

# APPENDIX A:

## Shasta River Watershed Delineation

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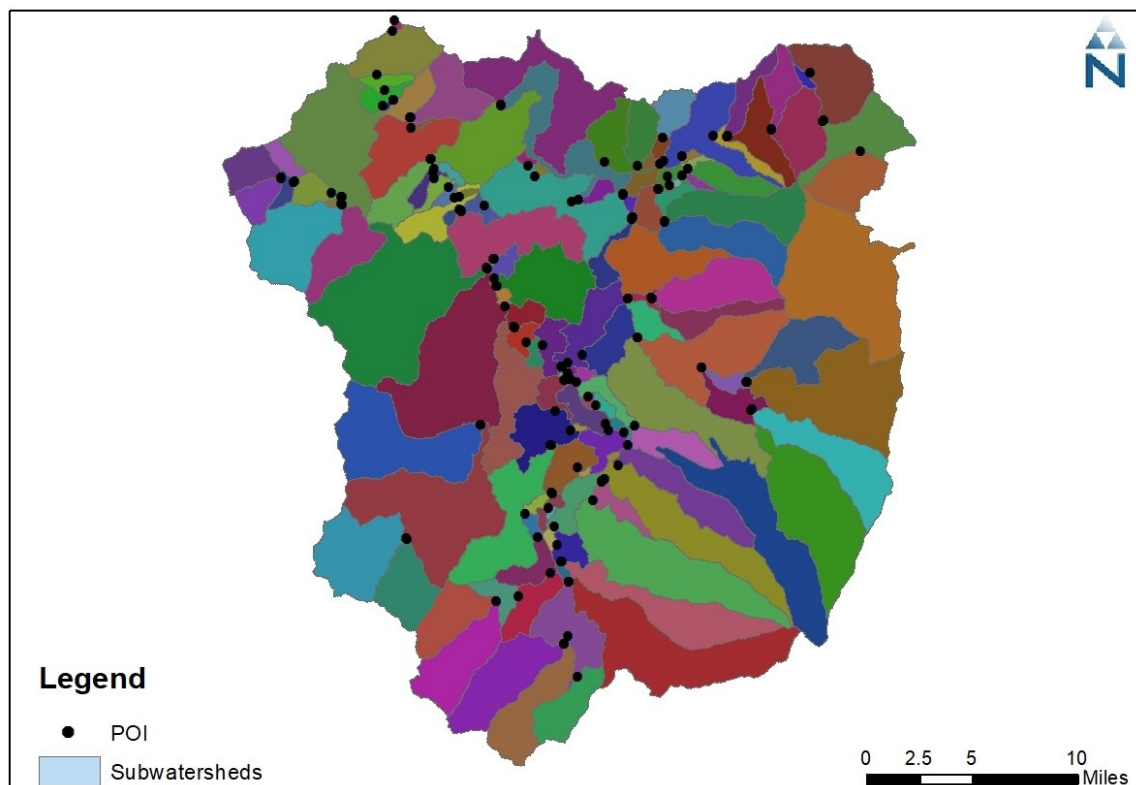
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Overall, the initial subwatershed delineation (before adjusting for tailwater conditions) resulted in 141 subwatersheds including outlets for all the selected POI and preserved stream connectivity and routing requirements for the model (Figure A-1). However, there were a few notable outcomes, which can be summarized into four groups as follows:

1. Cases where the POI remained at the same locations as provided by State Water Board
2. Cases where multiple POI were located very close to each other, creating tiny subwatersheds. These POI were combined with adjacent POI, resulting in a single subwatershed
3. Cases where the POI locations were offline from the stream network. These POI were either moved to a nearby tributary/river according to their description, or a nearby POI on the stream network was selected as the representative POI, and
4. Cases where the POI appear to be very far from primary flow lines, resulting in zero acreage subwatersheds. These points were removed from the watershed delineation analysis.

The following subsections correspond to these four groups of outcomes. They include tabular summaries, and where applicable, some example maps.



**Figure A-1. Shasta DRAFT Subwatersheds.**

### Case 1: Same Locations as Provided by the State Water Board

Some POI were originally located on a stream segment, resulting in a reasonable subwatershed. Table A-1 summarizes a list of POI that remained at the same locations as were provided by the State Water Board.

**Table A-1. Case 1 POI.**

POI Priority	POI Name	POI Type	Comment	Case
1	D_EdsonFoulke_1	Diversion	Same location	Case 1
1	D_EdsonFoulke_2	Diversion	Same location	Case 1
1	D_ParksCreek_2	Diversion & Impound	Same location	Case 1
1	F_BigSpringsCreek_1	Flow	Same location	Case 1
1	F_HammondRes	Flow	Same location	Case 1
1	F_LittleShastaRiver_1	Flow	Same location	Case 1
1	F_LittleSpringsCreek_1	Flow	Same location	Case 1
1	F_YrekaCreek	Flow	Same location	Case 1
1	G_MWCD_ParksCrk_Diverion_Edgewood	Gage	Same location	Case 1
1	G_ParkCrk_Blw_MWVD_Diverion_Edgewood	Gage	Same location	Case 1
1	G_SHASTA_NR_EDGEWOOD_Inactive	Gage	Same location	Case 1
1	G_SHASTA_MONTAGUE	Gage	Same location	Case 1
1	G_SHASTA_NR_GRENADA_Flow	Gage	Same location	Case 1
1	I_ParksCreek_1	Impoundment	Same location	Case 1
1	S_BullMeadow	Spring	Same location	Case 1
2	G_Dwinnei	Gage	Same location	Case 1
2	G_Dwinnei_InstreamFlowRelease	Gage	Same location	Case 1
2	G_Dwinnei_reservoir_Edgewood	Gage	Same location	Case 1
2	G_Dwinnei_SeepageWeir	Gage	Same location	Case 1
2	G_LITTLE_SHASTA_NR_MONTAGUE_15MIN	Gage	Same location	Case 1
2	G_LITTLE_SHASTA_NR_MONTAGUE_daily	Gage	Same location	Case 1
2	G_ParkCrk_NR_BigSprings	Gage	Same location	Case 1
2	G_ParkCrk_NR_EDGEWOOD	Gage	Same location	Case 1
2	G_SHASTA_AT_GRENADA_PUMP_PLANT	Gage	Same location	Case 1
2	G_SHASTA_NR_EDGEWOOD_Active	Gage	Same location	Case 1
2	G_SHASTA_ABV_CTY_RD A-12_NR_GRENADA	Gage	Same location	Case 1
2	G_SHASTA_Blw_CTY_RD A-12_NR_GRENADA	Gage	Same location	Case 1
2	G_SHASTA_HWY3_MONTAGUE	Gage	Same location	Case 1
2	G_SHASTA_NR_GRENADA_Stage	Gage	Same location	Case 1
2	G_Shasta_Yreka	Gage	Same location	Case 1

POI Priority	POI Name	POI Type	Comment	Case
2	G_ShastaCrossCanalWeir	Gage	Same location	Case 1
2	G_YrekaCrk_AndersonGradeRd	Gage	Same location	Case 1
2	I_ShastaRiver_12	Impoundment	Same location	Case 1
2	I_BigSprings_1	Impoundment	Same location	Case 1
2	I_LittleShasta_1	Impoundment	Same location	Case 1
2	I_LittleShasta_2	Impoundment	Same location	Case 1
2	I_LittleShasta_4	Impoundment	Same location	Case 1
2	I_LittleShasta_8	Impoundment	Same location	Case 1
2	I_LittleShasta_9	Impoundment	Same location	Case 1
2	I_ShastaRiver_7	Impoundment	Same location	Case 1
2	I_ShastaRiver_8	Impoundment	Same location	Case 1
2	S_Bridgefield_1	Spring & Impoundment	Same location	Case 1

## Case 2: Combined with Adjacent Points

There were some POI that were closely and concurrently located along or nearby a stream segment, resulting in a tiny subwatershed. Table A-1 summarizes a list of Case 2 POI. The “Comment” column in Table A-1 clarifies changes made to each POI. Most of these POI locations are springs and impoundments. Although the POI locations represent the physical location of springs and impoundments there appears to be very little difference in the computed upstream drainage area for those POI. Therefore, the adjacent points were combined to eliminate the small connecting subwatersheds. From a modeling perspective, the upstream drainage areas are not very different; therefore, pending no other hydromodification impacts, comparing data at those points to the same model outlet will yield a comparison that is well within any reasonable range of model predictions. Figure A-1, Figure A-2, and Figure A-3 represent three examples for Case 2 for springs, tailwaters, and impoundments, respectively.

**Table A-1. Case 2 POI.**

POI Priority	POI Name	POI Type	Comment	Case
1	S_LittleShastaSprings_1	Spring	Combined with S_LittleShastaSprings_2, and S_LittleShastaSprings_3	Case 2
1	S_LittleShastaSprings_2	Spring	Combined with S_LittleShastaSprings_1, and S_LittleShastaSprings_3	Case 2
1	S_LittleShastaSprings_3	Spring	Combined with S_LittleShastaSprings_2, and S_LittleShastaSprings_1	Case 2
1	T_HoleInTheGround_1	Tailwater	Combined with S_HoleIntheGround_1 and moved to the confluence of Hole in the Ground River	Case 2

POI Priority	POI Name	POI Type	Comment	Case
2	I_ShastaRiver_1	Impound or Diversion	Combined with G_Dwinnei_InstreamFlowRelease	Case 2
2	I_ParksCreek_2	Impoundment	Combined with S_BlackMeadow_2	Case 2
2	I_ShastaRiver_13	Impoundment	Combined with S_JimSpring	Case 2
2	I_LittleShasta_11	Impoundment	Combined with S_LittleShasta_45	Case 2
2	I_ShastaRiver_4	Impoundment	Combined with G_SHASTA_ABV_CTY_RD A-12_NR_GRENADA	Case 2
2	I_ShastaRiver_5	Impoundment	Combined with G_SHASTA_ABV_CTY_RD A-12_NR_GRENADA	Case 2
2	I_ShastaRiver_9	Impoundment	Combined with I_ShastaRiver_8	Case 2
2	S_KettleSprings_1	Spring & Impoundment	Combined with S_KettleSprings_2	Case 2

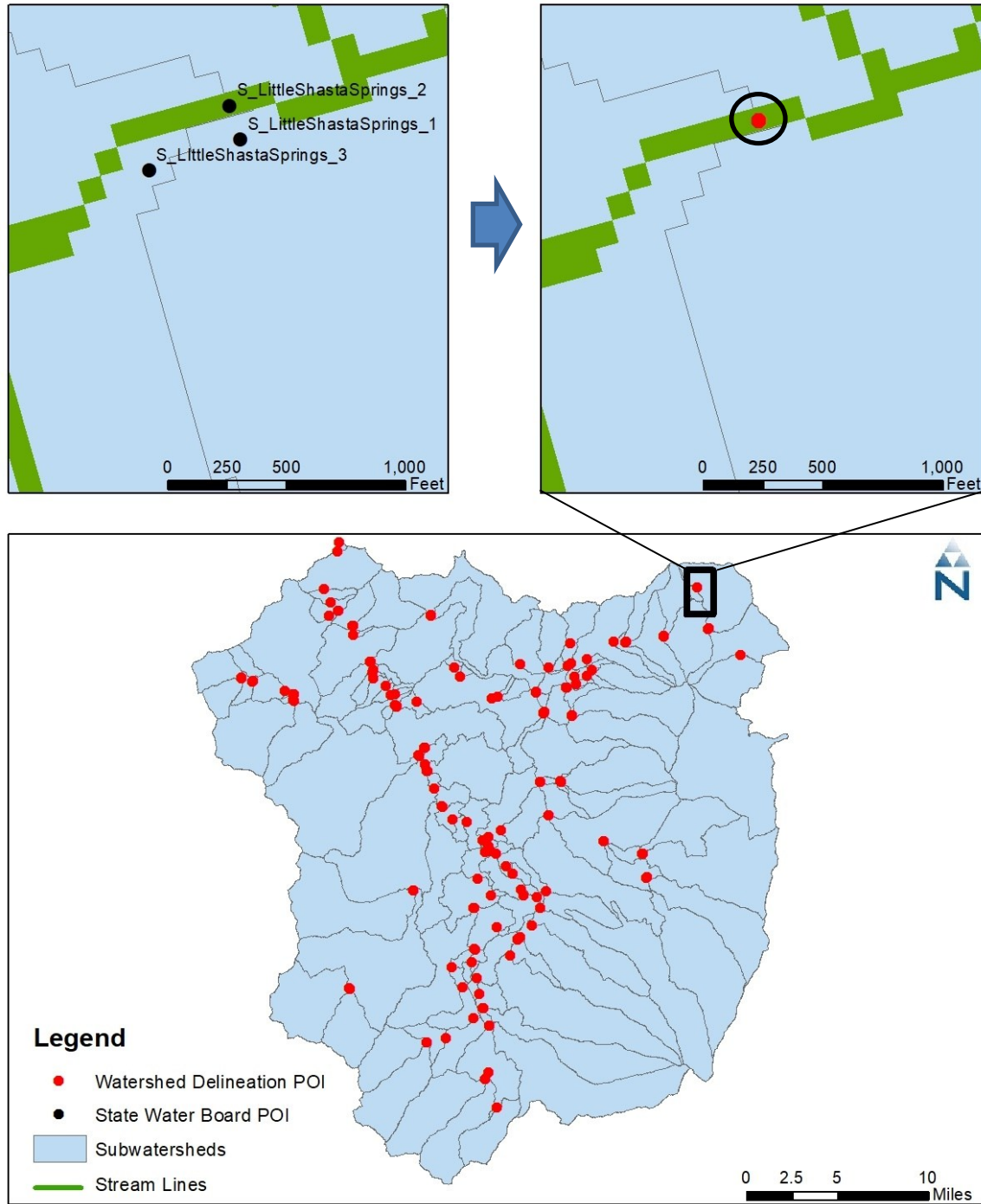


Figure A-1. Case 2, Example 1: S\_LittleShastaSprings\_1 was Combined with S\_LittleShastaSprings\_2, and S\_LittleShastaSprings\_3.

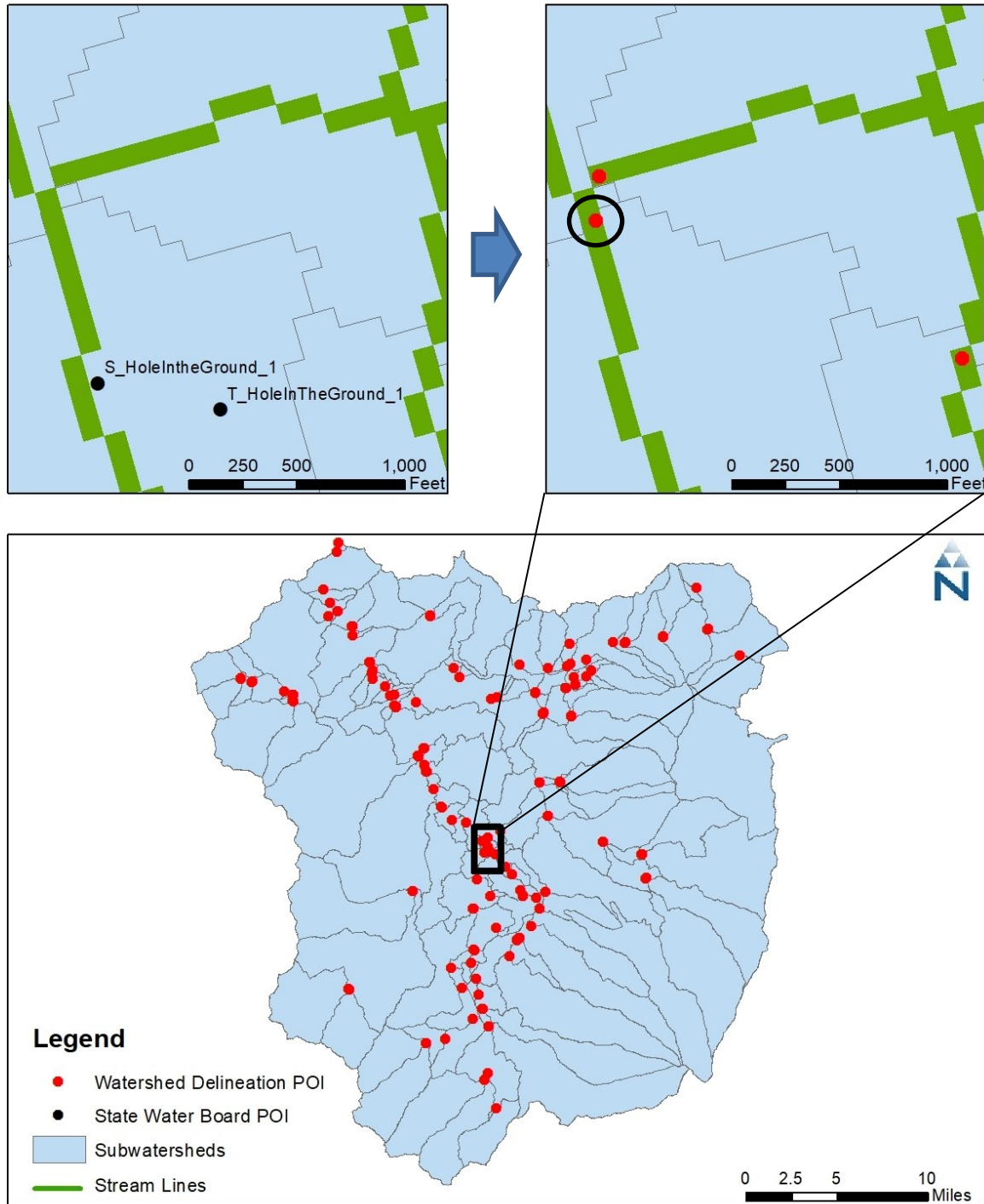


Figure A-2. Case 2, Example 2: T\_HoleInTheGround\_1 was Combined with S\_HoleInTheGround\_1 and moved to the confluence of Hole in the Ground River.



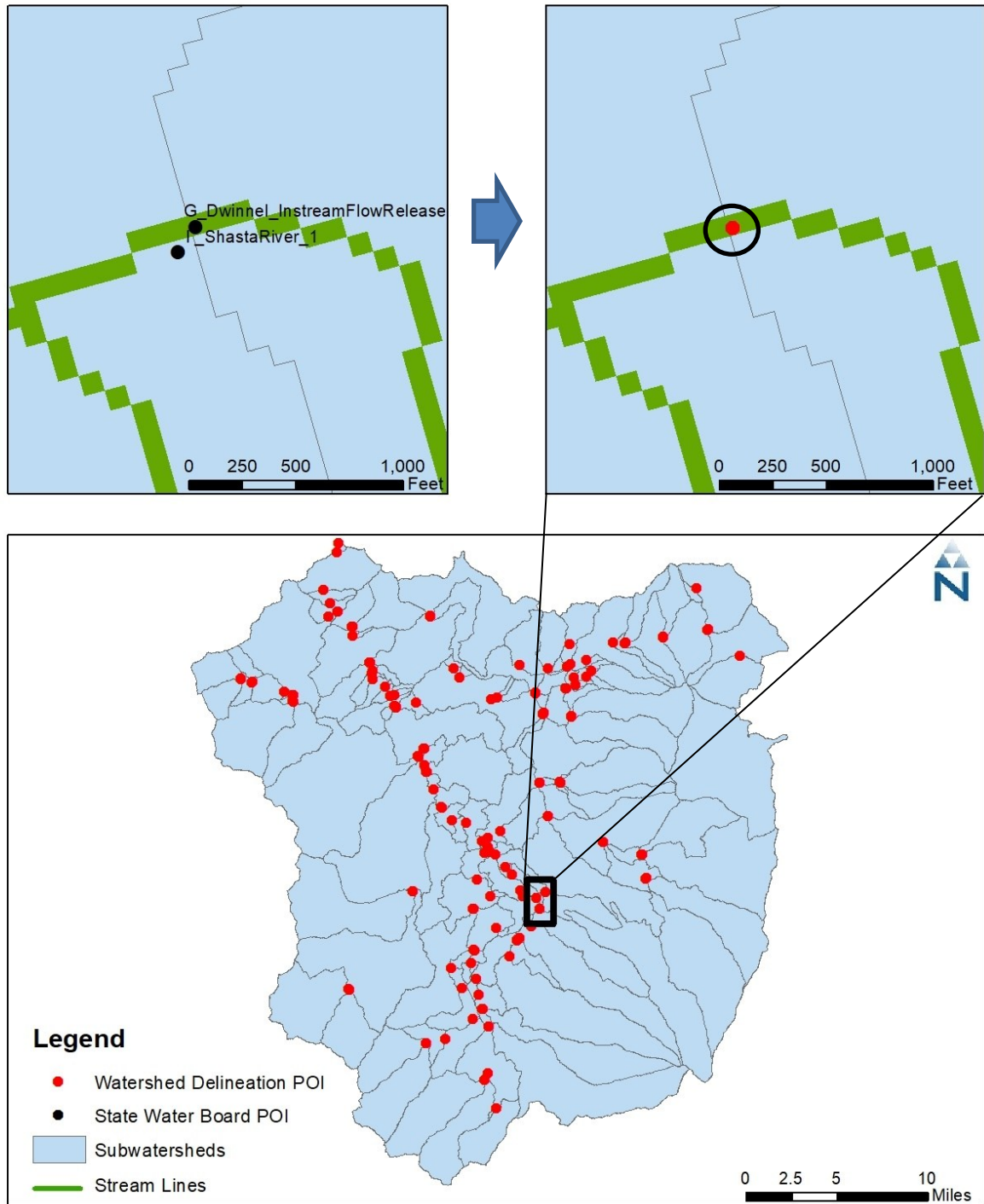


Figure A-3. Case 2, Example 3: I\_ShastaRiver\_1 was Combined with G\_Dwinnei\_InstreamFlowRelease.

### Case 3: POI Locations Nearby the Stream Network

Some POI were located offline from the stream network, but within a reasonable distance from a major stream line. Some of these POI are gages, while others are springs and impoundments. Areal imagery along with POI descriptions were used to relocate gages to a nearby stream. Most of the impoundments and springs appear to be located offline of streams on aerial imagery, therefore, a nearby point on a stream was selected as a representative POI. Table A-1 summarizes a list of Case 3 POI, with explanation of changes made to POI ("Comment" column). Figure A-1, Figure A-2, and Figure A-3 display three examples for Case 3 POI.

**Table A-1. Case 3 POI.**

POI Priority	POI Name	POI Type	Comment	Case
1	D_ParksCreek_1	Diversion & Impound	A nearby point on the stream network was selected as one POI, another POI added to Parks Creek to account for diversion from Parks Creek	Case 3
1	F_GarrickCreek	Flow	A nearby point on Garrick Creek was selected as the POI	Case 3
1	F_OregonSlu	Flow	Moved to the mouth of Oregon Slu River	Case 3
1	F_ParksCreek_1	Flow	Based on the description, the point was moved to the mouth of Parks Creek	Case 3
1	F_SalmonHeaven	Flow	Moved to Shasta River	Case 3
1	G_PARKS_DIV_TO_S HASTA_NR_ EDGEWOOD	Gage	A nearby point on Shasta River, upstream of Beaughton Creek confluence	Case 3
1	I_ShastaRiver_11	Impoundment	Moved to the nearby tributary to Shasta River	Case 3
1	I_ShastaRiver_3	Impoundment	A nearby point on the stream network was selected as the POI	Case 3
1	I_YrekaCreek_1	Impoundment	Moved to the nearby tributary to Shasta River	Case 3
1	I_ShastaRiver_2	Impoundment & Spring	A nearby point on Shasta River was selected as the POI	Case 3
1	S_BasseySpring	Spring	A nearby point on the stream network was selected as the POI	Case 3
1	S_BlackMeadow_2	Spring	A nearby point on the stream network was selected as the POI	Case 3
1	S_ClelandSpring_2	Spring	A nearby point on the stream network was selected as the POI	Case 3
1	S_HoleInTheGround_2	Spring	Moved to Hole in the Ground Creek	Case 3
1	S_JimSpring	Spring	A nearby point on the stream network was selected as the POI	Case 3
1	S_KettleSprings_2	Spring	A nearby point on the stream network was selected as the POI	Case 3
1	S_LittleShasta_41	Spring	A nearby point on Table Rock Creek was selected as a POI	Case 3

POI Priority	POI Name	POI Type	Comment	Case
1	S_MartinSpring	Spring	A nearby point on the stream network was selected as the POI	Case 3
1	S_HoleInTheGround_1	Spring & Tailwater	moved to the mouth of Hole in the Ground Creek, upstream of Shasta River	Case 3
2	I_HoleInTheGround_1	Culvert & Impoundment	A nearby point on Hole in the Ground Creek was selected	Case 3
2	D_ShastaRiver_1	Diversion & Impound	Moved to Shasta River	Case 3
2	I_ShastaRiver_14	Impoundment	A nearby point on a tributary to Little Shasta River was selected	Case 3
2	I_LittleShasta_10	Impoundment	Moved to tributary to Little Shasta River	Case 3
2	I_LittleShasta_5	Impoundment	Moved to the tributary to Little Shasta River	Case 3
2	I_LittleShasta_6	Impoundment	Moved to the tributary to Little Shasta River	Case 3
2	I_LittleShasta_7	Impoundment	Moved to Little Shasta River	Case 3
2	I_ShastaRiver_10	Impoundment	A nearby point on Shasta River was selected as the POI	Case 3
2	I_ShastaRiver_6	Impoundment	a nearby point on the tributary to Shasta was selected	Case 3
2	S_BlackMeadow_1	Spring & Impoundment	Moved to the tributary to Parks Creek	Case 3

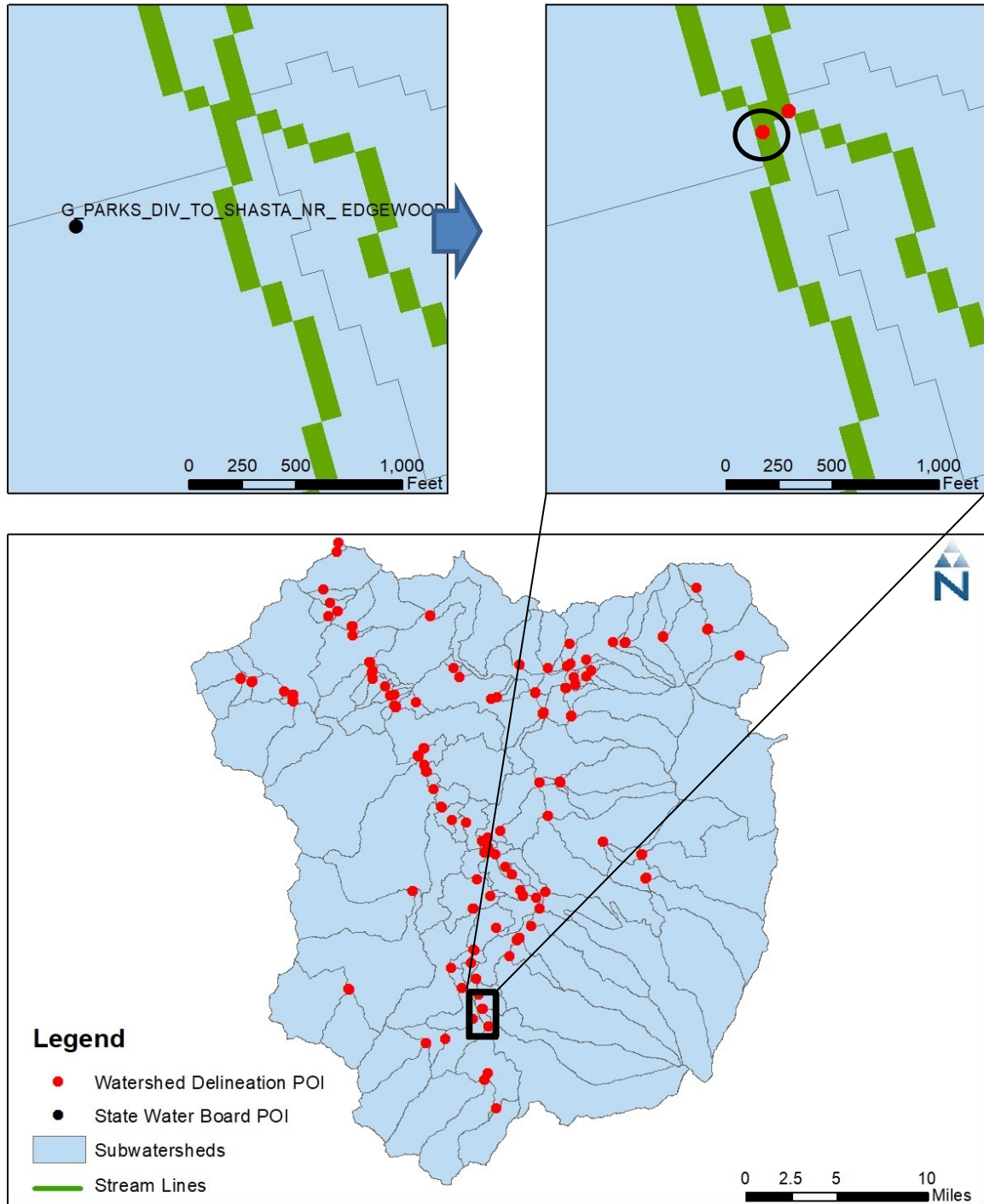


Figure A-1. Case 3, Example 1: G\_PARKS\_DIV\_TO\_SHASTA\_NR\_EDGEWOOD was replaced with a nearby point on Shasta River, upstream of Beaughton Creek confluence.

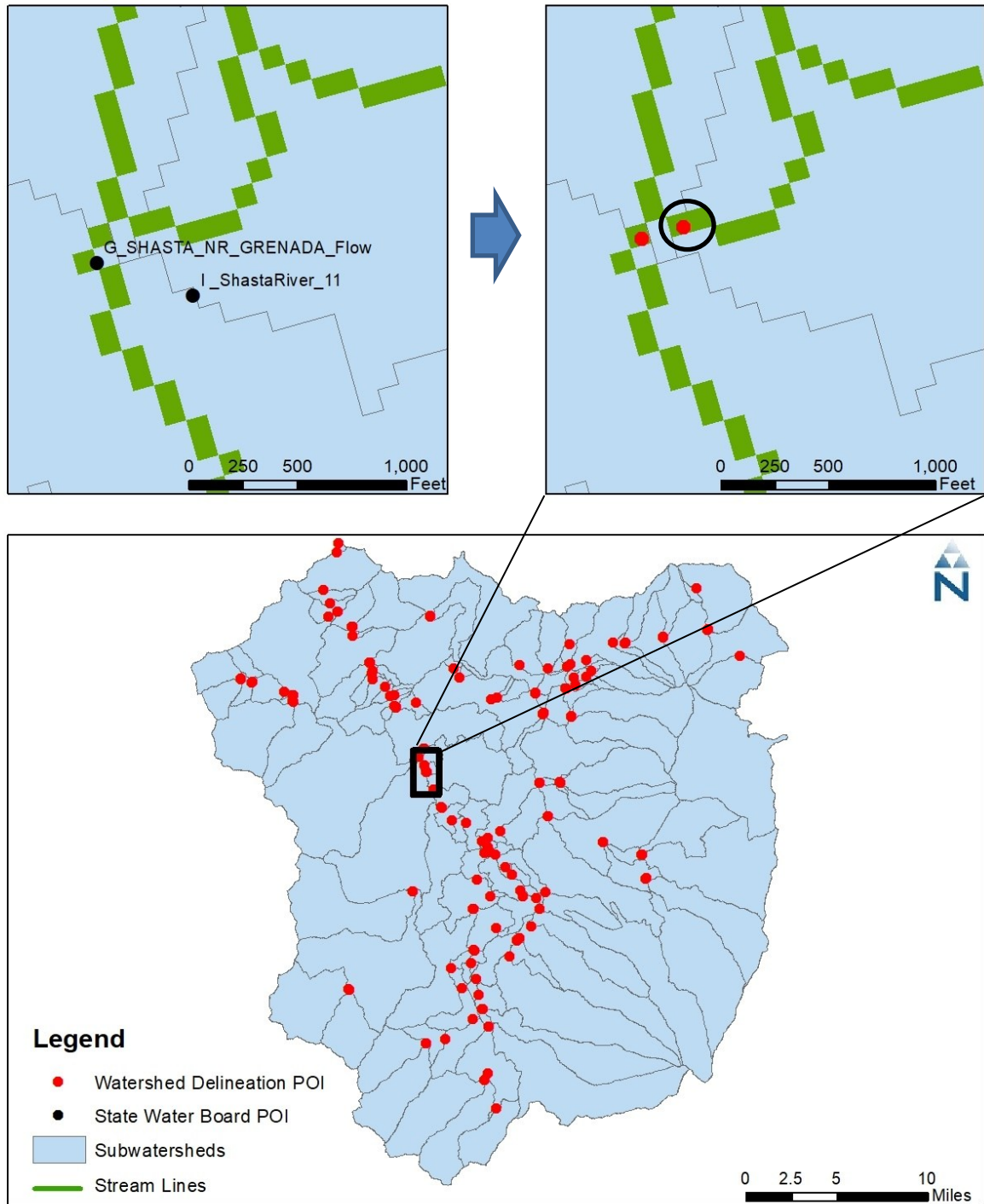
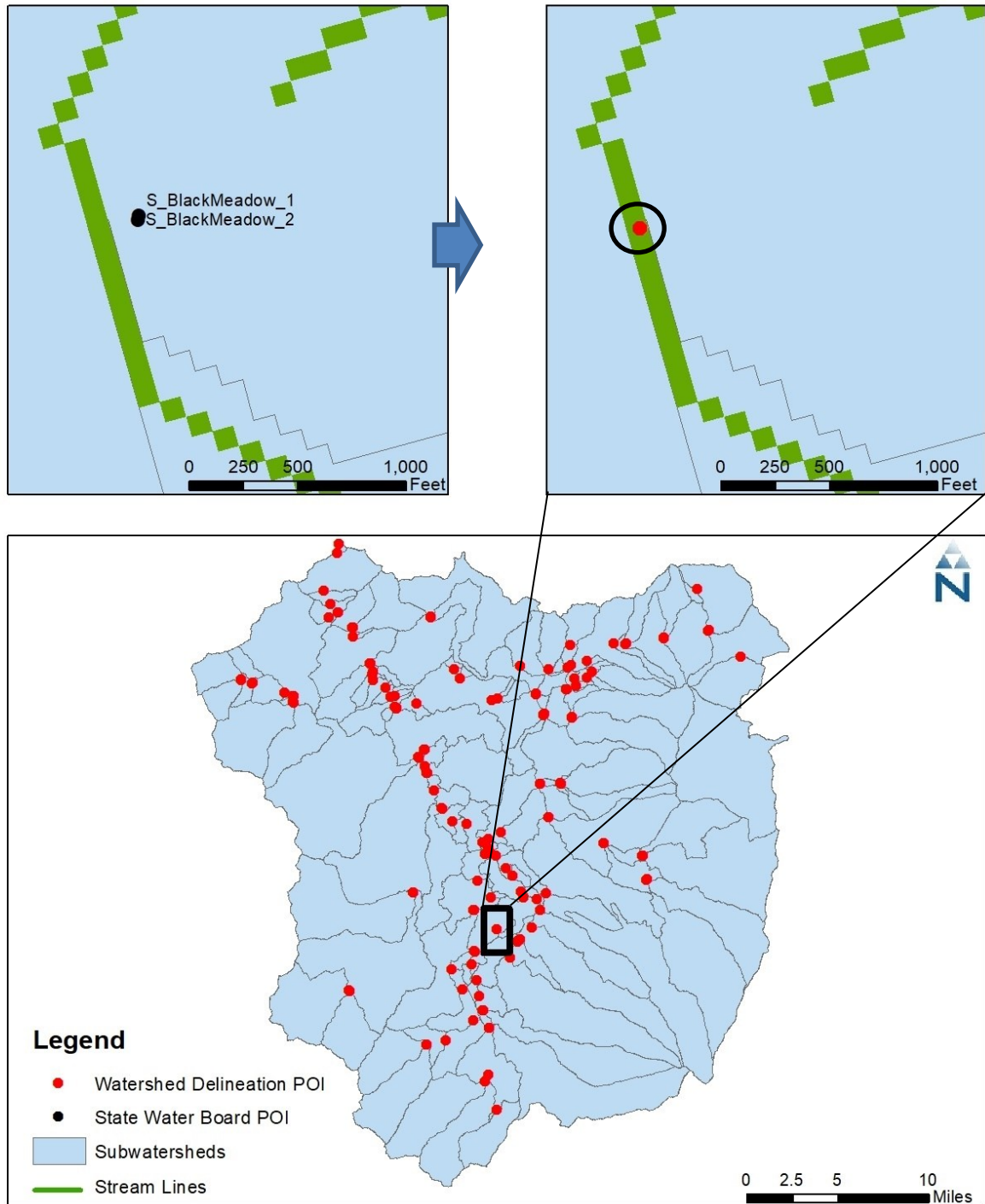


Figure A-2. Case 3, Example 2: I\_ShastaRiver\_11 was moved to the nearby tributary to Shasta River.





**Figure A-3. Case 3, Example 3: S\_BlackMeadow\_2 was moved to the nearby tributary to Parks Creek.**

### Case 4: POI Locations Offline from the Stream Network

There were six cases where POI locations were not on or nearby any minor or major stream lines, resulting in zero acreage drainage areas. These POI were removed from this watershed delineation analysis. However, Case 4 POI will be added to the watershed delineation analysis, once their locations are verified by the State Water Board. Please verify the POI locations listed in Table A-1. Figure A-28, and Figure A-39 display two examples for Case 4 POI.

**Table A-1. Case 4 POI.**

POI Priority	POI Name	POI Type	Comment	Case
1	S_BridgeField_2	Spring	Removed - not located on or nearby any stream lines	Case 4
2	I_LittleSpringsCreek_1	Culvert & Impoundment	Removed - not located on or nearby any stream lines	Case 4
2	I_LittleSpringsCreek_2	Culvert & Impoundment	Removed - not located on or nearby any stream lines	Case 4
2	I_LittleSpringsCreek_3	Culvert & Impoundment	Removed - not located on or nearby any stream lines	Case 4
2	I_LittleShasta_3	Impoundment	Removed - not located on/nearby any stream lines	Case 4
2	I_ParksCreek_2	Impoundment ?	Removed due to lack of description	Case 4

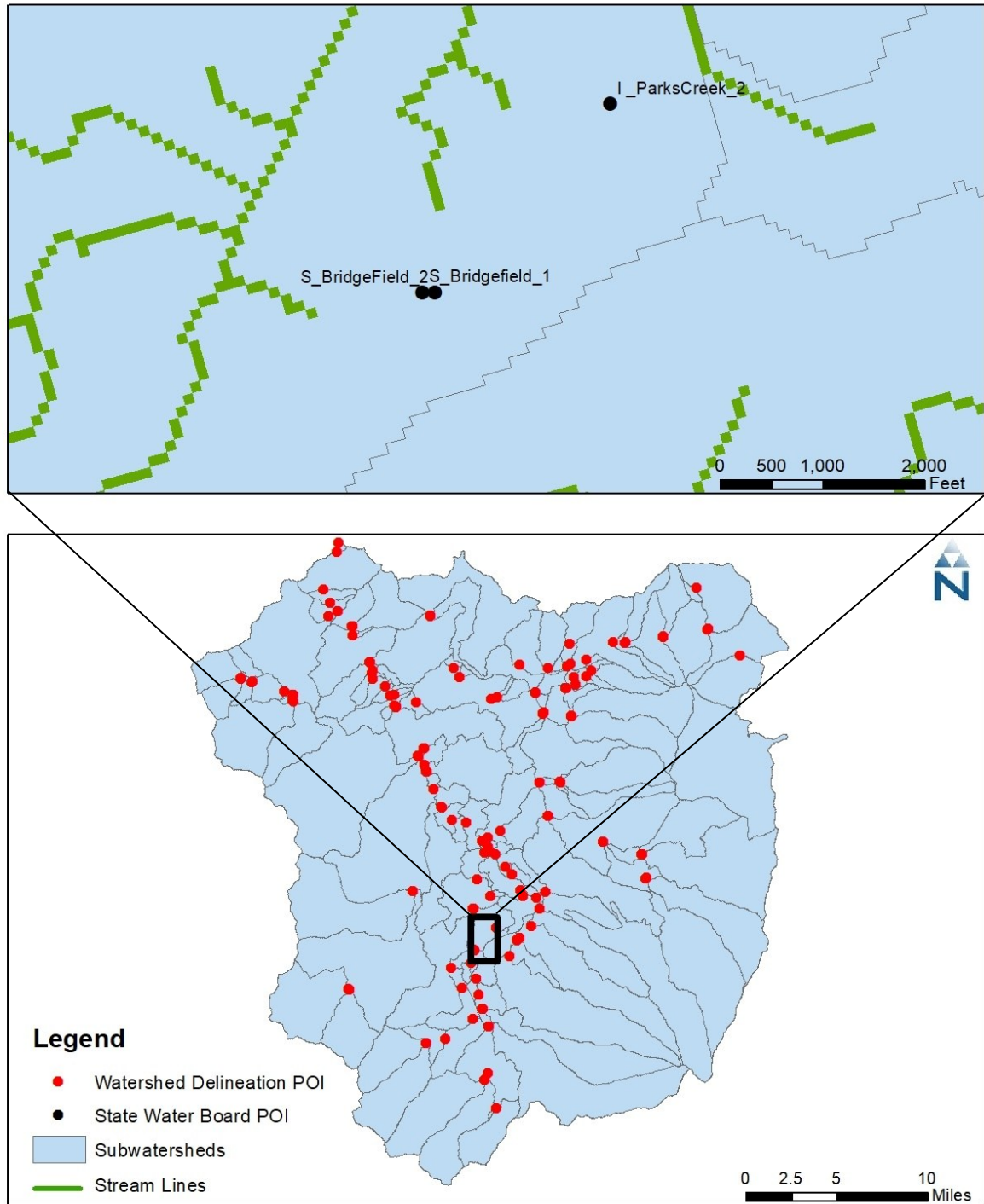


Figure A-1. Case 4, Example 1: S\_BridgeField\_2 and I\_ParksCreek\_2 were removed from the POI list.



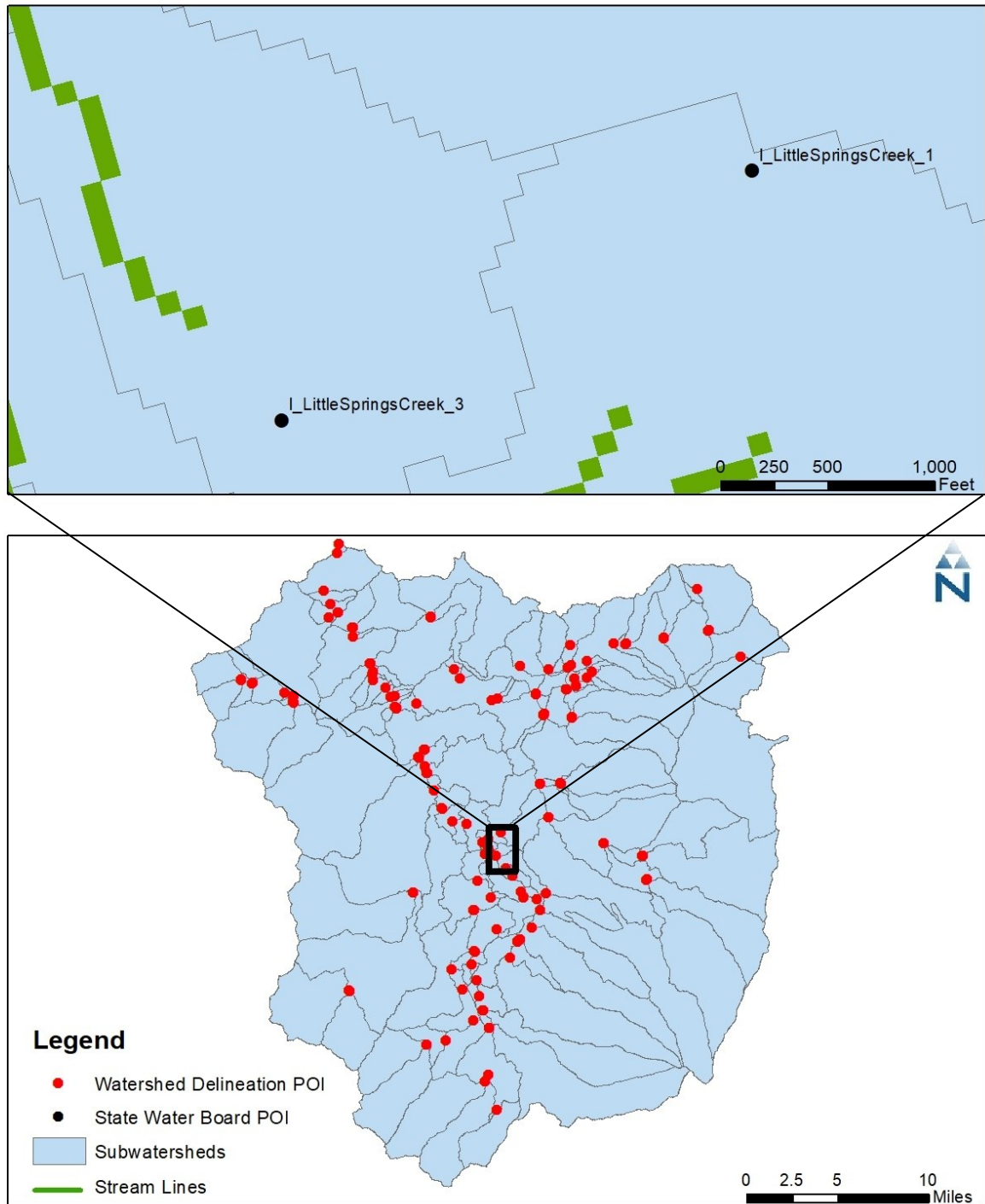


Figure A-2. Case 4, Example 2: I\_LittleSpringsCreek\_1 and I\_LittleSpringsCreek\_3 are removed from the POI list.