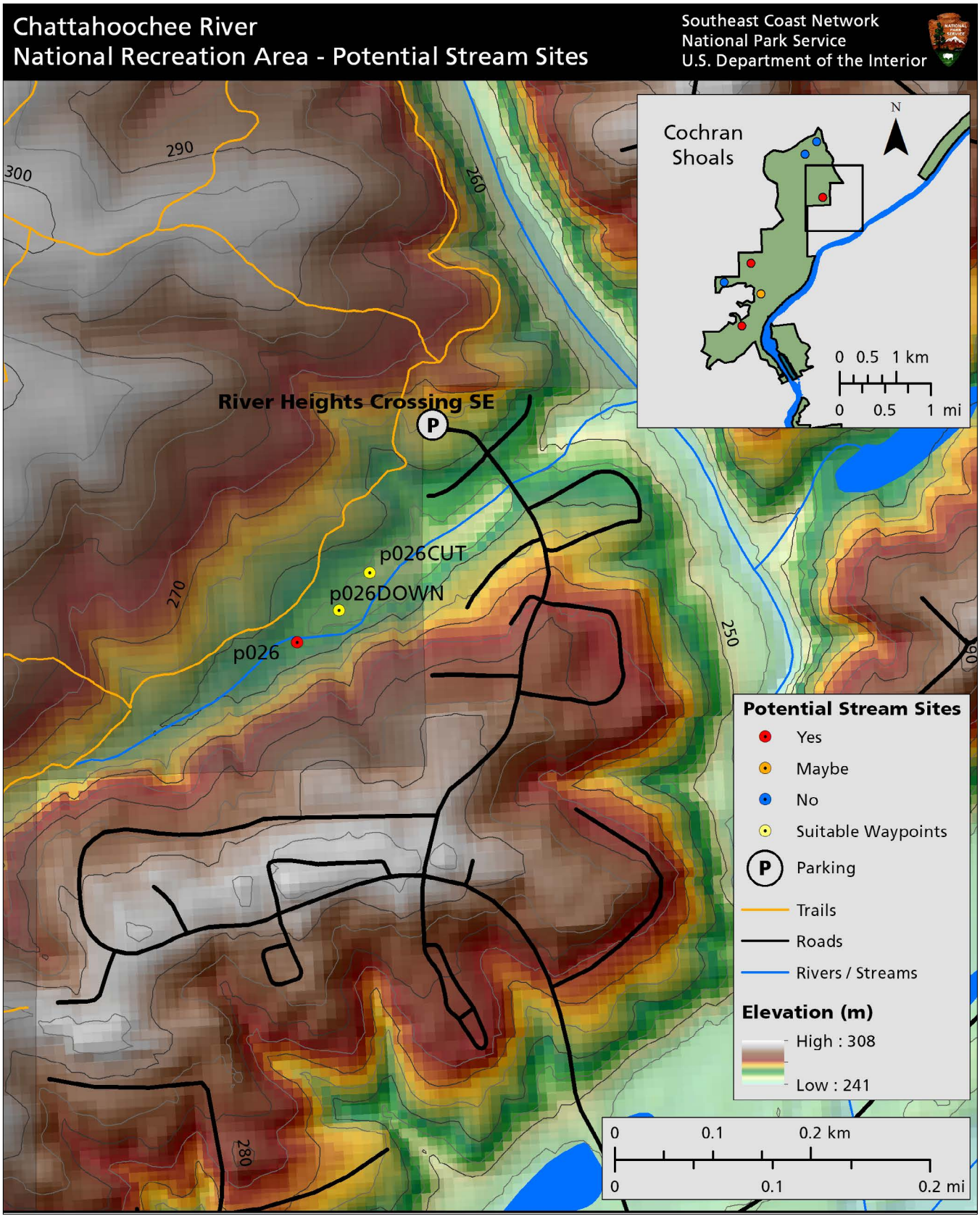


Figure A-21. Map of Fox Creek (p026) which flows through the Cochran Shoals management unit.



Proposed Site Number: p027

Park Unit: Cochran Shoals

Stream Name: **"**Beaver Creek" (CHAT 010)

Date: 3.14.2017

Time: 8:40 a.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: Yes (NPS)

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Park at bridge below p029 (need key to access trail).

Directions from Parking to Site: Walk up trail and take a right at the Y.

Management Issues Noted: Beaver dams downstream, trash, bed fining.

Safety Concerns: Beaver dams, trash , slippery cutbanks, deep pools

Site Summary—"Beaver Creek" (unnamed first order) is a medium-sized cobbly sand bedded stream. There is a lot of fine material on the bed of the stream showing evidence of the upstream urbanization. Wetted width was estimated to be approximately 3 meters (9.8 ft) and bankfull width around 7–8 meters (23–26.2 ft). Water depth was estimated to be around 10–30 centimeters (3.9–11.8 in). Bank heights were approximately 0.5 meter (1.6 ft) where floodplains have developed and around 1.5 meters (4.9 ft) high where the stream is cutting into the historical terrace. Initial assessment of the creek classified the entrenchment of the segment as moderate to low. The banks were mostly bare on the cutbank sides of the stream and moderately covered (50–75% vegetated) with leaves, mosses, and grass being the dominant cover. Large woody debris is present and serving multiple functions (e.g., trapping trash close to p027up). Stream banks are being undercut on cutbanks as well as in the straight reaches. There are a lot of exposed roots and undercut overhanging trees along this segment. Beaver have dammed up the bottom portion of this stream near where it joins the stream draining p028. Bedrock was noted upstream of p027up.

Monitoring Recommendation— This site is recommended for monitoring (Figure A-22) because of the influences (additions of fine bed material) from the upstream development that were observed.

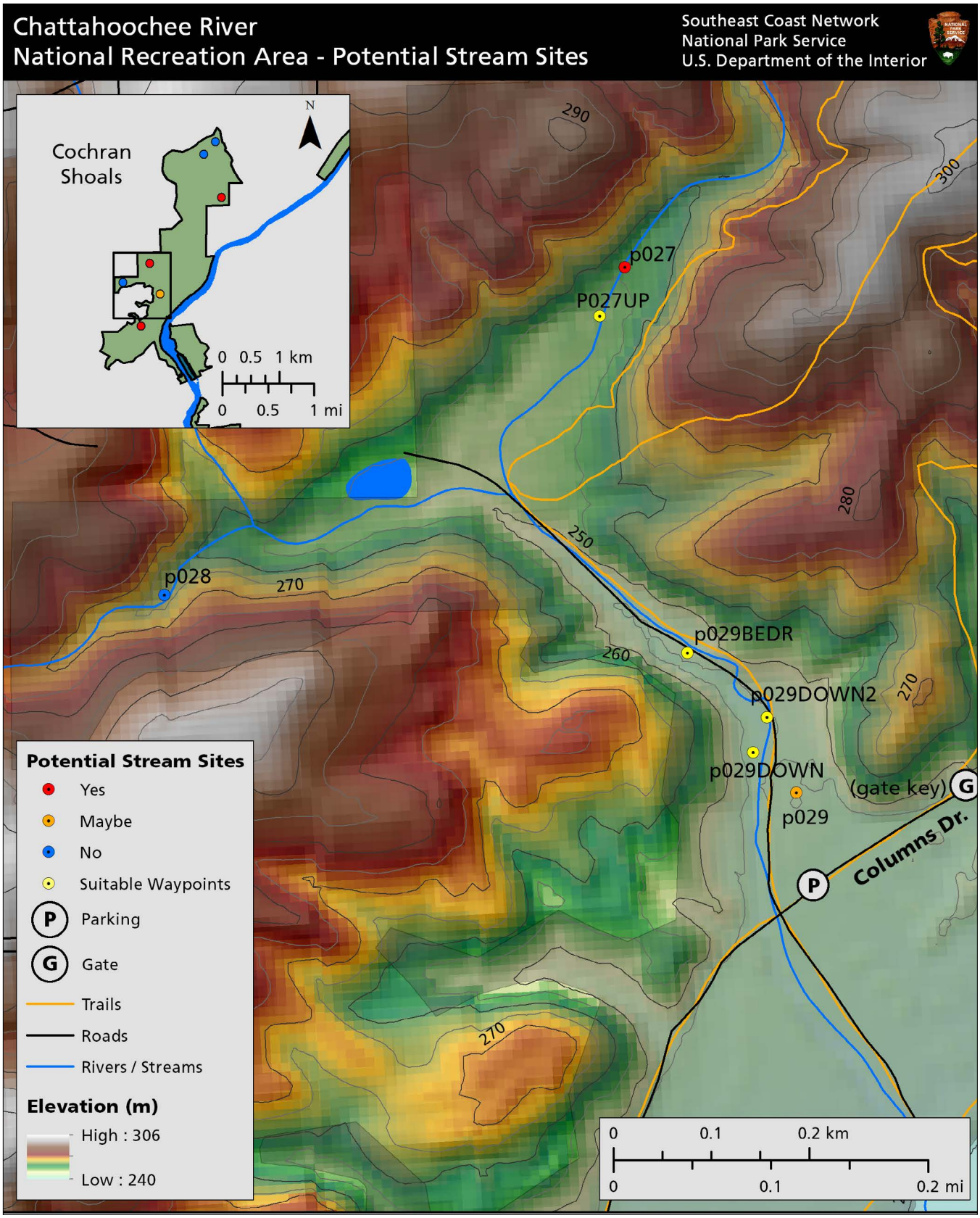


Figure A-22. Map of "Beaver Creek" (p027), "Diversion Creek" (p028), and Terrell Mill Creek (p029) which flow through the Cochran Shoals management unit.



Proposed Site Number: p028

Park Unit: Cochran Shoals

Stream Name: **"**Diversion Creek"

Date: 3.14.2017

Time: 9:08 a.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: Yes (NPS)

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Park at bridge below p029 (need key to access trail).

Directions from Parking to Site: Walk up trail and take a left at the Y.

Management Issues Noted: Private pond diversion downstream.

Safety Concerns: Bedrock reach.

Site Summary—"Diversion Creek" (unnamed first order) is a medium-sized gravelly sand bedrock bottomed stream. Mostly bedrock bottomed though sand and gravel are present in the lower energy areas. Wetted width was estimated to be approximately 2–5 meters (6.6–16.4 ft) and bankfull width around 5 meters (16.4 ft). Water depth was estimated to be around 20–30 centimeters (7.9–11.8 in). Bank heights were approximately 2 meters (6.6 ft). Initial assessment of the creek classified the entrenchment of the segment as moderate to high. The banks were bedrock and bare. Large woody debris is present and in multiple spots is spanning the reach. Relief rapidly increases as the stream gets more and more influenced by the bedrock outcropping in the area. A sewer drain was on river left near p028. Downstream from p028, the stream is being diverted into a private pond.

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-23) because it is bedrock controlled.

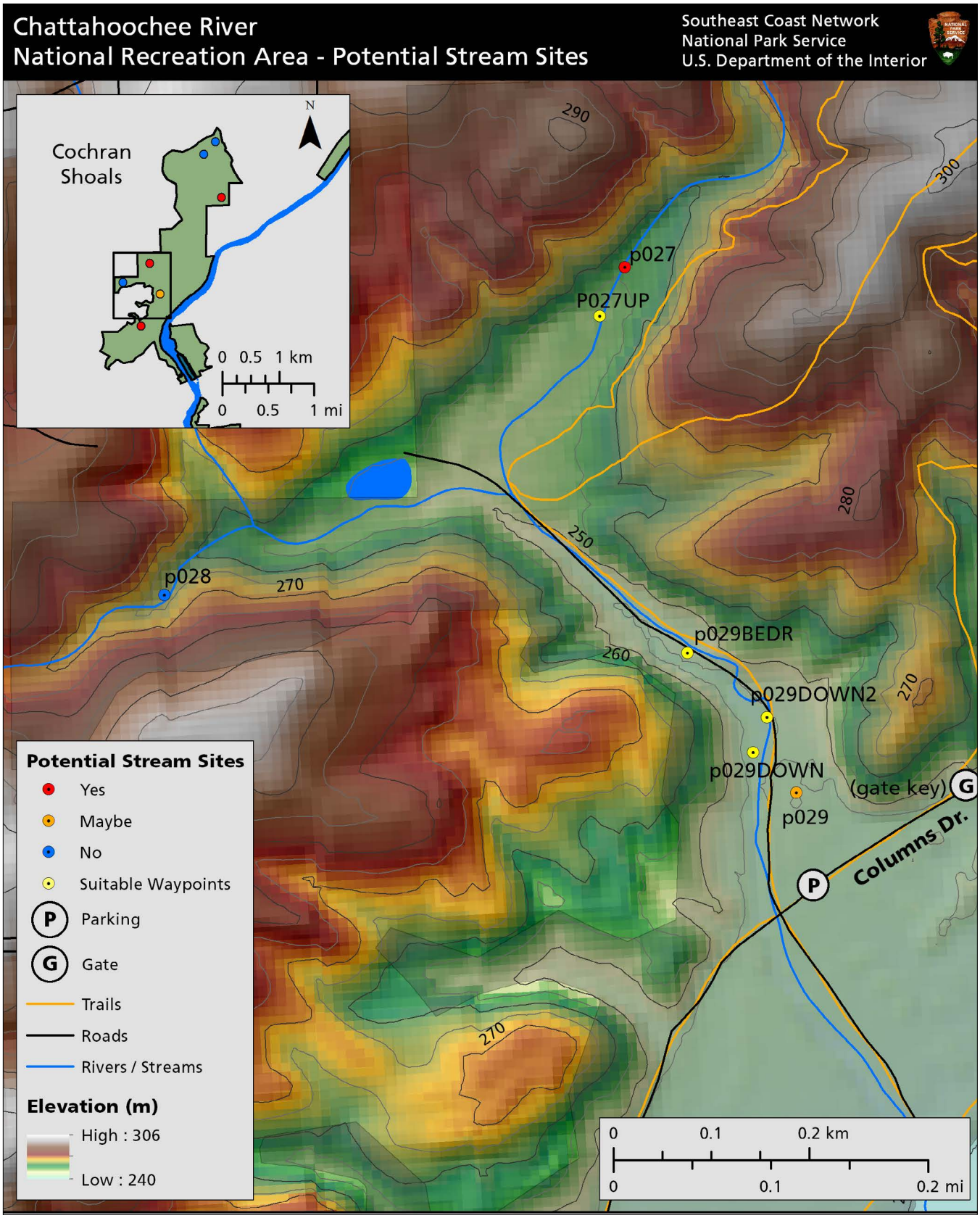


Figure A-23. Map of "Beaver Creek" (p027), "Diversion Creek" (p028), and Terrell Mill Creek (p029) which flow through the Cochran Shoals management unit.



Proposed Site Number: p029

Park Unit: Cochran Shoals

Stream Name: Terrell Mill Creek

Date: 3.14.2017

Time: 8:30 a.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: Yes (NPS)

Wadeable: Yes

Recommend for Monitoring: Maybe

Best Point of Access/Parking: Park at bridge below p029 (need key to access trail).

Directions from Parking to Site: Walk up trail and drop into stream just upstream from bedrock.

Management Issues Noted: Drainage pipe on river left, social trails.

Safety Concerns: Steep bank entering, debris jams.

Site Summary—Terrell Mill Creek is a medium-sized sandy gravel bedded stream. Wetted width was estimated to be approximately 2 meters (6.6 ft) and bankfull width around 6–10 meters (19.7–32.8 ft). Water depth was estimated to be around 10–20 centimeters (3.9–7.9 in). Bank heights were approximately 1–2 meters (3.3–6.6 ft). Initial assessment of the creek classified the entrenchment of the segment as moderate to low. The banks were moderately vegetated (50–75%) with mosses and grasses being the dominant vegetation where present. Some of the floodplain areas and most of the historical terrace is covered in privet. Large woody debris is present and serving multiple functions (e.g., jam in stream near p029down2). River right bank near p029 is sheer and very high and would be difficult to survey (which is why new proposed site is upstream). Additionally, bedrock extrudes into channel between p029 and p029down. The cobble and gravel bars have become partially vegetated. A rip rap wall was observed on river left protecting the historical terrace. Point p029bedr denotes where there is another section of bedrock influencing the creek.

Monitoring Recommendation— This site is potentially recommended for monitoring (Figure A-24) because of its proximity to well used trails and because it is representative of medium-sized streams in the southern portion of the park. There is concern that there is not a long enough reach that is not bedrock constrained. Additionally, the upstream impoundments (beaver [see p027] and man-made [see p028]) are likely trapping sediment that reduces the responsiveness of this segment to additions of sediment derived from upstream development.

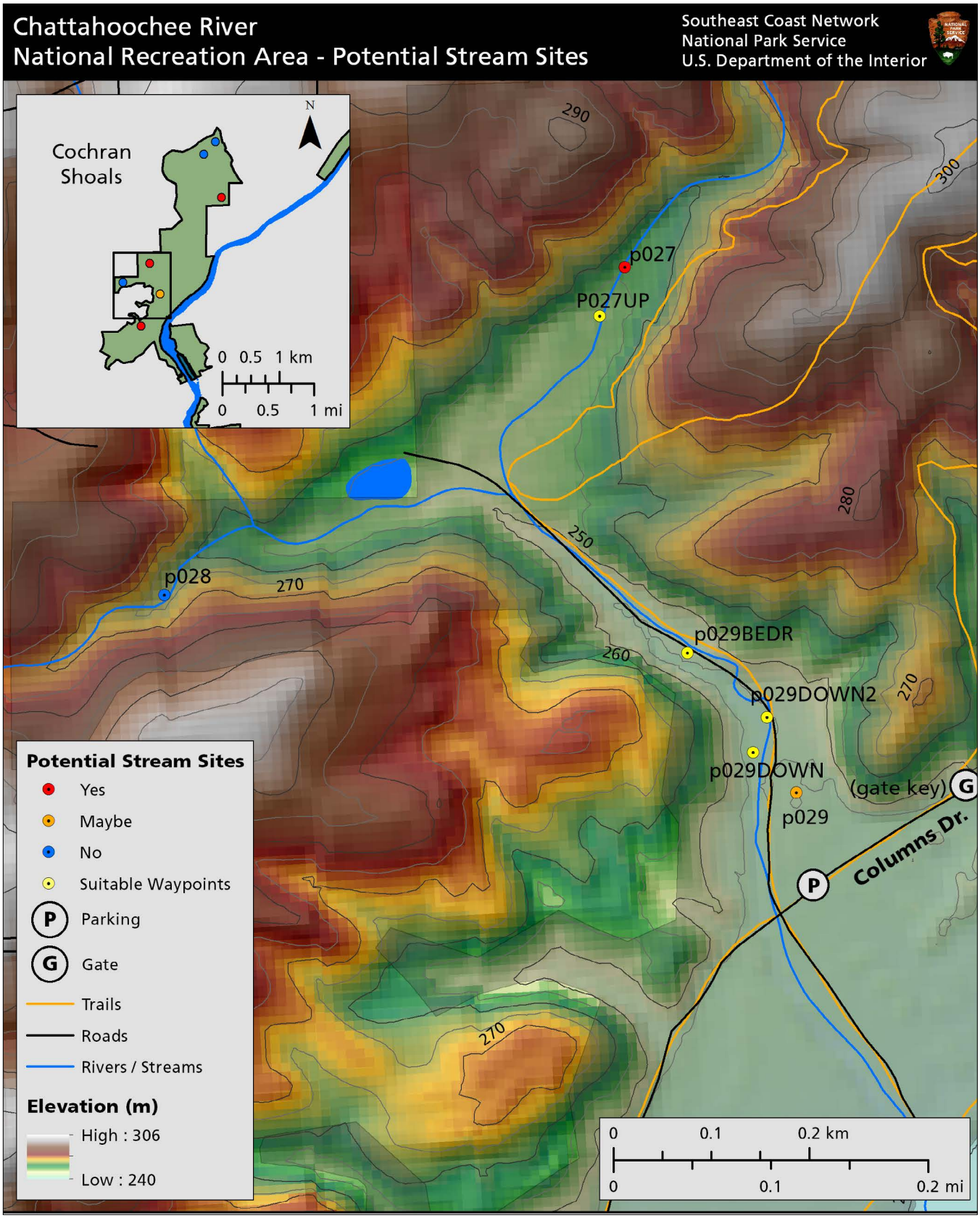


Figure A-24. Map of "Beaver Creek" (p027), "Diversion Creek" (p028), and Terrell Mill Creek (p029) which flow through the Cochran Shoals management unit.



Proposed Site Number:	p030
Park Unit:	Cochran Shoals
Stream Name:	Gunby Creek (CHAT 011)
Date:	3.14.2017
Time:	9:48 a.m.
Assessed by:	JMM, ENS et al.
Accessible:	Yes
Gate Key Required:	Yes (NPS)
Wadeable:	Yes
Recommend for Monitoring:	Yes

Best Point of Access/Parking: Cross bridge leading to p029 and then park at bend in trail at beginning of wetland on right.

Directions from Parking to Site: Walk up the trail that skirts the wetland and make way to site.

Management Issues Noted: Trail on river left, sewage right-of-way.

Safety Concerns: Debris dams, dying/falling limbs.

Site Summary— Gunby Creek is a small to medium-sized cobbly gravel bedded stream. Wetted width was estimated to be approximately 2 meters (6.6 ft) and bankfull width around 4–5 meters (13.1–16.4 ft). Water depth was estimated to be around 5–15 centimeters (2–5.9 in). Bank heights were approximately 1 meter (3.3 ft). Initial assessment of the creek classified the entrenchment of the segment as low. There is a fairly wide floodplain on river left and the hillslope is influencing most of river right. The banks were heavily vegetated (75–80%) with mosses, grasses, and ferns being the dominant vegetation where present. Some of the floodplain areas were covered in privet though not as thick as p029. There are many pieces of large woody debris influencing the stream (many look like they were the result of bank slumping). The point bar side of meander bends are mostly sandy gravel cobble bars. Point p030cut is where a neck cutoff is going to occur. Just downstream from this potential cutoff, the trail is draining into the stream. This drainage line is head cutting into the trail and potentially exacerbating the undercutting of the bank opposite where it enters. Point p030up is the potential upper boundary of the proposed survey reach.

Monitoring Recommendation— This site is recommended for monitoring (Figure A-25) because of its proximity to well used trails and the possibility to document the changes that will occur once the neck of the meander is cutoff and the channel changes course.

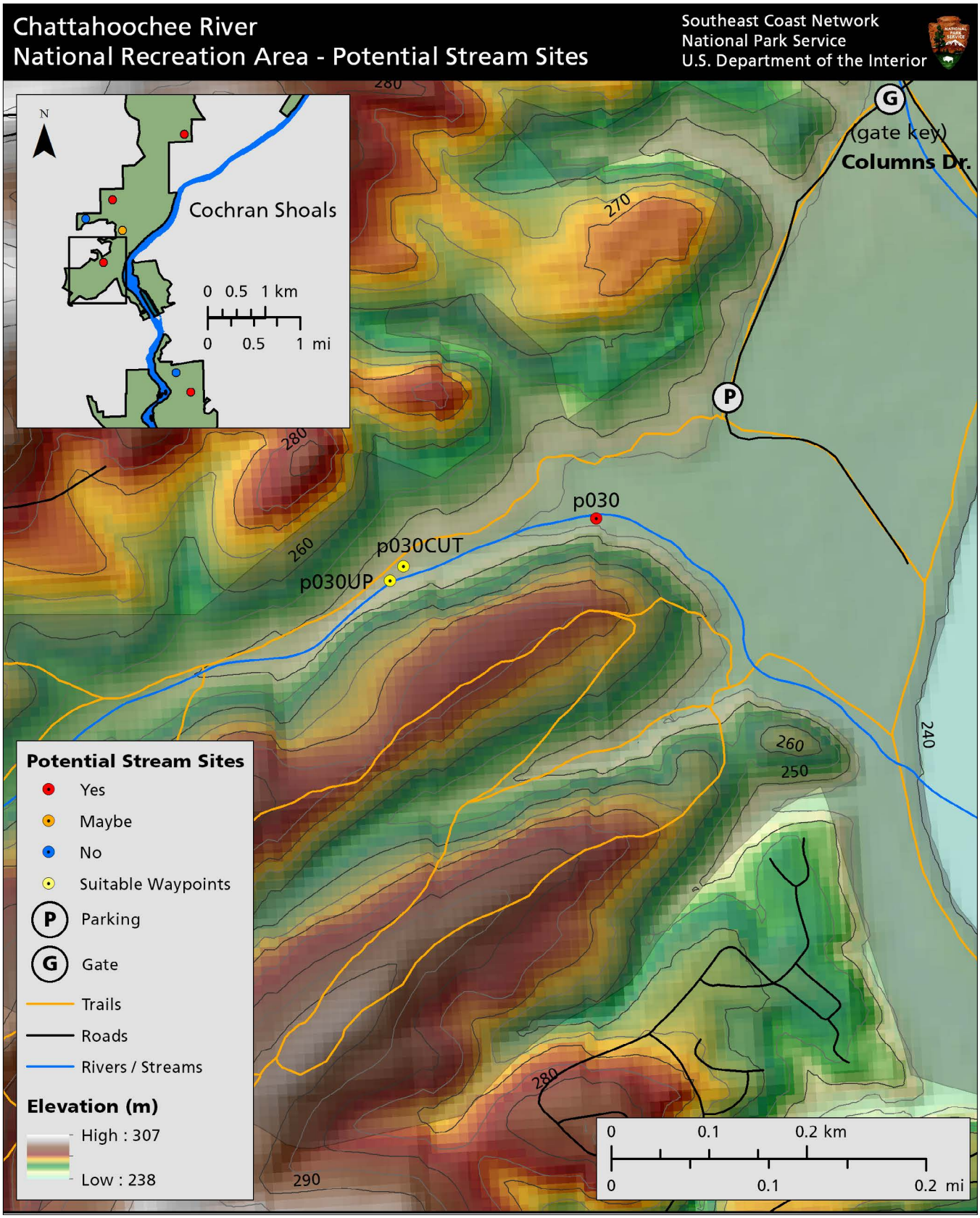


Figure A-25. Map of Gunby Creek (p030) which flows through the Cochran Shoals management unit.



Proposed Site Number: p031

Park Unit: Palisades

Stream Name: **"**Tree Rub Creek"

Date: 3.14.2017

Time: 5:12 p.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Indian Trail or closer trail head.

Directions from Parking to Site: Walk trail to bottom near Chattahoochee then walk upstream.

Management Issues Noted: Bridge downstream, Slope failures, Invasive plants(?)

Safety Concerns: Steep walk in, high banks on hillslope, slippery cobbles.

Site Summary— "Tree Rub Creek" (unnamed first order) is a small cobble and boulder bedded stream with some sand and fines in the lower energy areas. Wetted width was estimated to be approximately 1–2 meters (3.3–6.6 ft) and bankfull width around 2–3 (6.6–9.8 ft) meters. Water depth was estimated to be around 5–15 centimeters (2–5.9 in). Bank heights were approximately 0.3 meter (1 ft) were floodplains have been developed. Initial assessment of the creek classified the entrenchment of the segment as low though this stream is set within a relatively narrow valley. Some floodplain areas have developed but the stream is mostly influenced by the steep valley walls. The banks were sparsely vegetated (30–40%) with mosses, ferns, and shrubbery being the dominant vegetation where present. There are quite a few pieces of large woody debris influencing the stream and many look to have collapsed down from the hillside. Large portions of the hillslope are very high bare banks that could potentially slump down into valley. Upstream from p031, the stream is underlain by bedrock.

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-26) because the stream is mostly controlled by its proximity to the high valley walls and due to the safety hazard presented by trekking into this site and the potential for the valley walls to fail.

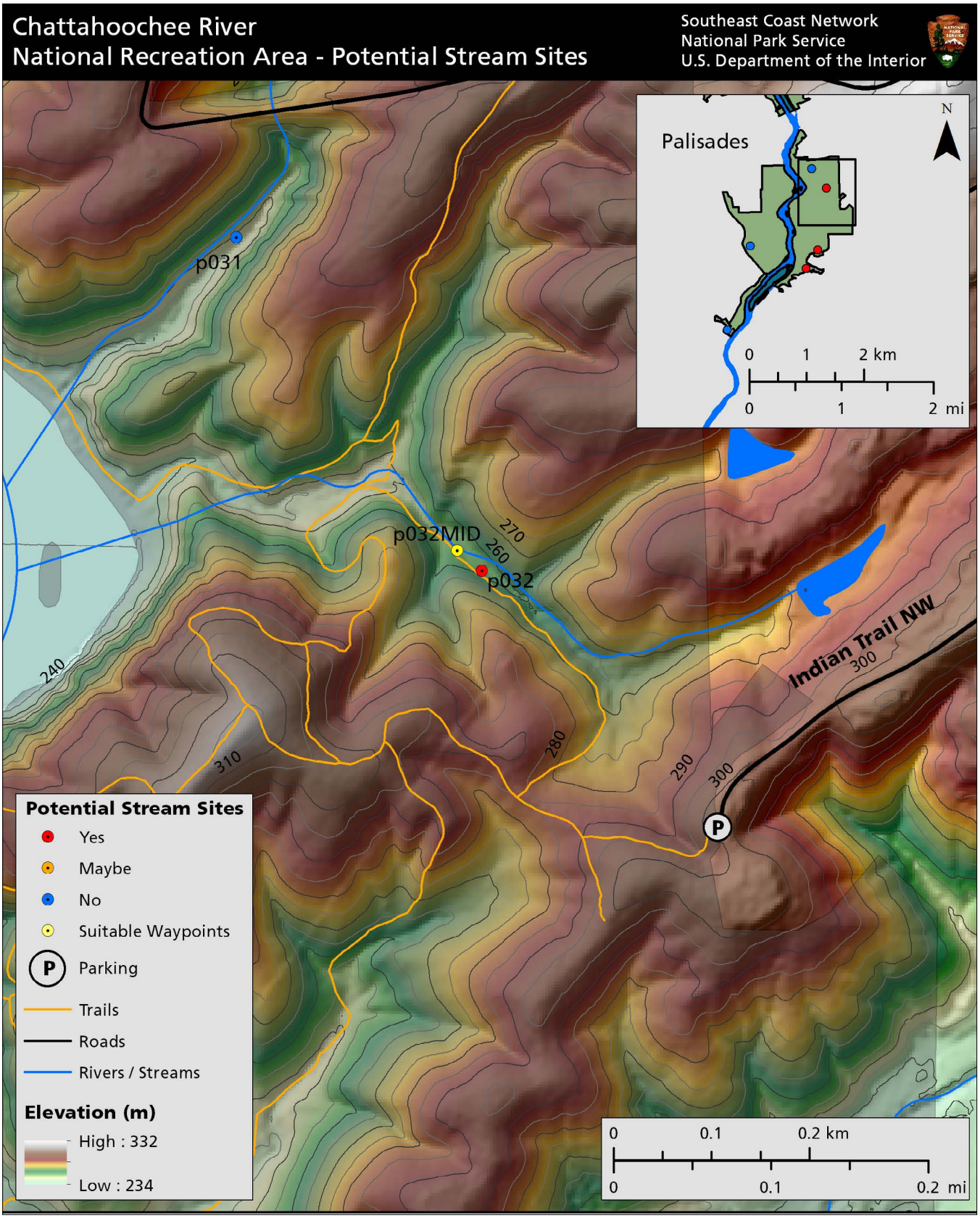


Figure A-26. Map of "Tree Rub Creek" (p031) and Cabin Creek (p032) which flow through the Palisades management unit.



Proposed Site Number: p032

Park Unit: Palisades

Stream Name: Cabin Creek (CHAT 012)

Date: 3.14.2017

Time: 4:38 p.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Park on Indian Trail at trail marker.

Directions from Parking to Site: Walk along trail to stream.

Management Issues Noted: Cutting into trail on river left.

Safety Concerns: Potential tree falls, trail leading in gets narrow and steep in one section.

Site Summary— Cabin Creek is a small gravely cobble bedded stream with a lot of fine material on the bed (interpreted as evidence of upstream urbanization). Wetted width was estimated to be approximately 1 meter (3.3 ft) and bankfull width around 1.5 meters (4.9 ft). Water depth was estimated to be around 10–15 centimeters (3.9–5.9 in). Bank heights were approximately 0.25 meter (0.8 ft). Initial assessment of the creek classified the entrenchment of the segment as low. The banks were sparsely vegetated (approximately 30%) with mosses and grasses being the dominant vegetation where present. There were only a few pieces of large woody debris influencing the stream. Caddisfly cases were observed under some rocks and a mayfly was also found in the stream. A trail runs right along river left and the stream is cutting into the trail. A seep was observed to be entering the stream downstream of p032mid and bedrock/hillslope is influencing the stream down below the proposed reach.

Monitoring Recommendation— This site is recommended for monitoring (Figure A-27) because of the interest expressed by the park and because it is influencing the trail that runs alongside.

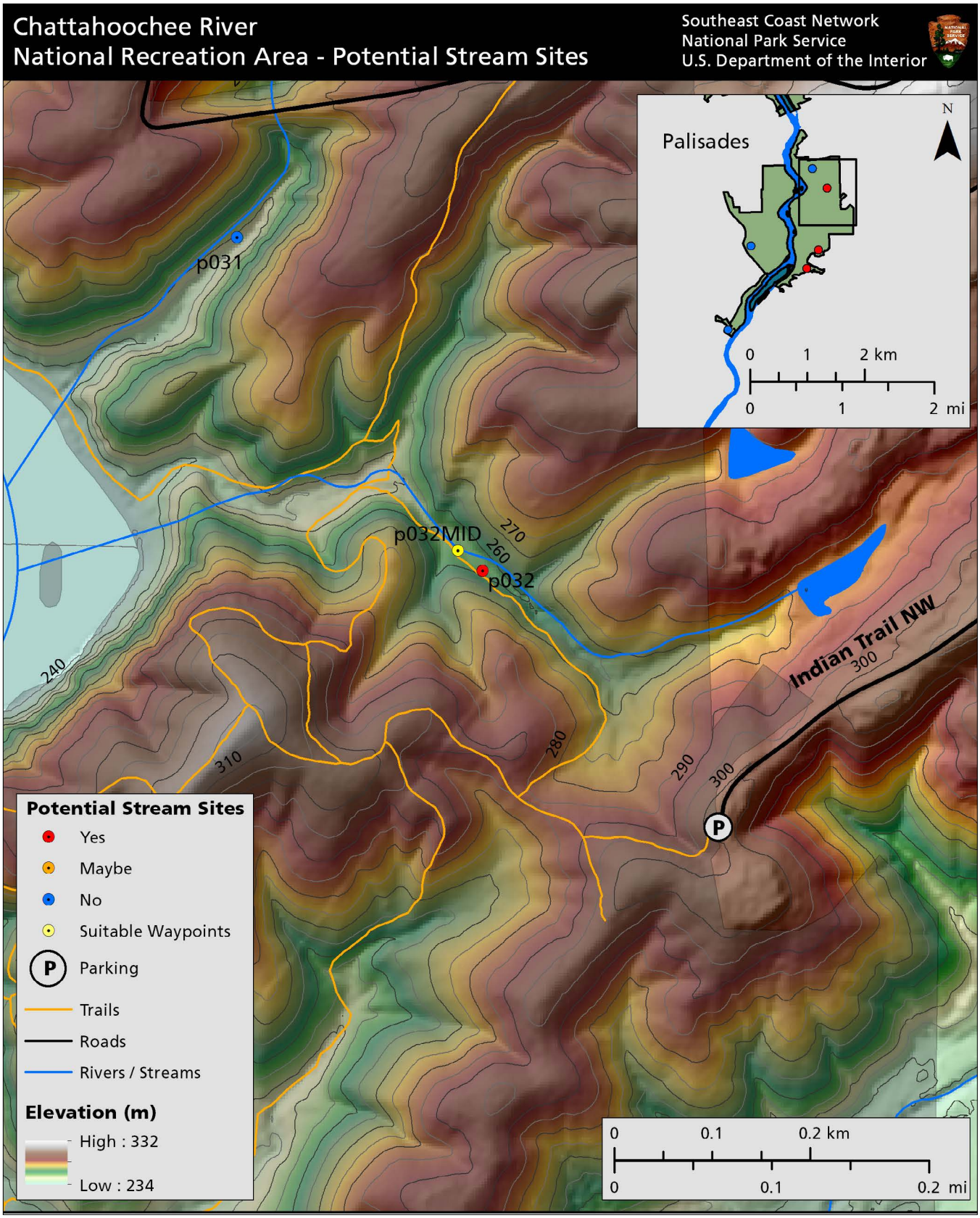


Figure A-27. Map of "Tree Rub Creek" (p031) and Cabin Creek (p032) which flow through the Palisades management unit.



Proposed Site Number: p033

Park Unit: Palisades

Stream Name: Long Island Creek (CHAT 013)

Date: 3.14.2017

Time: 3:38 p.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Whitewater Creek parking lot.

Directions from Parking to Site: Stream is north of the parking lot, can walk along trail to site.

Management Issues Noted: Trail runs alongside river right, downstream bridge.

Safety Concerns: Deep pools, leaning trees, steep banks.

Site Summary— Long Island Creek is a medium-sized gravel bedded stream. Wetted width was estimated to be approximately 1.5–2.5 meters (4.9–8.2 ft) and bankfull width around 8 meters (26.2 ft). Water depth was estimated to be around 10–100 centimeters (3.9–39.3 in). Bank heights were approximately 1 meter (3.3 ft) where floodplain has developed and around 2 meters (6.6 ft) high where the stream is cutting into the historical terrace. Initial assessment of the creek classified the entrenchment of the segment as moderate. The banks were sparsely vegetated (approximately 25%) with mosses and grasses being the dominant vegetation where present. Large woody debris was noted to be protecting banks and creating habitat. Point p033up was the first choice for monitoring but a gully under the bridge near this point was determined to be influencing the stream so a new point p033alt was suggested as the potential survey location. The gravel point bars are often paired with steep bare cutbanks. Upstream near p033alt the banks are higher and may require two workers to safely survey the detailed cross-sections.

Monitoring Recommendation— This site is recommended for monitoring (Figure A-28) because it is one of the most accessible larger streams that was assessed and due to its close proximity to well-used trails.

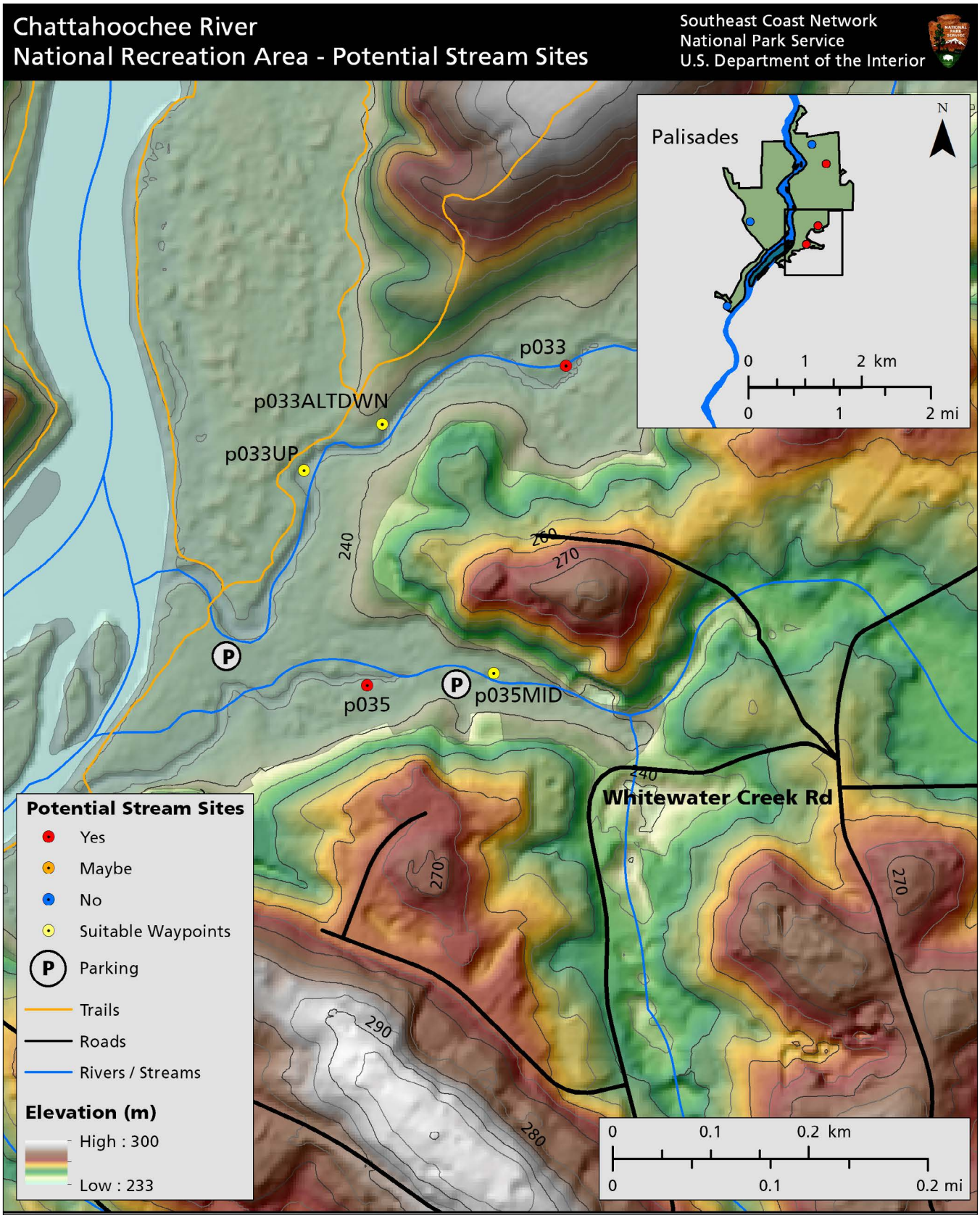


Figure A-28. Map of Long Island Creek (p033) and Whitewater Creek (p035) which flow through the Palisades management unit.



Proposed Site Number: p034

Park Unit: Palisades

Stream Name: Rottenwood Creek

Date: 3.14.2017

Time: 1:39 p.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes/No

Recommend for Monitoring: No

Best Point of Access/Parking: Park at Paces Mill lot.

Directions from Parking to Site: Walk along paved trail.

Management Issues Noted: Paved trails and bridges, sewer, I-75, upstream development.

Safety Concerns: Nonwadeable in places, rusty t-posts, water quality.

Site Summary— Rottenwood Creek is a larger-sized boulder and bedrock bottomed stream. Wetted width was estimated to be approximately 8 meters (26.2 ft) and bankfull width around 12 meters (39.4 ft). Water depth was estimated to be around 50–150 centimeters (19.7–59.1 in). Bank heights were approximately 1–2 meters (3.3–6.6 ft) where floodplain has developed and steep valley walls are not encroaching on the stream. Initial assessment of the creek classified the entrenchment of the segment as moderate. The banks were mostly vegetated (approximately 70–90%) with mosses being the dominant vegetation where present. Large woody debris was present and a few of the pieces looked to have been slumped into the stream from the steep hillslope. The stream is mostly bedrock controlled and there are significant cliffs approximately 30–40 meters high on river left (I-75 on river right). Downstream from bridge it flattens out a bit but it is definitely not wadeable at this point.

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-29) because it bedrock controlled and large portions of the stream segment are nonwadeable.

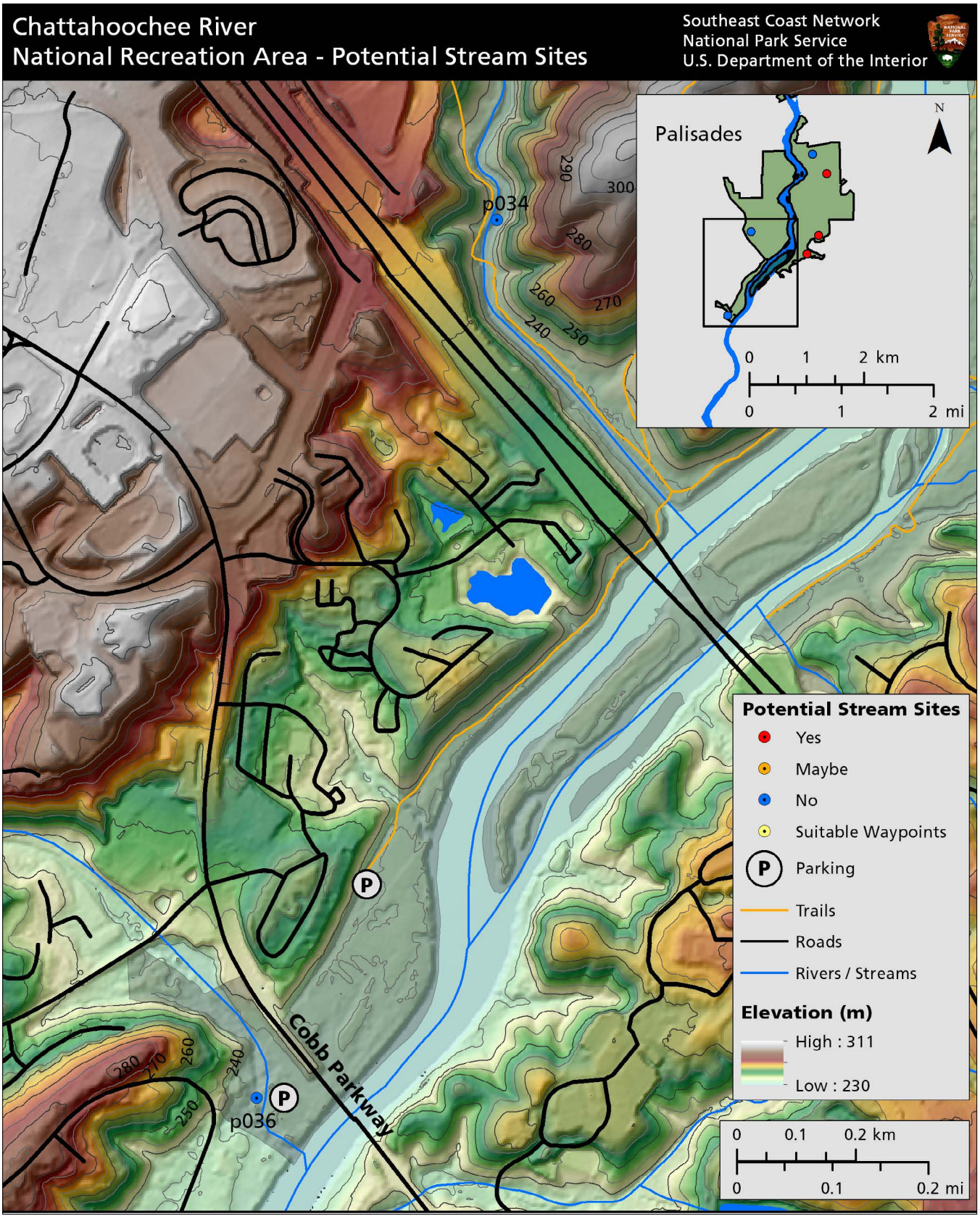


Figure A-29. Map of Rottenwood Creek (p034) and "Muck Creek" (p036) which flow through the western portion of the Palisades management unit.



Proposed Site Number: p035

Park Unit: Palisades

Stream Name: Whitewater Creek (CHAT 014)

Date: 3.14.2017

Time: 3:02 p.m.

Assessed by: JMM, ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Whitewater Creek parking lot (potentially on road near gas right of way).

Directions from Parking to Site: Walk up from the parking lot (upstream of gas right of way).

Management Issues Noted: Gas line right of way downstream, potential impacts from road.

Safety Concerns: Widow makers, broken glass on gravel bar.

Site Summary— Whitewater Creek is a small gravelly sand bedded stream. Wetted width was measured to be approximately 1.4 meters (4.6 ft) and bankfull width around 2.5 meters (8.2 ft). Water depth was estimated to be around 5–10 centimeters (2–3.9 in) and up to 30 centimeters (11.8 in) deep in pools. Bank heights were approximately 0.5–0.75 meter (1.6–2.5 ft). Initial assessment of the creek classified the entrenchment of the segment as low. The banks were sparsely to moderately vegetated (30–50%) with mosses, grasses, privet, and ferns being the dominant vegetation where present. Ferns were noted to be present right up to the water's edge. Large woody debris were prevalent and there was some very large large woody debris upstream of p035mid. There were also some large boulders observed upstream of p035mid. The point bars were sandy and there were a couple of flood chutes bisecting the meander bends. The banks were only mildly undercut. Some strange tubing/hose was observed in the bank on river right upstream of p035mid.

Monitoring Recommendation— This site is recommended for monitoring (Figure A-30) because it is one of the few streams with a well-developed floodplain on both sides of stream.

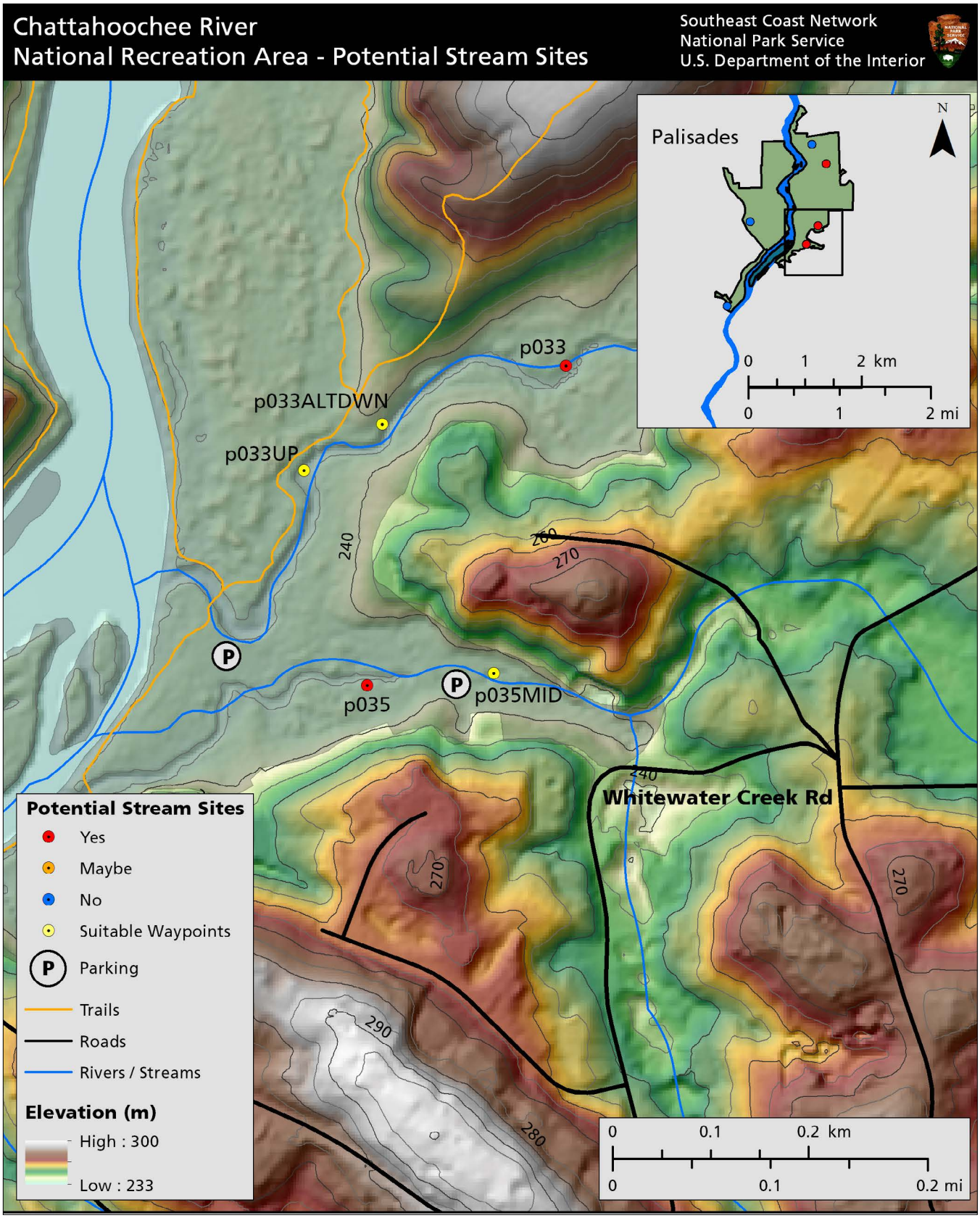


Figure A-30. Map of Long Island Creek (p033) and Whitewater Creek (p035) which flow through the Palisades management unit.



Proposed Site Number: p036

Park Unit: Palisades

Stream Name: **"**Muck Creek"

Date: 3.14.2017

Time: 2:29 p.m.

Assessed by: JMM, ENS

Accessible: No (vegetation and high banks)

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: No

Best Point of Access/Parking: Park in Paces Mill boat launch parking.

Directions from Parking to Site: Behind parking lot.

Management Issues Noted: Privet, high sheer banks.

Safety Concerns: High sheer banks, vegetation, large number of dog poop bags.

Site Summary— "Muck Creek" (unnamed first order) is a medium-sized mucky sand bedded stream. Wetted width was estimated to be approximately 4 meters (13.1 ft) and bankfull width around 7 meters (23 ft). Water depth was estimated to be around 50–100 centimeters (19.7–39.4 in). Bank heights were approximately 1 meter (3.3 ft) where floodplains have developed and around 2.5–3 meters (8.2–9.8 ft) high where the stream is cutting into the historical terrace. Initial assessment of the creek classified the entrenchment of the segment as high. The banks were moderately vegetated (40–60%) with grasses, privet, and shrubs being the dominant vegetation where present. Some large woody debris were observed in the stream but the thick vegetation on the historical terrace prevented much observation of the stream. The vegetation on the bank on river left was very thick and will likely be impenetrable during summer. The banks were also high and sheer and there was also widespread slumping at their base. A gully was also noted upstream of the fence entrance.

Monitoring Recommendation— This site is not recommended for monitoring (Figure A-31) because of the impenetrable vegetation and the safety hazard associated with the high sheer banks.

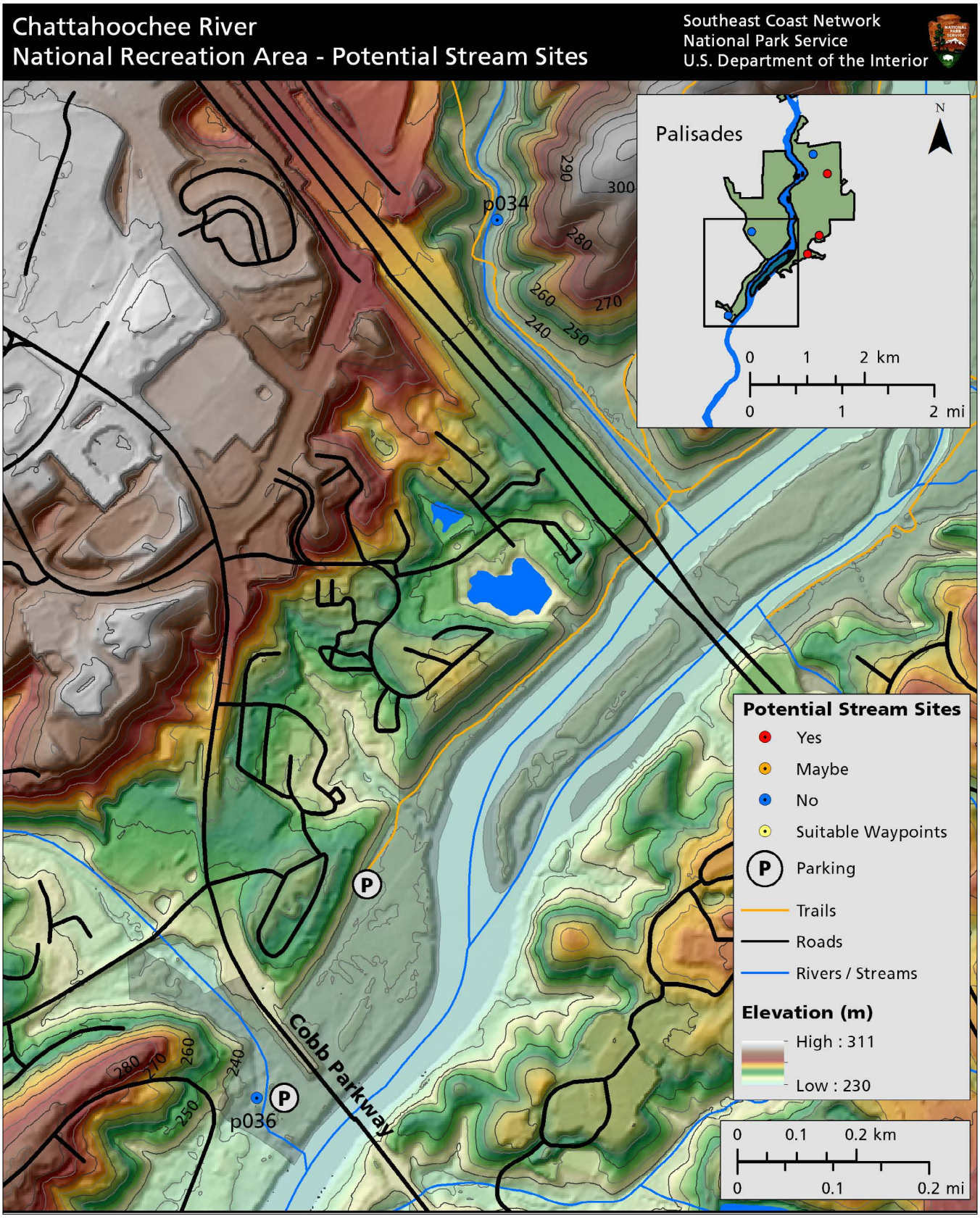


Figure A-31. Map of Rottenwood Creek (p034) and "Muck Creek" (p036) which flow through the western portion of the Palisades management unit.



Proposed Site Number: p037

Park Unit: Orrs Ferry

Stream Name: **"**Crayfish Creek" (CHAT 004)

Date: 3.15.2017

Time: 3:25 p.m.

Assessed by: JMM and ENS

Accessible: Yes

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Yes

Best Point of Access/Parking: Park next to the barn or on Park Service Road.

Directions from Parking to Site: Stream is flowing under driveway.

Management Issues Noted: Upstream culvert, close proximity to Hwy 20.

Safety Concerns: Traffic, falling limbs (not great threat).

Site Summary— "Crayfish Creek" (unnamed first order) is a small to medium-sized cobbly muck bedded stream. Wetted width was estimated to be approximately 2 meters (6.6 ft) and bankfull width around 5 meters (16.4 ft). Water depth was estimated to be around 5–20 centimeters (2–7.9 in). Bank heights were approximately 0.5 meter (1.6 ft) where floodplains have developed and around 1.25 meters (4.1 ft) high where the stream is cutting into the historical terrace. Initial assessment of the creek classified the entrenchment of the segment as low. The banks were sparsely to moderately vegetated (25–60%) with mosses, grasses, and ferns being the dominant vegetation where present. Not much large woody debris in the channel but there are a bunch of overhanging trees being undercut and a few look close to failure. While the point and in-channel bars are composed of cobbles and sand, the bed is choked with fine sediment. Some bedrock was observed in the channel bed but did not look like a dominant control on channel development. A UTV trail has been cut on river left. There was blue flagging on trees going down the stream that looked like they were related to a stream survey (equalish intervals).

Monitoring Recommendation— This site is recommended for monitoring (Figure A-32) because of the potential to observe the impacts highway restructuring and upstream development will have on the evolution of this stream channel.

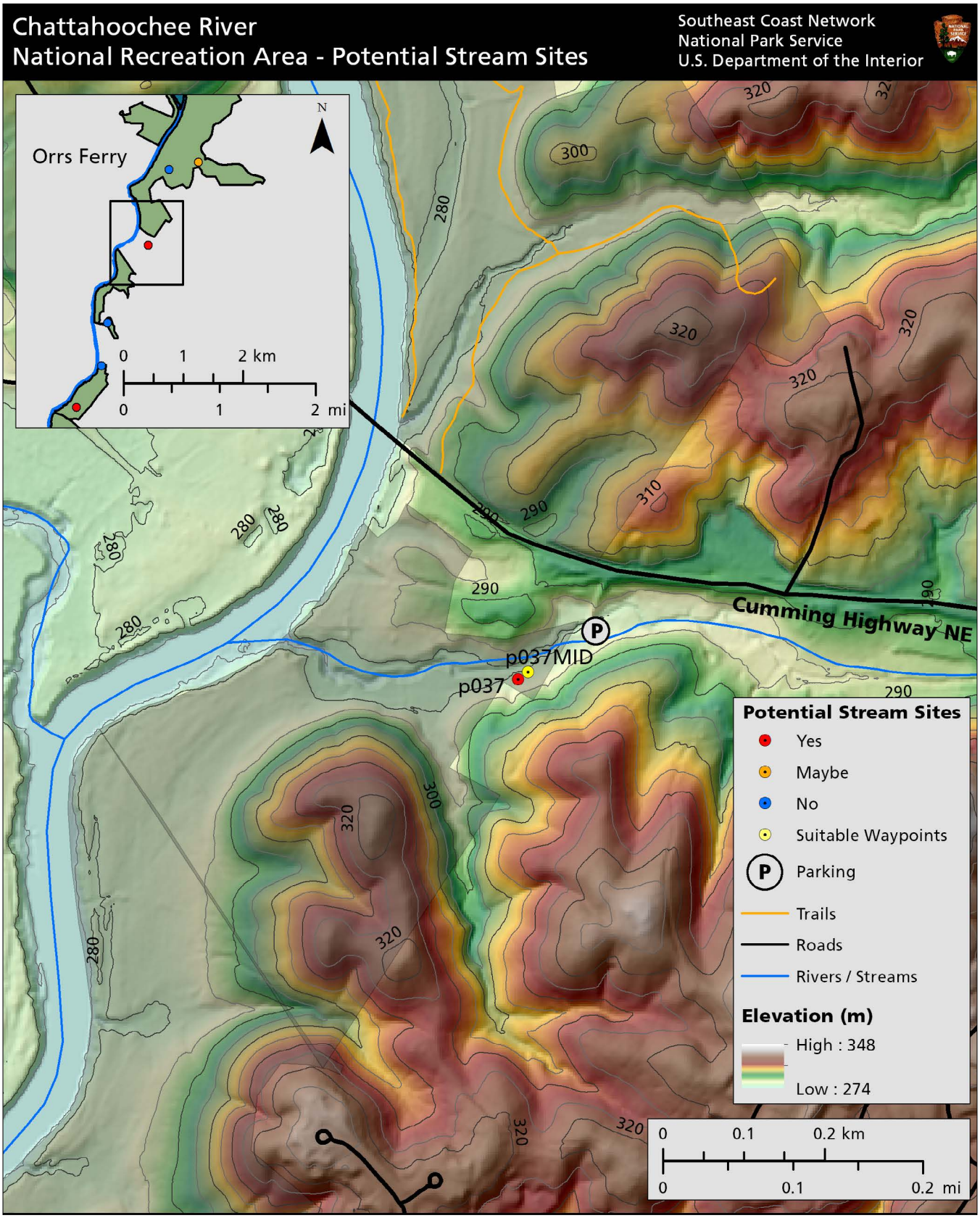


Figure A-32. Map of "Crayfish Creek" (p037) which flows through the northern portion of the Orrs Ferry management unit.



Proposed Site Number: p038

Park Unit: Settles Bridge

Stream Name: Level Creek

Date: 3.15.2017

Time: 1:36 p.m.

Assessed by: JMM, ENS, and PDM

Accessible: Yes/No (see below)

Gate Key Required: No

Wadeable: Yes

Recommend for Monitoring: Maybe/No

Best Point of Access/Parking: Park at end of Middle Fork Trl, best would be from golf course.

Directions from Parking to Site: Trek up/down/up/down 0.5 mi NW from parking…or hop out of a golf cart and ta-da.

Management Issues Noted: Golf course on river right, potential for upslope development.

Safety Concerns: High banks, some undercutting dangers.

Site Summary— Level Creek is a medium to large-sized sand bedded stream with gravel in the higher energy areas. Wetted width was estimated to be approximately 6.5 meters (21.3 ft) and bankfull width around 11 meters (36.1 ft). Water depth was estimated to be around 20–50 centimeters (7.9–19.7 in). Bank heights were approximately 1.5 meters (4.9 ft) where floodplains have developed and around 3.5 meters (11.5 ft) high where the stream is cutting into the historical terrace. Initial assessment of the creek classified the entrenchment of the segment as moderate to low because the stream as established some floodplain but is inset in a wide entrenched valley. The banks were bare to moderately vegetated (0–50%) with mosses and grasses being the dominant vegetation where present. Bank failure has caused some large woody debris to interact with the stream (as bank protection and habitat creation). The banks are high and exhibit slumping where floodplain has not developed. Asian clams were observed in the stream as well as some orange (iron) flocking.

Monitoring Recommendation— This site is potentially recommended (Figure A-33) for monitoring if an easier access point can be ensured. There are also concerns with picking this site because only one side of the stream is owned by the park.

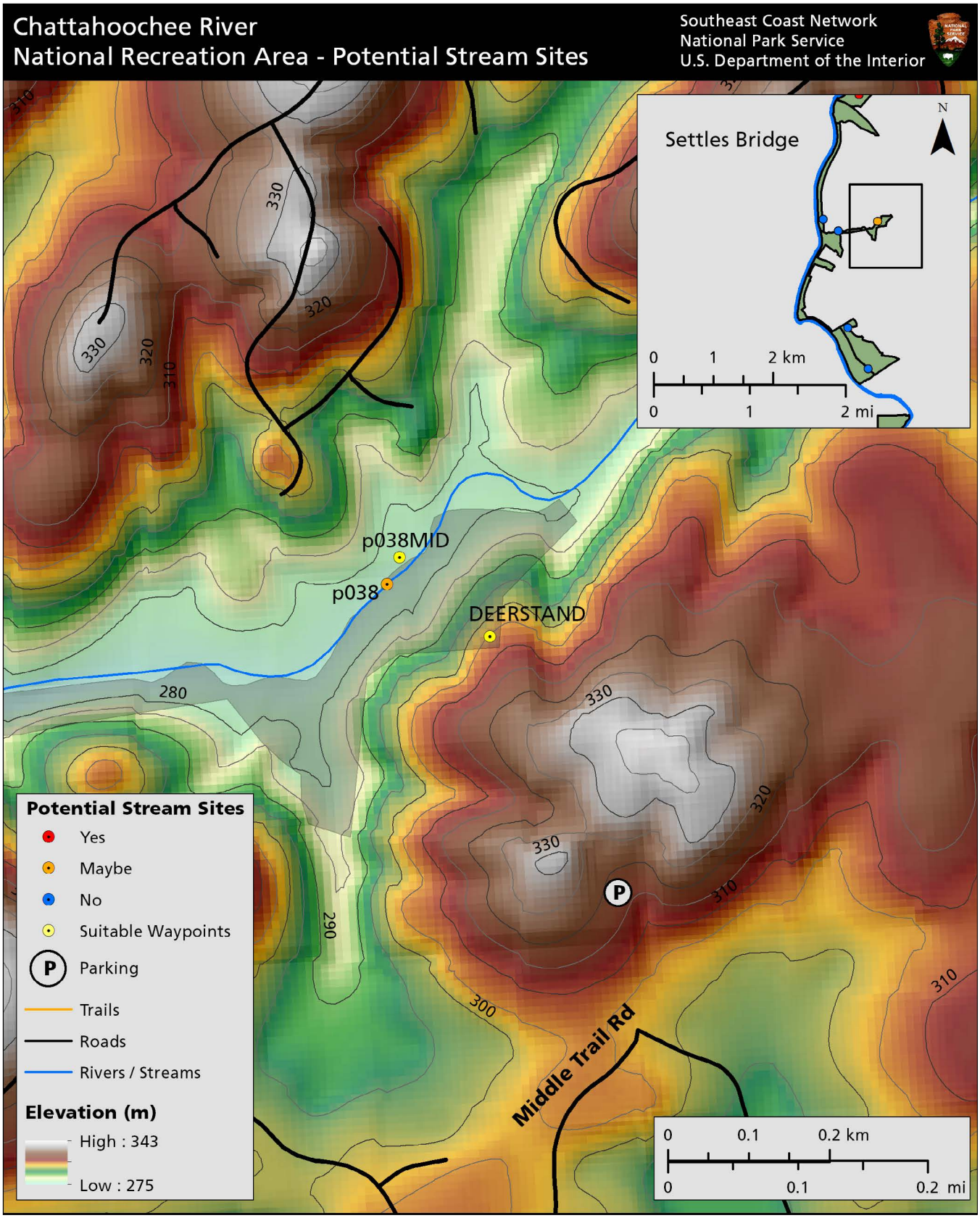


Figure A-33. Map of Level Creek (p038) which flows through the Settles Bridge management unit.

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NPS 636/149005, October 2018

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