June 6, 2014

Mr. Chris White, Deputy Director
Ulster County Planning Department
244 Fair Street
Kingston, NY 12402

Re: Catskill Mountain Railroad Condition Report

Dear Mr. White:

HDR conducted a track inspection on the behalf of Ulster County to determine compliance with Code of Federal Regulations (CFR) Title 49, Part 213, Subpart A to F, Class 1 and Non-Class Specific Standards on the Catskill Mountain Railroad between Downs Street in Kingston, NY and Bridge Street in Phoenicia, NY. In addition, this inspection was performed to determine if the Lessee Operator is in compliance with its lease requirements in regards to track and right of way maintenance.

Inspections were conducted on foot with two (2) HDR inspectors and one (1) representative from Ulster County between Monday, May 12, 2014 and Thursday, May 15, 2014. Both HDR inspectors have been trained and qualified on Roadway Worker Protection Procedures.

A level board was used to measure deviations in crosslevel and to check gage. If gage was found using a level board, a 1" x 25 ft. tape measure was used to verify the deviation. Joint tie defects were determined by using the tape measure to determine a 24" envelope from the center of the joint. Deviations were visually determined and verified by using the appropriate measurement tools.

Deviations from Class I track were determined by comparing them to standard, newly constructed track. Standard track consists of creosote-treated hardwood crossties, spaced 19 ½" on center. Steel rails measuring 33 ft. are fastened to the hardwood crossties using 5/8" x 6" cut spikes. Individual rails are then bolted together using 6 hole joint bars. Tie plates of varying dimensions are used to restrain the rail vertically and laterally. Rail anchors are used to restrain the rail longitudinally and are typically box-anchored for four (4) ties per rail length. The track structure is restrained by granite ballast material that also aids in drainage.

Conditions that did not meet Class 1 Standards, Non-Class Specific Standards, or Terms of the Lease were photographed with approximate GPS coordinates. This data was then evaluated and used to make a map (found in Appendix 'A' of this report) that shows the approximate location and density of noted defects. Class 1 Defects must be repaired to operate passenger service; Non-Class Specific Defects must be repaired within 30 days of identification to remain in compliance with CFR Title 49, Part 213 regulations.

Appendix 'B' contains photographs of typical conditions that were found. These photographs are representative of the majority of the Corridor.

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695 Atlantic Ave, Boston MA 02111
T 617.357.7700 F 617.357.7759

The following table is a summary of the general conditions found during the walking inspection:

From	To	Approximate Distance	Condition Assessment
Downs Street	RT. 209	2.2 miles	Maintained to Class 1 standards, defects within these limits have been identified.
RT. 209	Hurley Mountain Road	0.5 miles	Does not meet Class 1 standards, an attempt is being made to restore the track.
Hurley Mountain Road	Esopus Creek Trestle	15.3 miles	Does not meet Class 1 standards, poor tie conditions observed, drainage work required, vegetation not maintained.
Esopus Creek Trestle		400 ft	Bridge is washed out.
Esopus Creek Trestle	Cold Brook Station	0.9 miles	Does not meet Class 1 standards, poor tie conditions observed, drainage work required, vegetation not maintained.
Cold Brook Station	MP 23.3	1.1 miles	Was maintained to Class 1 standards, however due to washouts, track is inoperable, and vegetation is beginning to regrow.
MP 23.3	MP 25.8	2.5 miles	Maintained to Class 1 standards, defects within these limits have been identified.
MP 25.8	Bridge Street	1.9 miles	Does not meet Class 1 standards, poor tie conditions noted, washouts, drainage work required, vegetation not maintained.

As of May 31, 2014, the Lessee has completed its 23 lease year with the county. According to the Rehabilitation and Maintenance section of the lease dated May 29, 1991, the Lessee is required to rehabilitate a minimum of 1 mile of track per lease year. Additionally, the Lessee shall perform all maintenance necessary to keep the rehabilitated track at that Class 1 Standard. Of the 24.5 miles inspected, 4.7 miles appeared to be maintained to meet Class 1 conditions. Also, it appeared the Lessee was attempting to restore another 0.5 miles between Rt. 209 and Hurley Mountain Road.

The majority of the corridor experiences minimal, if any, maintenance based on our visual inspection. In the two areas where train operations are conducted, the condition of the corridor exhibited past maintenance keeping it mostly within Class I Standards. However, some defects were identified and were submitted to Ulster County in a preliminary report (Appendix 'C').

In areas where train operations are not conducted, it was not evident that the required level of maintenance to support Class 1 railroad operations was performed over the 20-year period. Mature trees were found growing in the ditches, rotted, split, and missing ties were observed consistently, and numerous joint conditions were found. Some limited brush cutting was conducted in areas along the reservoir, but not to a degree that would comply with CFR Title 49, Part 213, Section 37.

In order to bring all areas that do not meet Title 49, Part 213 Class I standards into compliance, a comprehensive maintenance plan must be implemented. Drainage and vegetation defects will need to be repaired along the entire corridor. A tie replacement program will need to be

implemented along the corridor which will require an average of 700 new ties per mile. The maintenance plan will also require track bolt maintenance and joint bar replacement.

Ongoing neglect of drainage and vegetation maintenance may lead to further washouts along the corridor. It was observed that many of the washouts that occurred were caused by drainage structures becoming fouled with branches, leaves, and other debris.

Thank you for the opportunity to make the condition assessment along the Catskill Mountain Rail Corridor. If I could be of any further assistance, please contact me at (617) 357-7700.

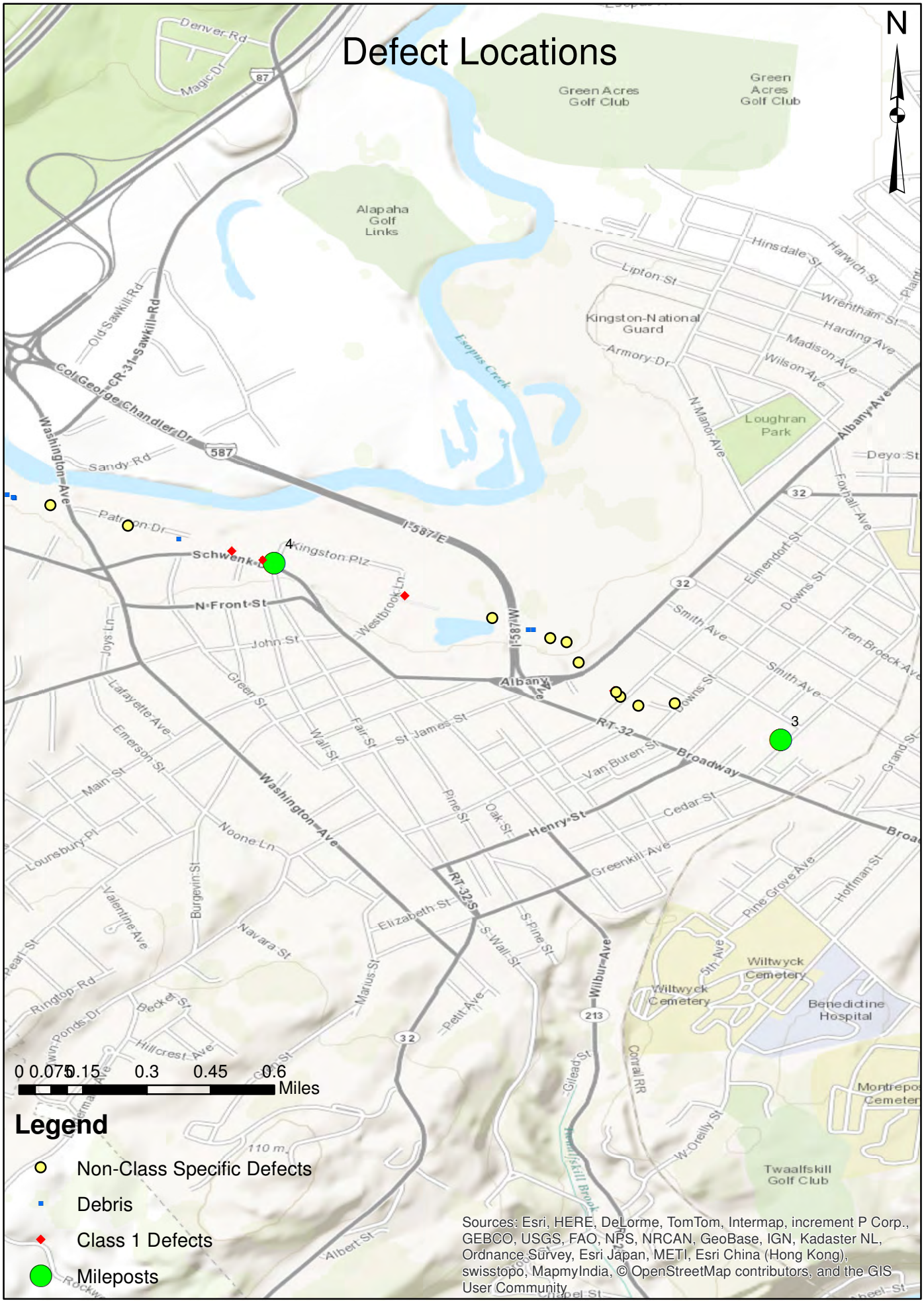
Sincerely,

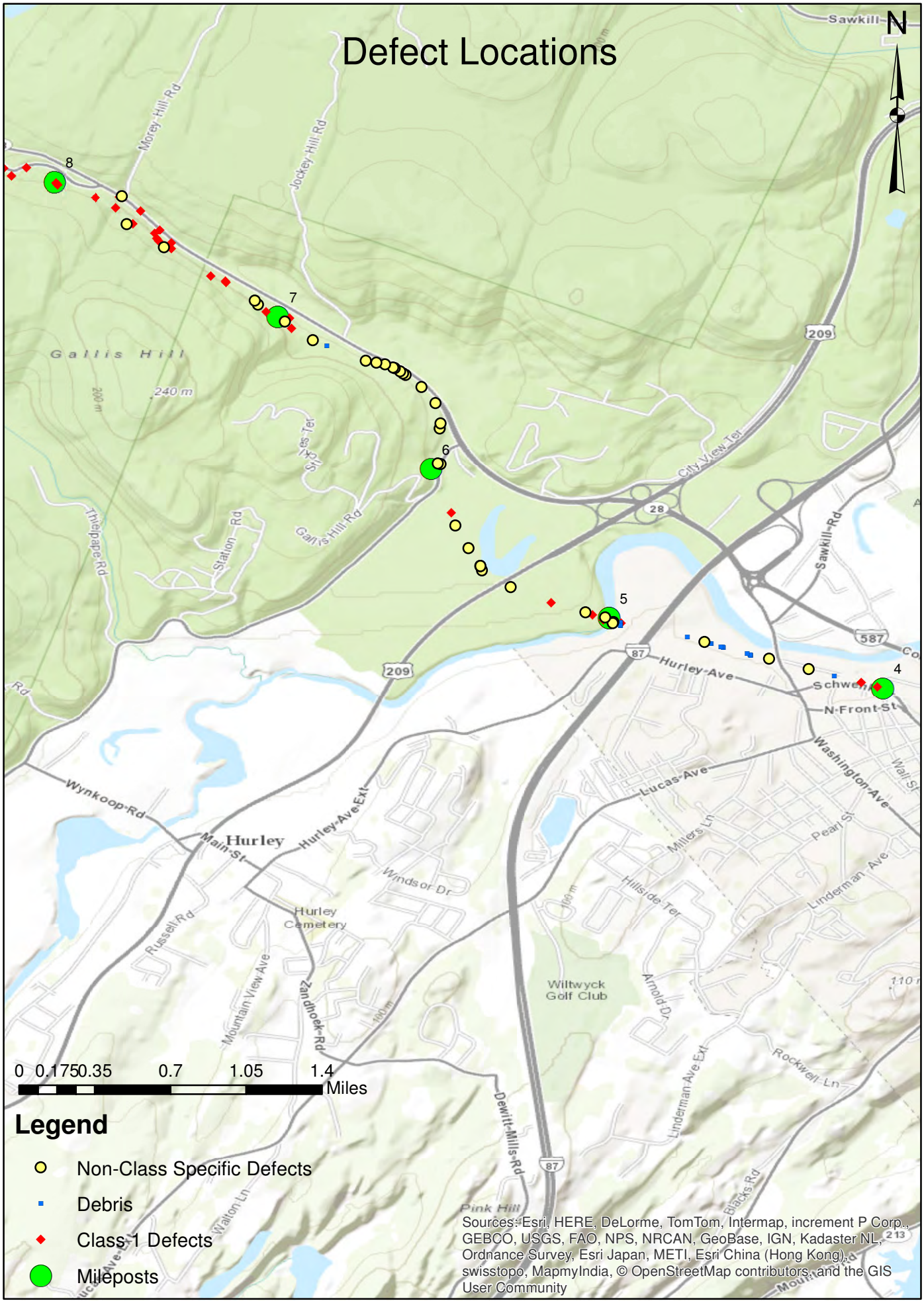
Owen Smith
Rail Engineer

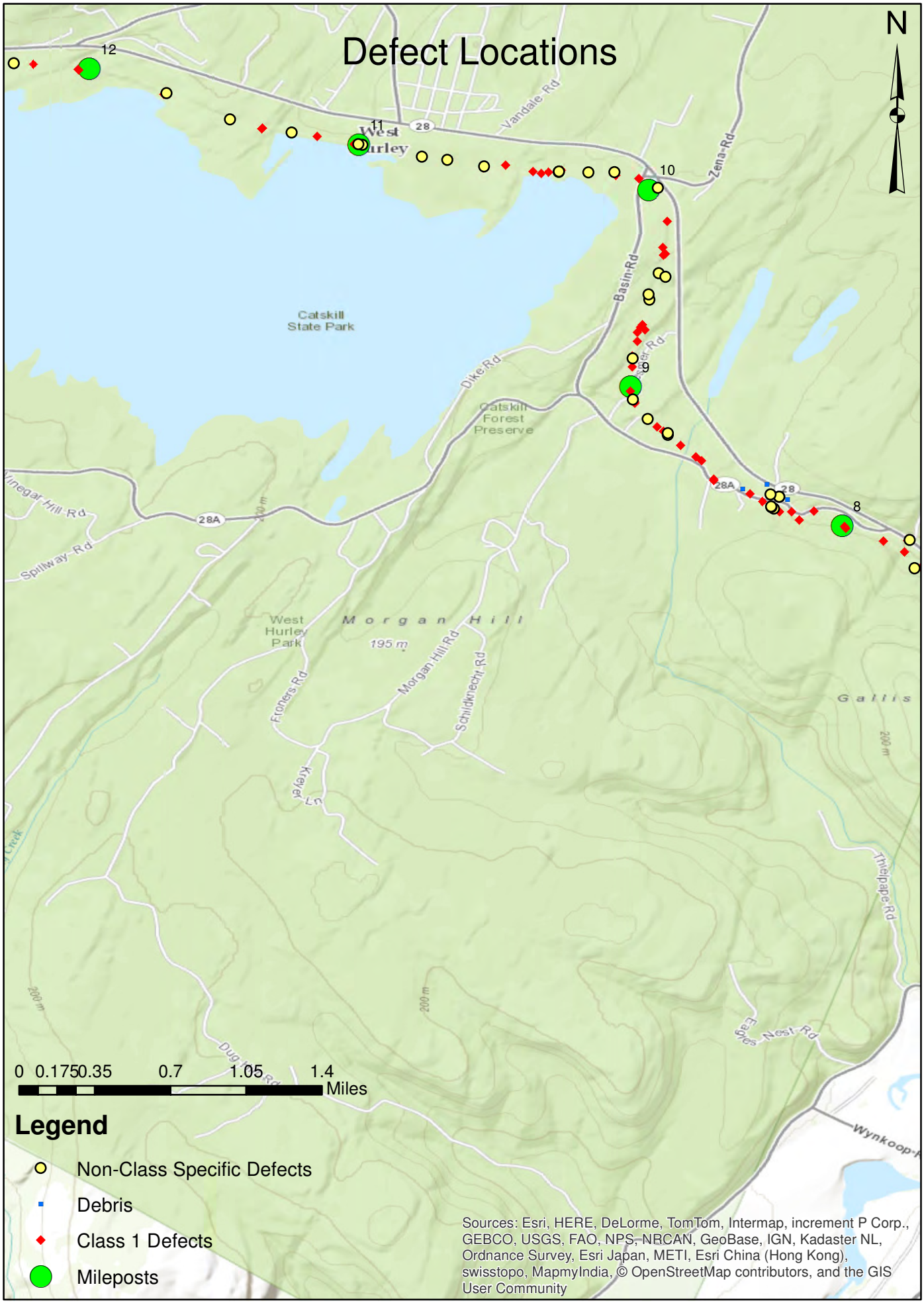
Attachments (3)

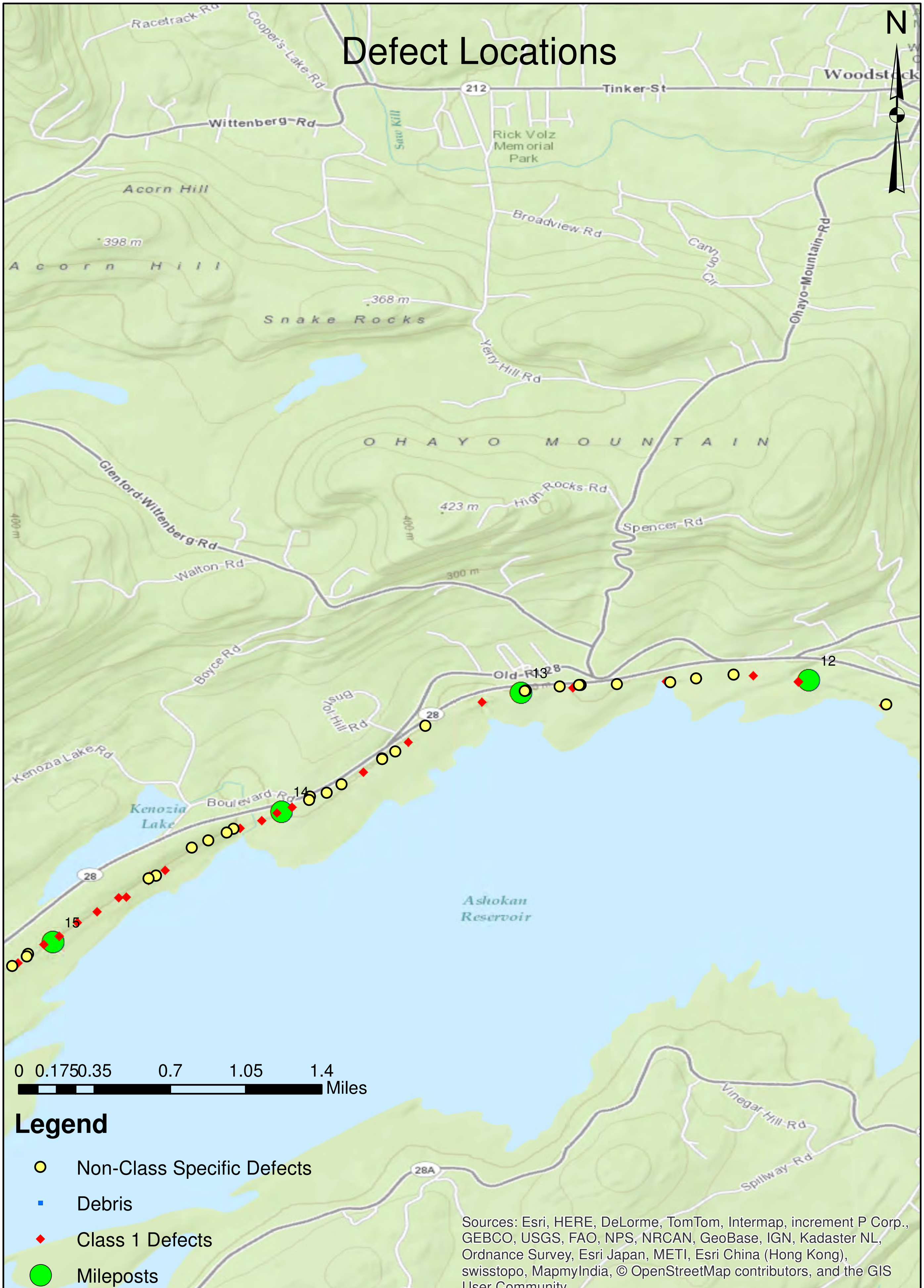
cc: Richard Semenick, HDR
Ken Briggs, HDR

Appendix A
Defect Locations

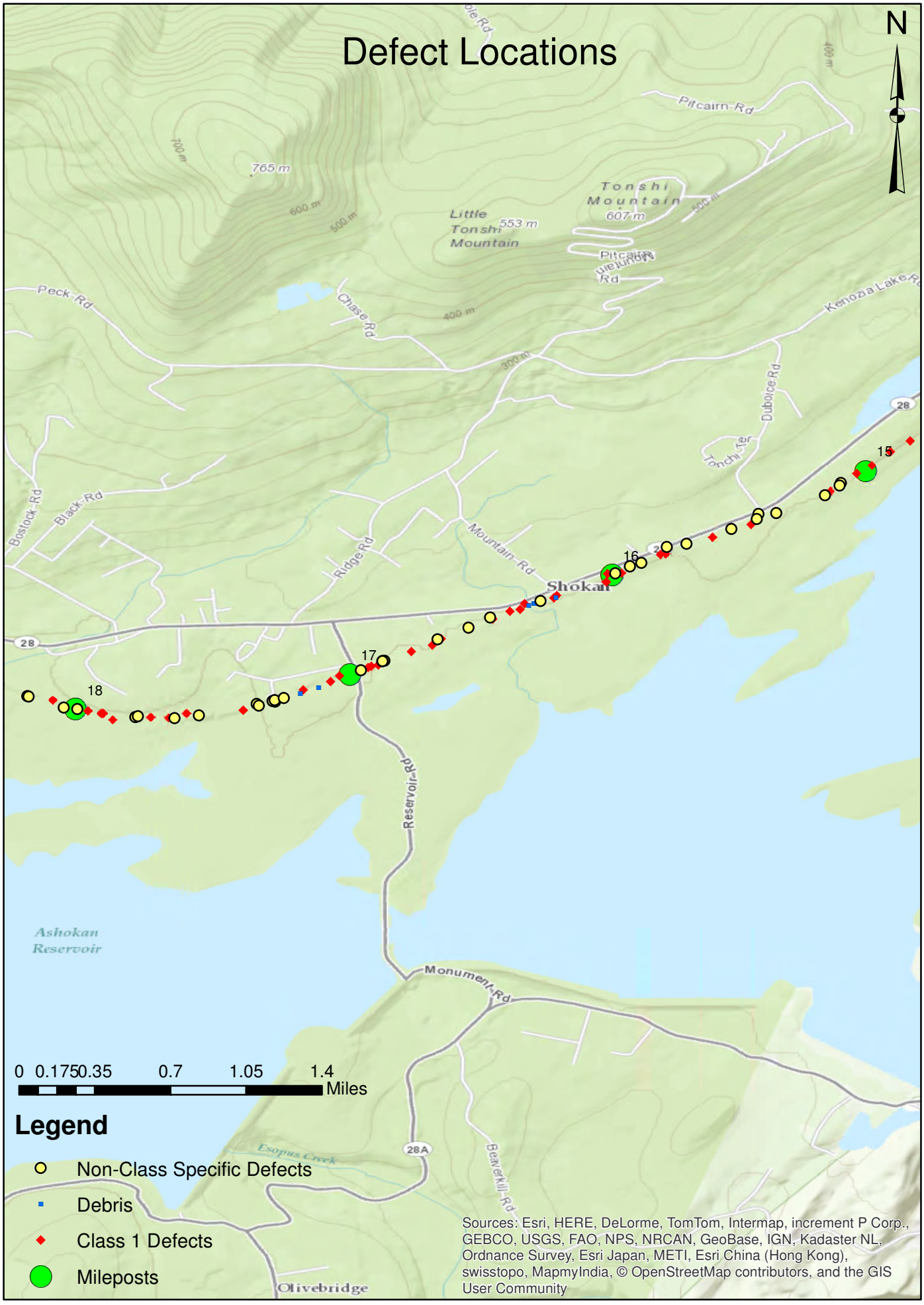

Defect Locations
N
Green Acres Golf Club
Green Acres Golf Club
Alapaha Golf Links
Kingston-National Guard
Loughran Park
Wiltwyck Cemetery
Wiltwyck Cemetery
Benedictine Hospital
Twaalfskill Golf Club
Esopus Creek
Twaalfskill Brook
Denver Rd
Magic Dr
87
Old Sawkill Rd
CR-31 Sawkill Rd
Col George Chandler Dr
587
Washington Ave
Sandy Rd
Patroon Dr
Schwenk Dr
Kingston Plz
4
I-587 E
I-587 W
N Front St
Westbrook Ln
John St
Joys Ln
Lafayette Ave
Green St
Emerson St
Main St
Wall St
Fair St
St James St
Albany Ave
RT-32
Broadway
3
Van Buren St
Pine St
Oak St
Henry St
Cedar St
Greenkill Ave
Noone Ln
Lounsbury Pl
Burgevin St
Valentine Ave
Navara St
Pearl St
Ringtop Rd
Beckett St
Hillcrest Ave
Elizabeth St
RT-32S
S Wall St
S Pine St
Wilbur Ave
213
Petitt Ave
Marius St
Gilead St
Conrail RR
W O'reilly St
Albert St
Chapel St
110 m
Lipton St
Hinsdale St
Harwich St
Wrentham St
Harding Ave
Madison Ave
Wilson Ave
Armory Dr
N Manor Ave
Albany Ave
Deyo St
Foxhall Ave
Elmendorf St
Downs St
Smith Ave
Ten Broeck Ave
Grand St
Pine Grove Ave
Hoffman St
5th Ave
0 0.075 0.15 0.3 0.45 0.6
Miles
Legend
Non-Class Specific Defects
Debris
Class 1 Defects
Mileposts
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

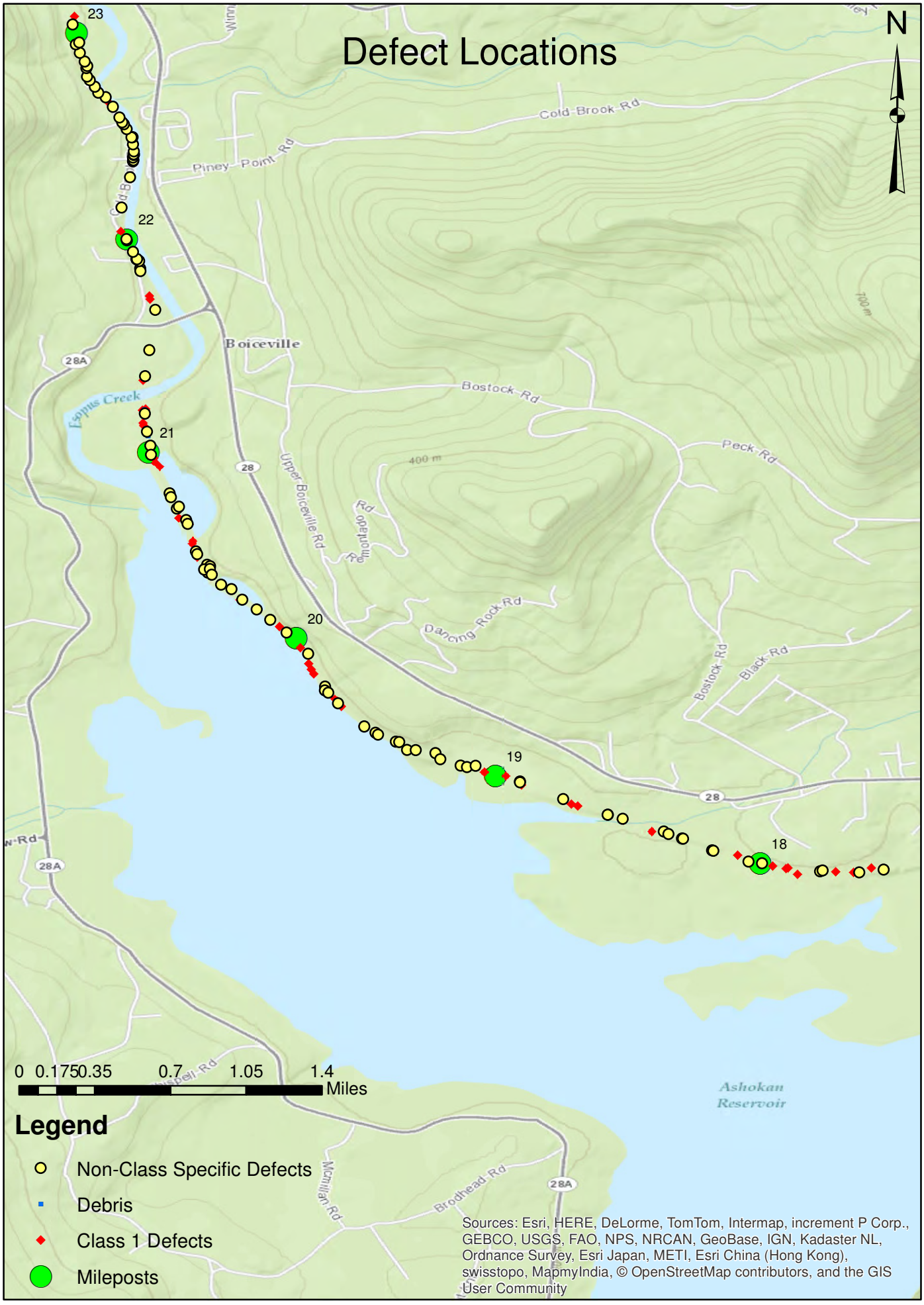

Defect Locations
N
8
7
6
5
4
Morey Hill Rd
Jockey Hill Rd
Gallis Hill
240 m
200 m
Gallis Hill Rd
Station Rd
Thielpape Rd
City View Ter
Sawkill Rd
Sawkill
209
28
87
587
Hurley Ave
N Front St
Schwenk
Wynkoop Rd
Hurley
Main St
Hurley Ave Ext
Lucas Ave
Washington Ave
Pearl St
Millers Ln
Hillside Ter
Linderman Ave
Windsor Dr
Hurley Cemetery
Russell Rd
Mountain View Ave
Zandhoek Rd
Wiltwyck Golf Club
Arnold Dr
Linderman Ave Ext
Rockwell Ln
Dewitt Mills Rd
Pink Hill
Blacks Rd
Walton Ln
0 0.175 0.35 0.7 1.05 1.4
Miles
Legend
Non-Class Specific Defects
Debris
Class 1 Defects
Mileposts
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

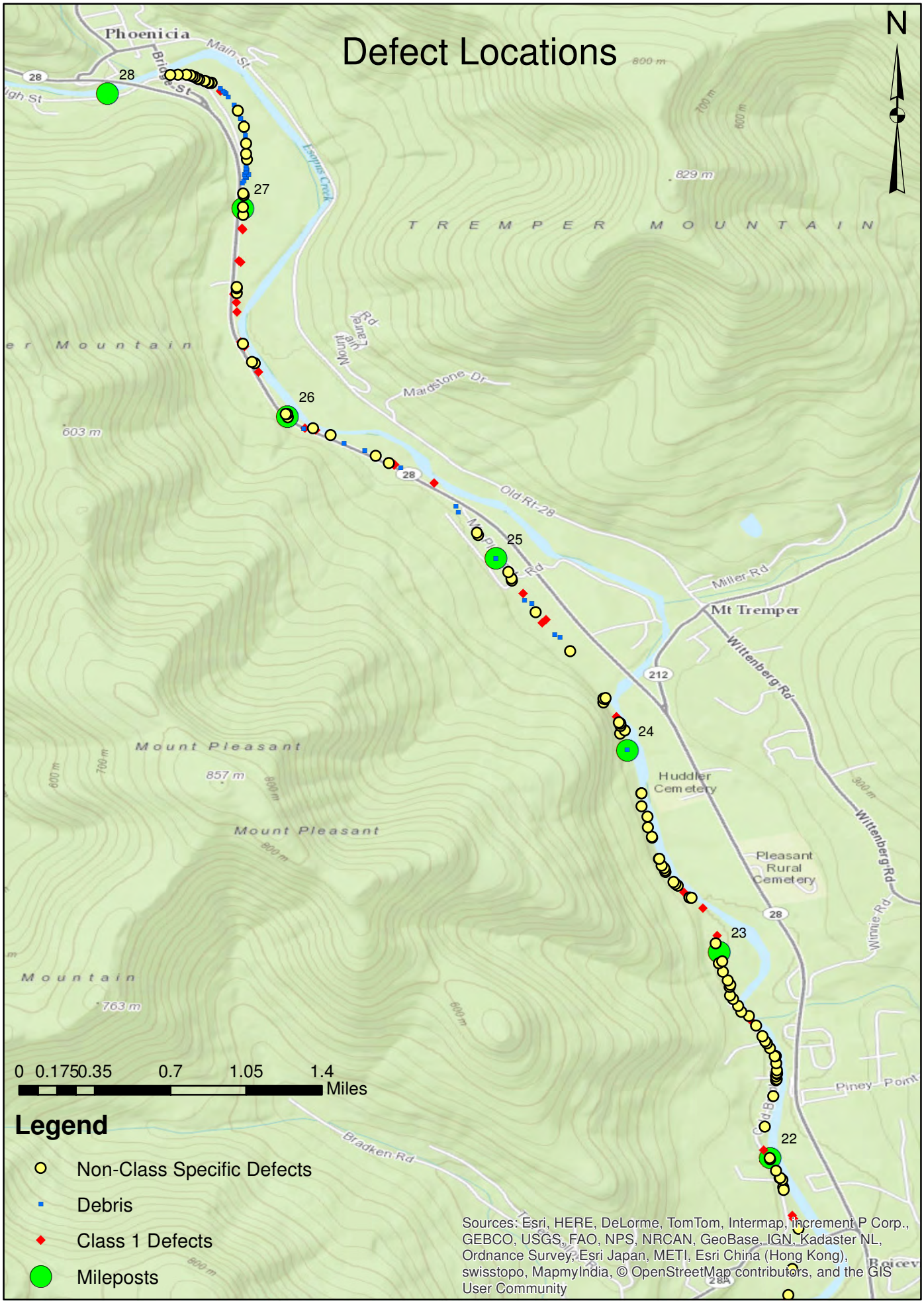

Defect Locations
N
12
11
10
9
8
West Hurley
28
Vandale Rd
Zena Rd
Basin Rd
Catskill State Park
Dike Rd
Catskill Forest Preserve
28A
Vinegar Hill Rd
Spillway Rd
West Hurley Park
Morgan Hill
195 m
Morgan Hill Rd
Schildkriecht Rd
Froners Rd
Kreiger Ln
Gallis
Thielpape Rd
Eagles Nest Rd
Wynkoop
0 0.175 0.35 0.7 1.05 1.4
Miles
Legend
Non-Class Specific Defects
Debris
Class 1 Defects
Mileposts
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



Defect Locations
N
Racetrack Rd
Cooper's Lake Rd
212
Tinker St
Woodstock
Wittenberg Rd
Saw Kill
Rick Volz Memorial Park
Acorn Hill
398 m
A c o r n H i l l
Broadview Rd
Cann Cr
Ohayo-Mountain-Rd
368 m
S n a k e R o c k s
Yerry Hill Rd
O H A Y O M O U N T A I N
Glenford-Wittenberg Rd
High Rocks Rd
423 m
Spencer Rd
400 m
Walton Rd
300 m
Boyce Rd
Old Rt 28
13
12
Bnst Yoi Hill Rd
28
Kenozia Lake Rd
14
Kenozia Lake
Boulevard Rd
28
15
Ashokan Reservoir
0 0.1750.35 0.7 1.05 1.4
Miles
Vinegar Hill Rd
28A
Spillway Rd
Legend
Non-Class Specific Defects
Debris
Class 1 Defects
Mileposts
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community


Defect Locations
N
Pitcairn Rd
765 m
Tonshi Mountain
607 m
Little Tonshi Mountain
553 m
Peck Rd
Chase Rd
Kenoza Lake Rd
Dubois Rd
Tonshi Ter
Bostock Rd
Black Rd
Ridge Rd
Mountain Rd
Shokan
28
15
16
17
18
Reservoir Rd
Ashokan Reservoir
Monument Rd
28A
Esopus Creek
Beaverkill Rd
Olivebridge
0 0.175 0.35 0.7 1.05 1.4
Miles
Legend
Non-Class Specific Defects
Debris
Class 1 Defects
Mileposts
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community


Defect Locations
N
23
22
21
20
19
18
Boiceville
Cold Brook Rd
Piney Point Rd
Bostock Rd
Peck Rd
Dancing Rock Rd
Black Rd
Upper Boiceville Rd
Esopus Creek
28
28A
0 0.175 0.35 0.7 1.05 1.4
Miles
Legend
Non-Class Specific Defects
Debris
Class 1 Defects
Mileposts
Ashokan Reservoir
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community


Defect Locations
N
Phoenicia
Main St
Bridge St
28
27
26
25
24
23
22
Esopus Creek
Mount Pearl Rd
Mardstone Dr
Old Rt 28
Miller Rd
Mt Tremper
Wittenberg Rd
212
Huddler Cemetery
Pleasant Rural Cemetery
Winnie Rd
Piney Point
Bradken Rd
TREMPER MOUNTAIN
Mount Pleasant
Mountain
829 m
857 m
763 m
603 m
0 0.175 0.35 0.7 1.05 1.4
Miles
Legend
Non-Class Specific Defects
Debris
Class 1 Defects
Mileposts
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Appendix B
Typical Conditions

Example of a washout along a riverbank. One possible mechanism for such a failure is stormwater runoff infiltrating into the roadbed. With the added weight, the soil becomes unstable and shifts. Warning signs of such conditions include observing track surface and alignment irregularities. Best practices to prevent such failures include maintaining ditches and culverts to allow surface water to flow away from the roadbed.

Example of a center-cracked joint bar. Such a defect is not permitted in Class 1 track as described in Title 49, Part 213, Section 121, Paragraph (b). This photograph was taken in an area that currently does not experience train operations. Proper remedial action includes replacing the cracked joint bar.

Example of a joint tie defect. According to Title 49, Part 213, Section 109, Paragraph (e), rail joints must be supported by one (1) crosstie that meets the specifications in paragraphs (c) and (d) of this section within 24” of the center of the joint. The three (3) ties within this envelope do not meet the specifications because they are broken through, split so ballast may work through, and are split so that the crosstie will not hold rail fasteners (spikes).

Example of typical vegetation conditions along sections of the Corridor that are not operated on. The Operating Lease requires that the corridor be free of brush, papers, and trash. In addition, Title 49, Part 213, Section 37 has requirements that vegetation be maintained. This example would hinder a railroad employee from performing their trackside duties (i.e. inspecting a passing train from the side of the tracks, walking along the side of a train, or clearing the tracks for a passing train).

Example of a fouled ballast condition caused by poor drainage. Title 49, Part 213, Section 33 requires that each drainage or other water carrying facility under or immediately adjacent to the roadbed be maintained and kept free of obstruction, to accommodate expected water flow for the area concerned. Since the ditches have become fouled with leaves and branches, water has accumulated in this area causing the roadbed to become saturated. If this section of track were to be operated on, this would be a hazard because the roadbed has less structural stability to maintain proper alignment and surface.

Example of a location where brush is growing within the right of way. White pines and other undergrowth are developing inside the gage of the track. This hinders a track inspector's ability to properly inspect track.

Example of tie piles left along the right of way. Ties should be disposed of at an approved facility.

Eastward photograph showing alignment deviations on both approaches of the C9 Bridge. HDR advised the County to cease operations over this bridge until the structure can be evaluated. HDR Track Inspectors observed that the concrete abutments have shifted.

Example of a washout which may have been caused by a blocked culvert. Allowing debris to build up around culverts can cause the drainage path to be redirected, causing the roadbed and ballast section to be washed out.

Location where a drainage or water carrying facility is not maintained to accommodate expected water flow. As stormwater accumulated, sediment deposited on the roadbed. Routine ditch maintenance would keep sediment from accumulating.

Example of debris accumulating in a ditch.

Example of a washout caused by a ditch becoming flooded from heavy rainfall. Stormwater that could not flow naturally to a culvert would flow laterally over the track structure, washing away ballast. The final result of this would leave the track in inoperable condition.

Example of a center-cracked joint bar with a joint tie defect. Center cracked joint bars can be caused by fatigue. Such fatigue may be caused by excessive bending stress. The intent of the joint tie regulations is to ensure that a joint is supported, thereby minimizing vertical bending stresses.

Example of a ditch where debris and sediment have accumulated over time. Note the trees that have grown in the area. Routine ditch maintenance ensures proper stormwater flow and prevents vegetation from growing and fouling the waterway.

Appendix C
Preliminary Reports

May 16, 2014

Mr. Chris White, Deputy Director
Ulster County Planning Department
244 Fair Street
Kingston, NY 12402

Re: Temporary Closure of the C9 Bridge, Pending a Structural Engineering Review

Dear Mr. White:

HDR conducted a walking track inspection to determine compliance with Title 49 Part 213 Class 1 and Non-Class Specific Standards on May 12, 2014 between Downs Street and Route 209.

HDR has identified two (2) issues which may potentially pose a hazard to railroad operations or the general public in the vicinity of the C9 Bridge. In order to ensure the safety of the general public, HDR recommends that operations cease until a Structural Engineering Review is completed.

Upon approaching the bridge, it was visually determined that there is an alignment deviation at the east approach of the through truss span of the bridge. An alignment deviation at such a location may indicate that the bridge superstructure is shifting. A more thorough inspection was conducted on May 15, 2014 and it was determined that the eastern retaining wall has cracked and shifted, allowing the roadbed to become unstable at the East Approach.

Additionally, HDR inspected the bridge deck and noted that the recently installed bridge timbers have shifted longitudinally. This shifting has allowed gaps exceeding 14 inches to form between bridge timbers. This would allow a person to be able to fall through the bridge deck, which fails to comply with OSHA regulation 1925.501(b)(4)(i) which states, "Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes."

Thank you for your prompt attention to this matter. If you have any additional questions please call me at (617) 357-7717.

Sincerely,

Owen Smith
Rail Engineer

Attachments

cc: Peter Reilly, HDR
Ken Briggs, HDR

hdrinc.com

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T 617.357.7700 F 617.357.7759

Photograph showing longitudinal shifting of a bridge timber, creating a condition where a person could fall through.

Photograph showing the eastern bridge abutment. The movement has allowed the roadbed to destabilize which is non-compliant with FRA Rule 213.103(a).

Eastward photograph showing the alignment deviations on both approaches.

May 20, 2014

Mr. Chris White, Deputy Director
Ulster County Planning Department
244 Fair Street
Kingston, NY 12402

Re: Identified Class 1 and Non-Class Specific Defects on the Catskill Mountain Railroad

Dear Mr. White:

HDR conducted a track inspection on the behalf of Ulster County to determine compliance with Title 49, Part 213, Class 1 and Non-Class Specific Standards on the Catskill Mountain Railroad (CMRR) between Downs Street in Kingston, NY and Bridge Street in Phoenicia, NY. Inspections were conducted on foot between May 12, 2014 and May 15, 2014. Identified defects were marked in yellow paint by the HDR inspectors. Listed in a table below are defects, which must be inspected by a person qualified under Title 49, Part 213, Subpart A, §213.7.

	Location			
Photo #	Latitude	Longitude	Defect Description	Defect Section
440	N 41d 55m 59.29s	W 74d 0m 33.73s	Insufficient ballast	§213.103(a)
455	N 41d 56m 13.00s	W 74d 1m 16.33s	Center cracked joint bar (jointed track)	§213.121(c)
497	N 41d 56m 32.21s	W 74d 2m 31.13s	Center cracked joint bar (jointed track)	§213.121(c)
1018	N 42d 2m 19.31s	W 74d 16m 54.47s	3-1/2" difference in crosslevel in 62 feet	§213.63(a)
1026	N 42d 2m 42.73s	W 74d 17m 11.56s	No effective support ties within the prescribed distance from a joint	§213.109(e)(1)
1027	N 42d 2m 41.92s	W 74d 17m 12.49s	No effective support ties within the prescribed distance from a joint	§213.109(e)(1)
1028	N 42d 2m 44.30s	W 74d 17m 13.83s	Improper fit between switch point and stock rail	§213.135(b)
1034	N 42d 2m 49.00s	W 74d 17m 16.97s	Loose joint bars (jointed track)	§213.121(f)
1047	N 42d 3m 15.41s	W 74d 17m 38.46s	No effective support ties within the prescribed distance from a joint	§213.109(e)(1)
1050	N 42d 3m 19.75s	W 74d 17m 48.15s	No effective support ties within the prescribed distance from a joint	§213.109(e)(1)
1051	N 42d 3m 20.08s	W 74d 17m 47.94s	No effective support ties within the prescribed distance from a joint	§213.109(e)(1)
1059	N 42d 3m 28.25s	W 74d 18m 6.94s	No effective support ties within the prescribed distance from a joint	§213.109(e)(1)

Under FRA Rule §213.7(a), CMRR is required to designate a person qualified to supervise certain track renewals and inspect track. Such a person shall have at least:

- 1 year of experience in railroad track maintenance; or

- A combination of supervisory experience in track maintenance and training from a course in track maintenance or from a college level education program related to track maintenance.

In addition the individual must demonstrate to the owner that he or she:

- Knows and understands the requirements of Title 49, Part 213 that apply to the restoration and renewal of the track for which he or she is responsible;
- Can detect deviations from the requirements of Title 49, Part 213; and,
- Can prescribe appropriate remedial action to correct or safely compensate for those deviations.

Thank you for your attention to this matter. Additional FRA Class 1 and Non-Class Specific defects in areas that currently do not have passenger operations will be provided in a future report. If you have any questions, please contact me at (617) 357-7700.

Sincerely,

Owen Smith
Rail Engineer

Attachments

cc: Peter Reilly, HDR
Ken Briggs, HDR
Neil Kollios, HDR

Photo # 440

Photo # 455

Photo # 497

Photo # 1018

Photo # 1026

Photo # 1027

Photo # 1028

Photo # 1034

Photo # 1047

Photo # 1050

Photo # 1051

Photo # 1059