ESRI_UC_2015_No843_Integrating Flood Risk Management and Salmon Habitat Restoration_CampbellSW

Advancing an integrated approach to flood risk management and habitat restoration planning in the Puget Sound region of Washington, by identifying "early opportunities areas" where agencies can apply a coordinated investment approach to reduce flood risk and advance habitat restoration goals.

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DRAFT: 01 July 2015

Pilot Project Objectives

- Floodplains by Design
  - Identifying the floodplain areas with the highest potential to advance multiple benefits (i.e. flood risk reduction and habitat recovery);
  - Developing a tool to help project proponents secure critical support and funding; and
  - Initiating a multi-agency, coordinated investment approach to increase agency efficiency and effectiveness.

- Early Opportunities
  - Develop the tool to help project proponents secure critical support and funding
  - Prioritize specific floodplain project areas with the highest potential to advance multiple benefits (i.e., nonstructural FRM and salmon habitat)
  - Identify floodplains and floodplain managers for additional conferences
  - Identify potential overlap with existing GI and CG projects and/or potential marketable projects for PAS, FPMS, and CAP
  - Market tool to other watersheds (e.g., Missouri river)

Major Milestones & Deliverables

Accomplished

- Completed the kickoff meeting with stakeholders 30 July 2013
- Completed acquisition of 7 databases key to identifying floodplain connectedness and repetitive loss locations 15 November 2013
- Identified 10 high priority locations for FRM/salmon habitat
- Initiated economic analyses on targeted properties to quantify acquisition opportunities

Remaining:

- Complete analysis to determine most cost effective projects from an integrated ecosystem service and flood risk reduction perspective – Early May 2014
- Complete targeted floodplain managers' meetings – End May 2014
- Identify possible integration opportunities and connections to current USACE projects or other partner opportunities – End May 2014
- Measurable benefits document (funds expire) – 06 July 2014

Progress Toward Program Objectives

Overall

Addresses Expressed State Need

- Long term protection of natural and beneficial functions of Western WA floodplains

Leverages Resources (USACE Project Budget: $125K)

Agency	Investment
The Nature Conservancy	$100K
EPA National Estuary Program	$500K
FEMA	$55K
Puget Sound Partnership	$30K

Reduces/Manages Flood Risk

- Identifies high priority collocated restoration and FRM opportunities along PS rivers for inclusion in FbD program

Reduces Future Expenditures

- Facilitates greater integration/cost efficiencies across FED/State FRM/Ecorest programs

Results in Action by others

- Identifies agencies and funding sources suitable to the type project.

Tasks

- Update salmon projects from the Habitat Work Schedule and FEMA's Repetitive Loss and Severe Repetitive Loss properties to include properties acquired hazard mitigation programs
- "Ground truth" opportunity areas to identify places where it appears integrated actions could be pursued
- Conduct workshops or hold meetings with local floodplain managers and salmon recovery "lead entities" to identify projects of interest
- Conduct a socioeconomic analysis to determine which projects are most cost effective from an integrated ecosystem service and flood risk reduction perspective
- Identify possible integration opportunities and connections to other USACE projects
- Identify Silver Jacket partner programs that could support implementation of these projects

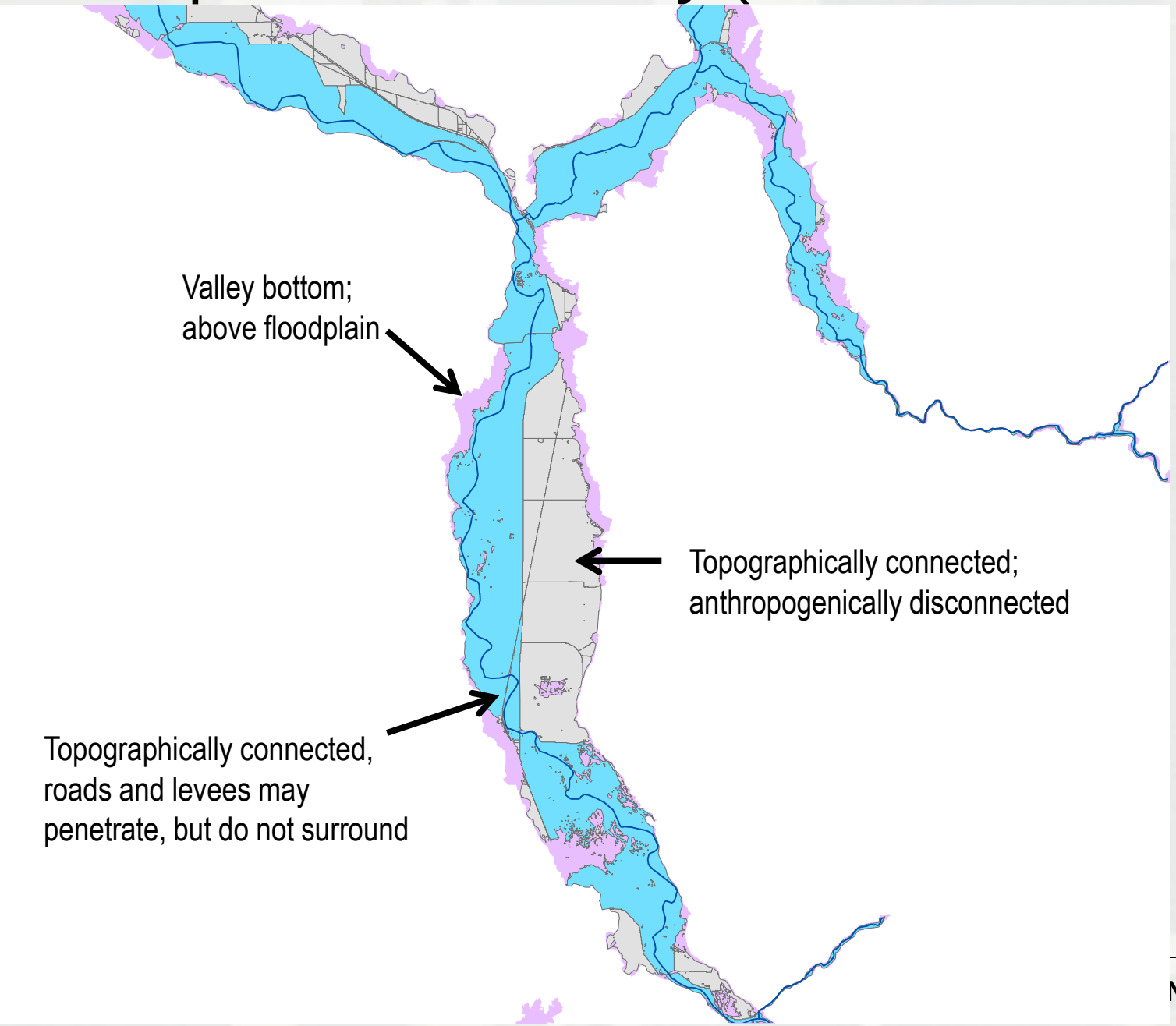
List of Priorities

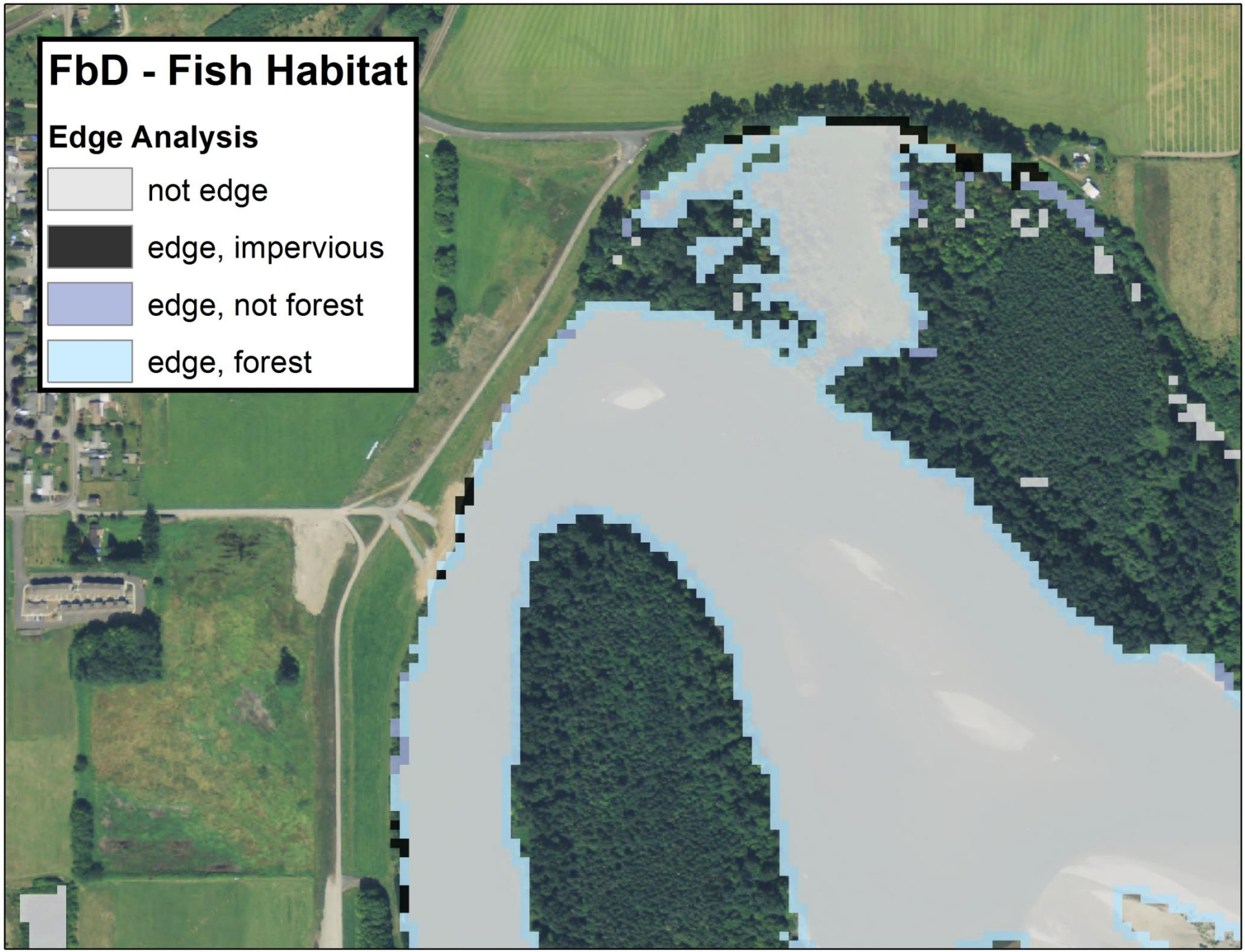
- Fish Habitat
  - ESA: Bull Trout, Steelhead, Chinook
  - Spawning Data: Bull Trout, Steelhead, Chinook
  - Proximity to wetlands
  - Floodplain connectivity
  - Water Quality (Impaired)
- Flood Risk Management
  - Repetitive loss locations
  - Floodplain connectivity
  - Flood damage claims

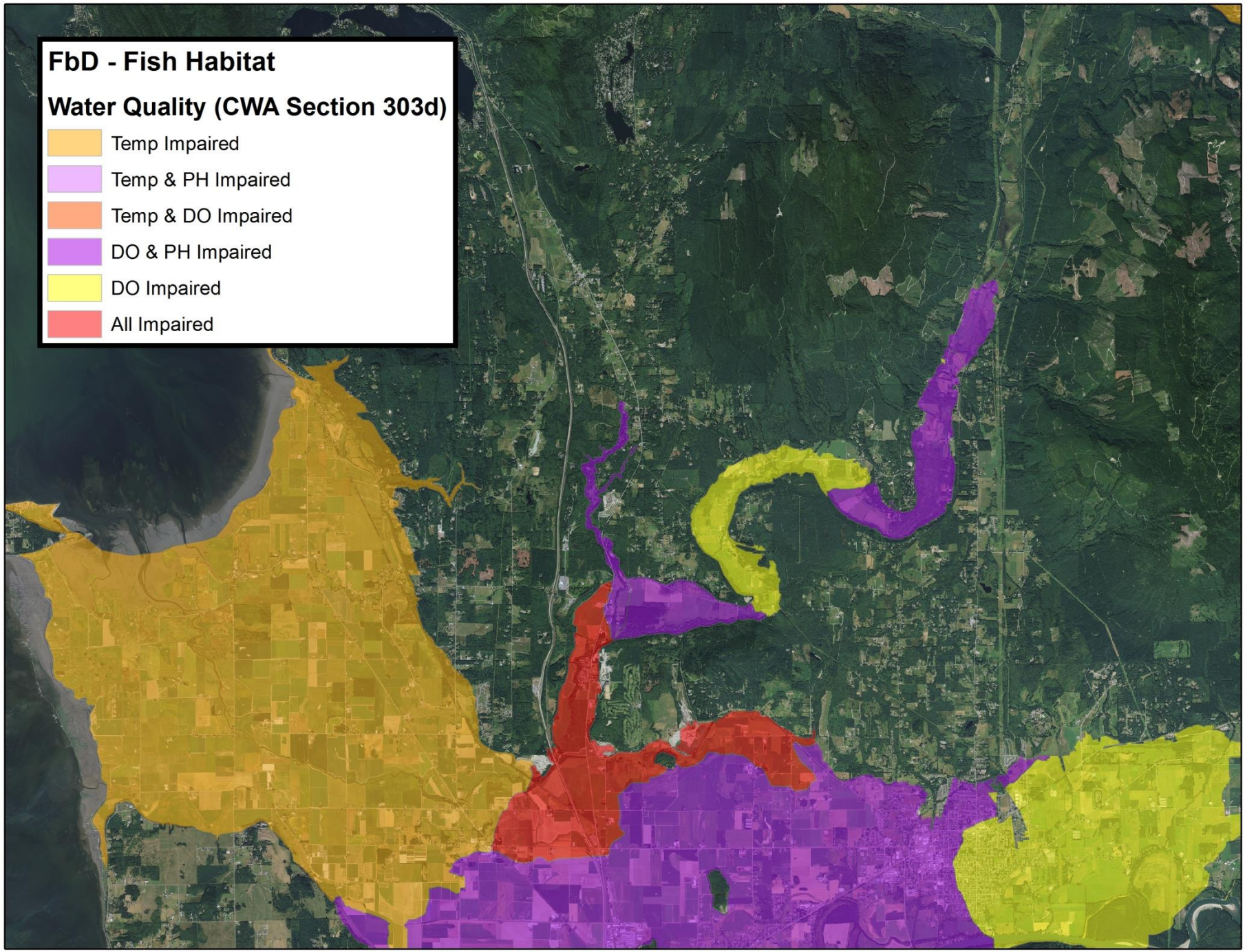
List of Data Sources

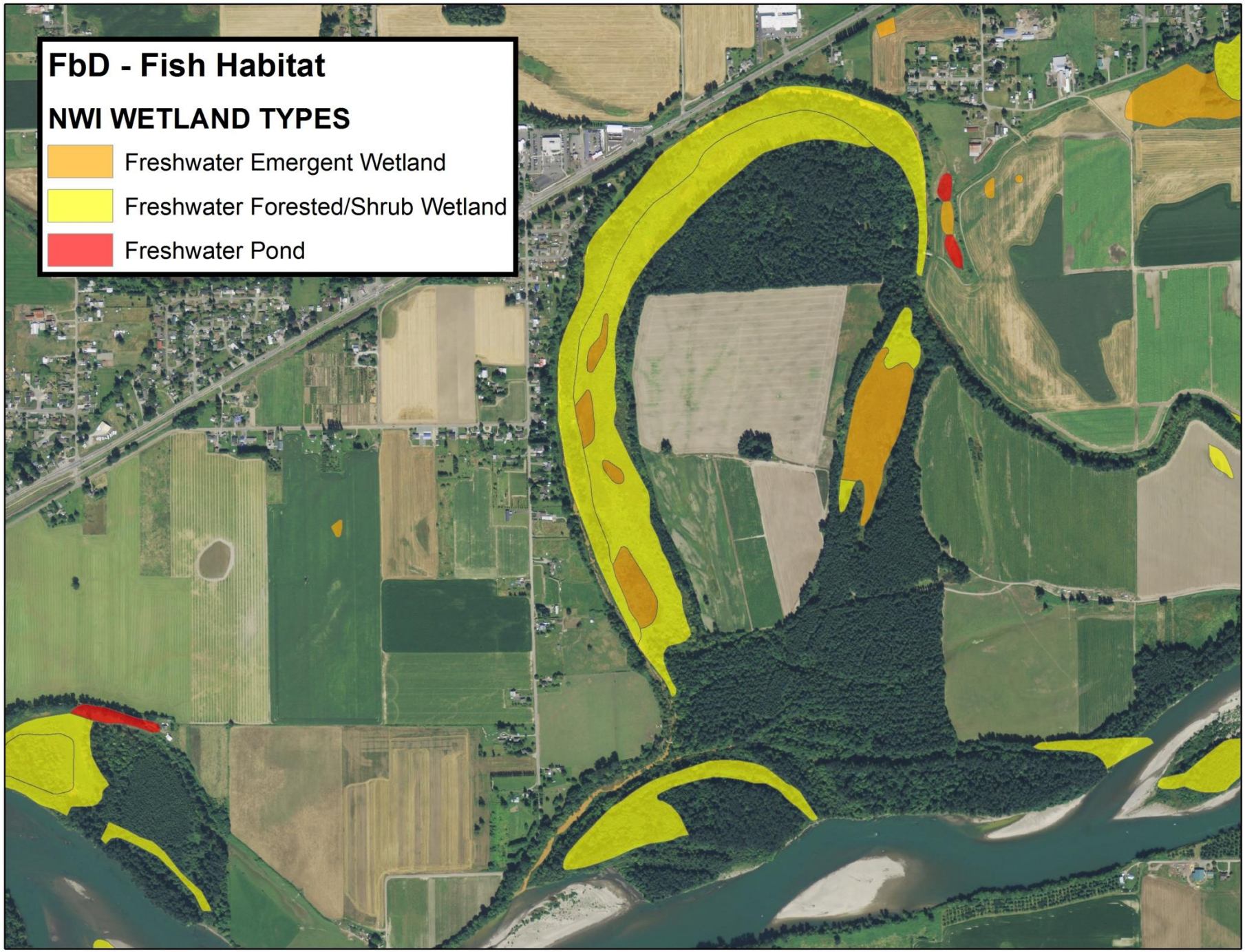
- Environmental
  - ESA: SSHIAP fish distribution (C. Konrad, USGS)
  - Spawning Data: Confirmed spawning (WDFW)
  - Proximity to wetlands: NWI wetlands (USFWS)
  - Floodplain connectivity (C. Konrad, USGS)
  - Water Quality: CWA Section 303d list (EPA)
- Flood Risk Management
  - Repetitive loss locations (FEMA)
  - Floodplain connectivity (C. Konrad, USGS)
  - Flood damage claims (FEMA)

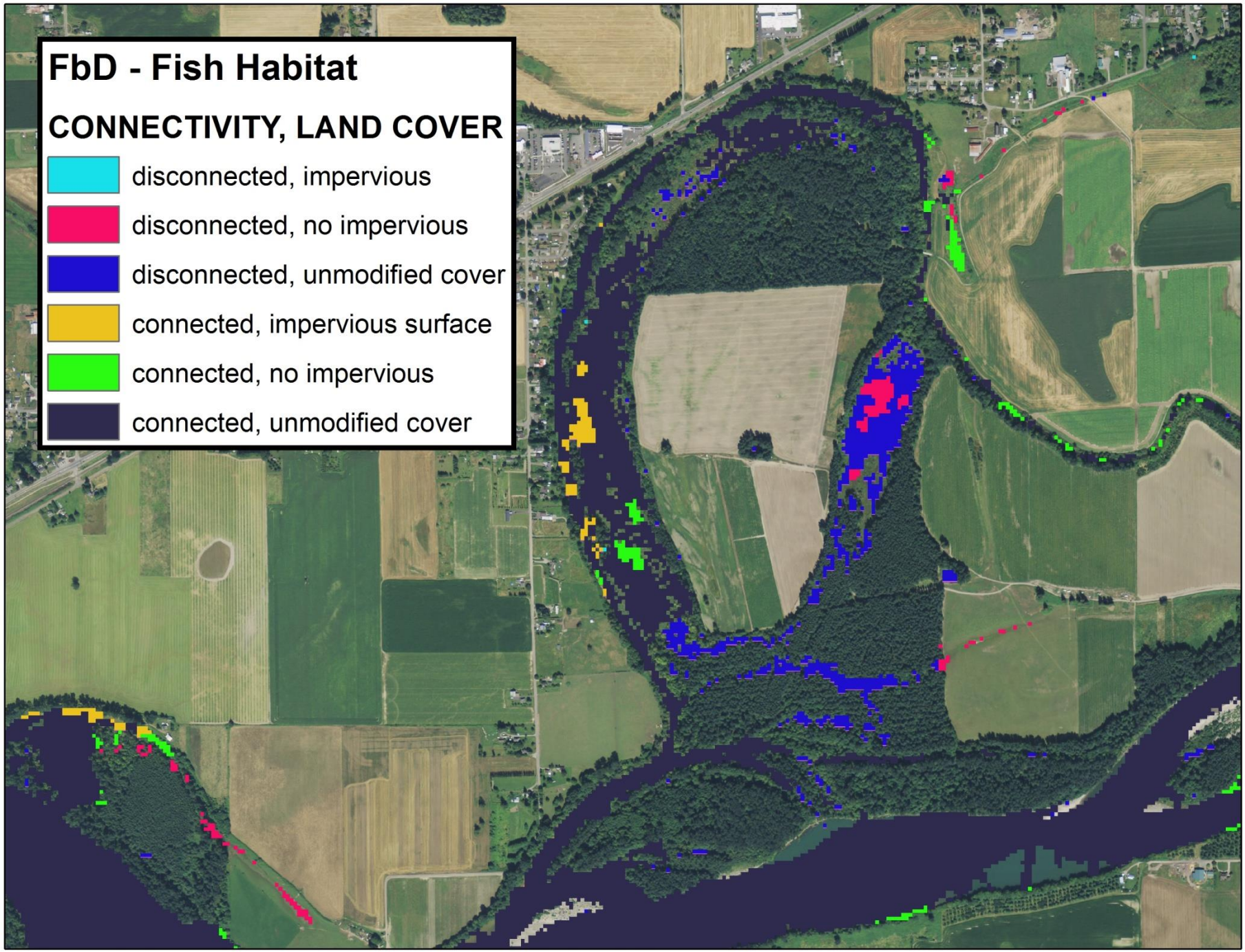
Floodplain Connectivity (C. Konrad, USGS)

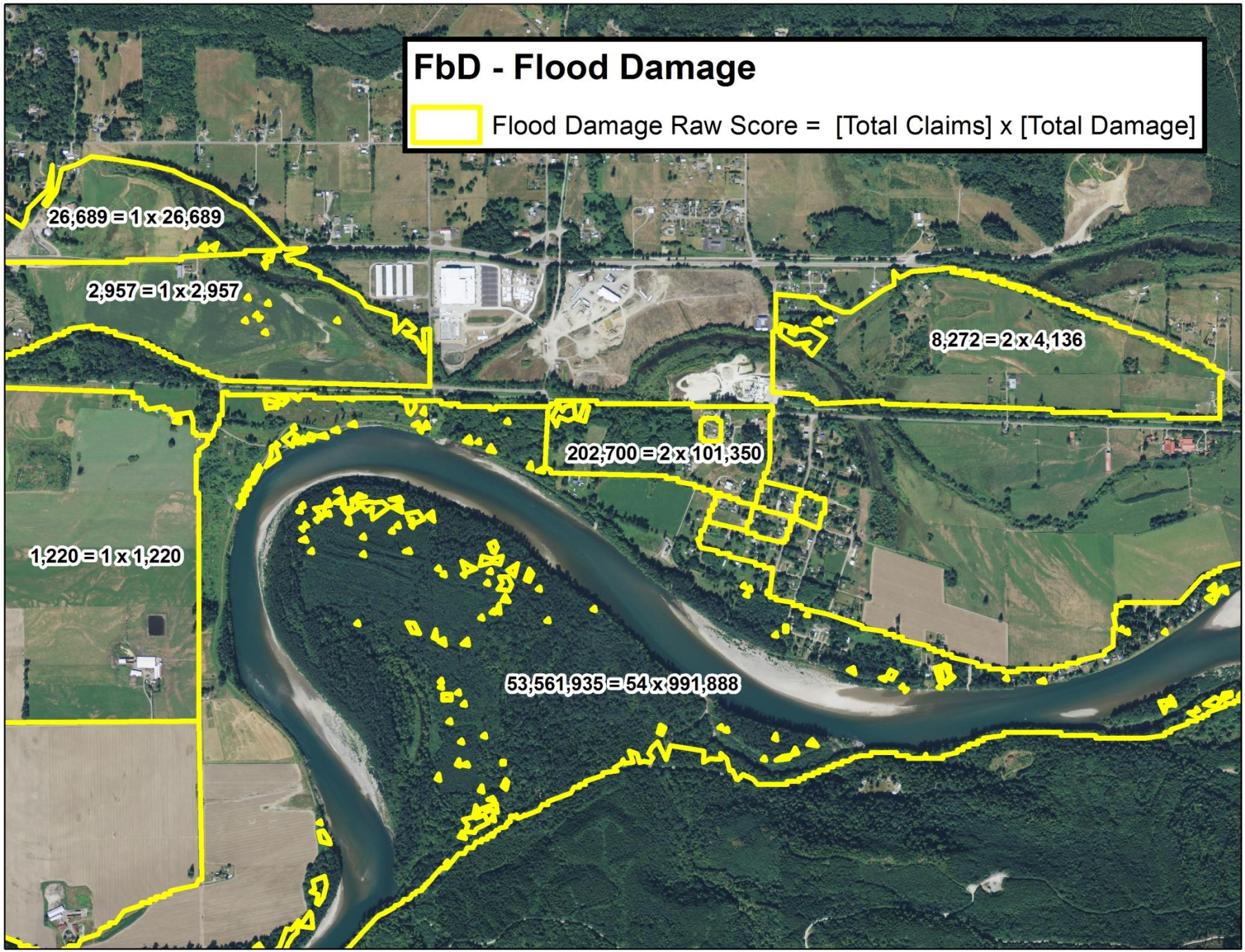


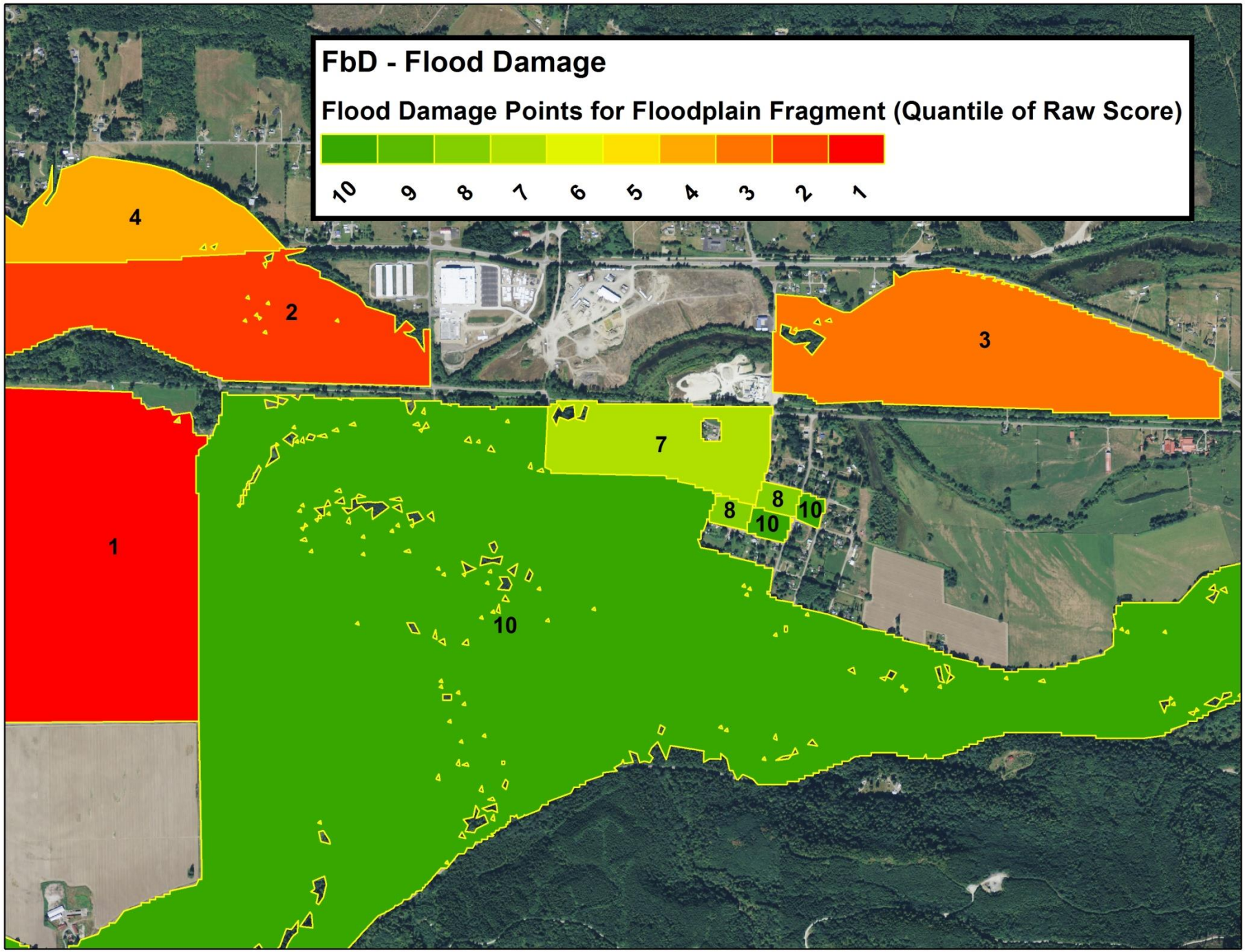

FbD - Fish Habitat
Edge Analysis
not edge
edge, impervious
edge, not forest
edge, forest

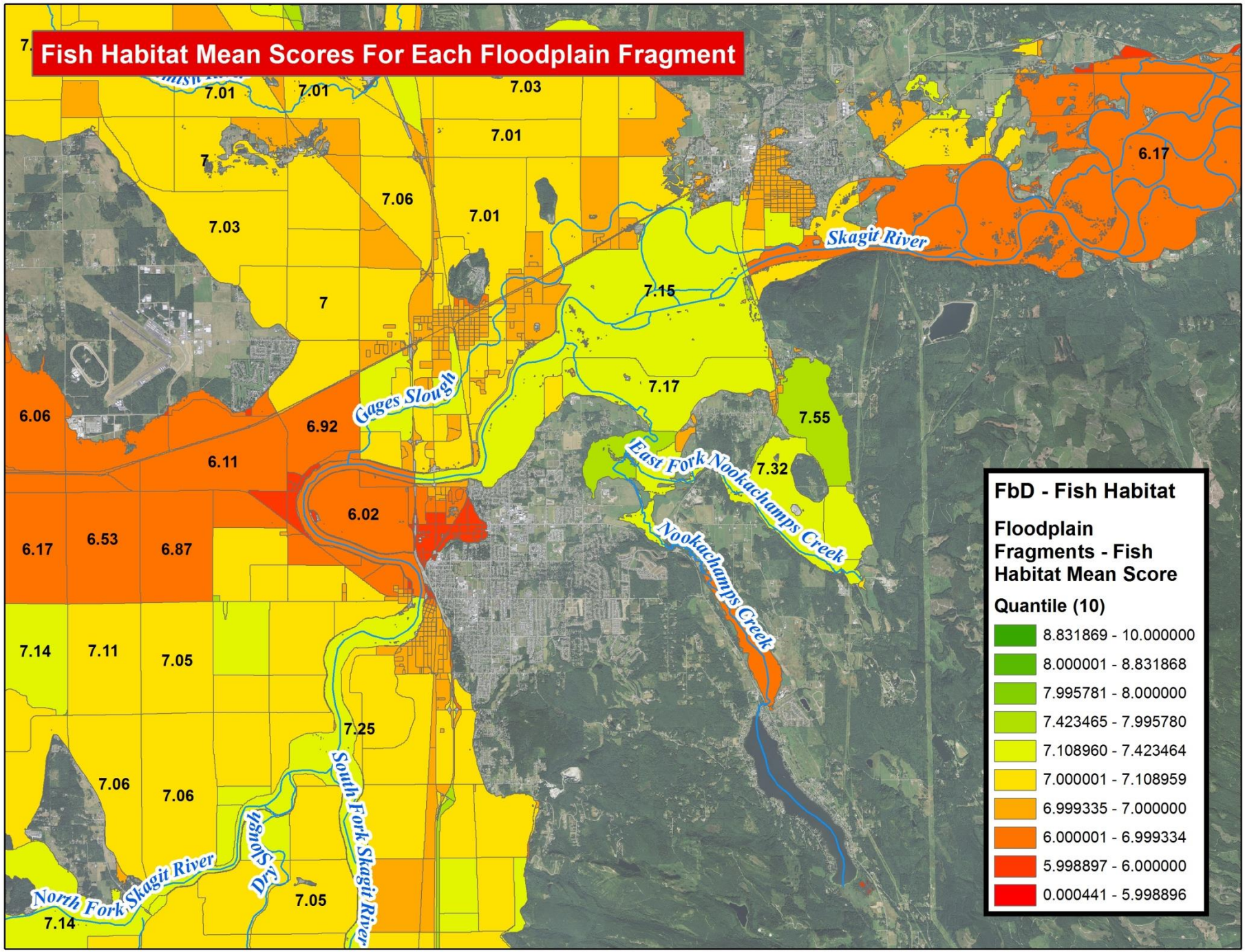

FbD - Fish Habitat
Water Quality (CWA Section 303d)
Temp Impaired
Temp & PH Impaired
Temp & DO Impaired
DO & PH Impaired
DO Impaired
All Impaired

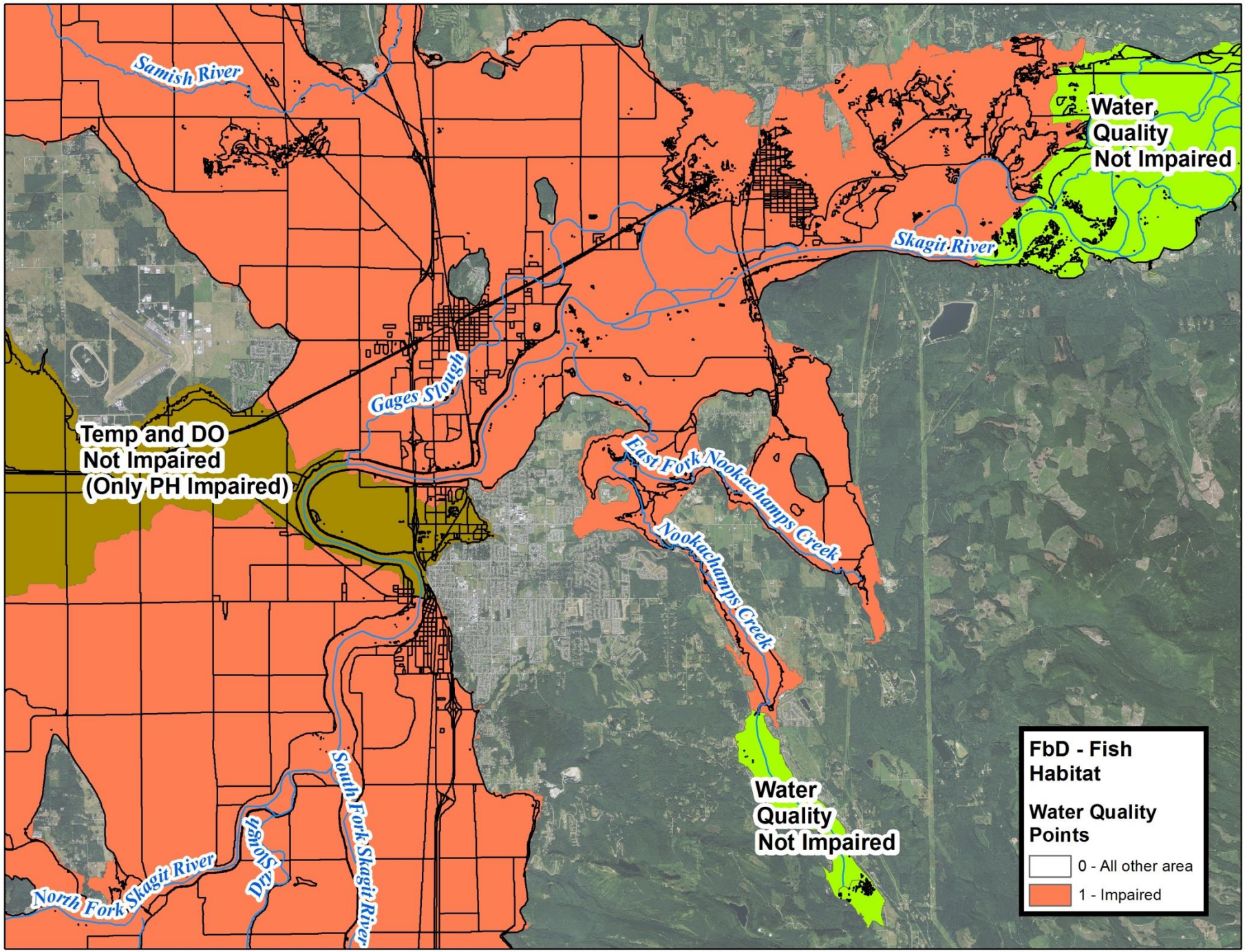

FbD - Fish Habitat
NWI WETLAND TYPES
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond

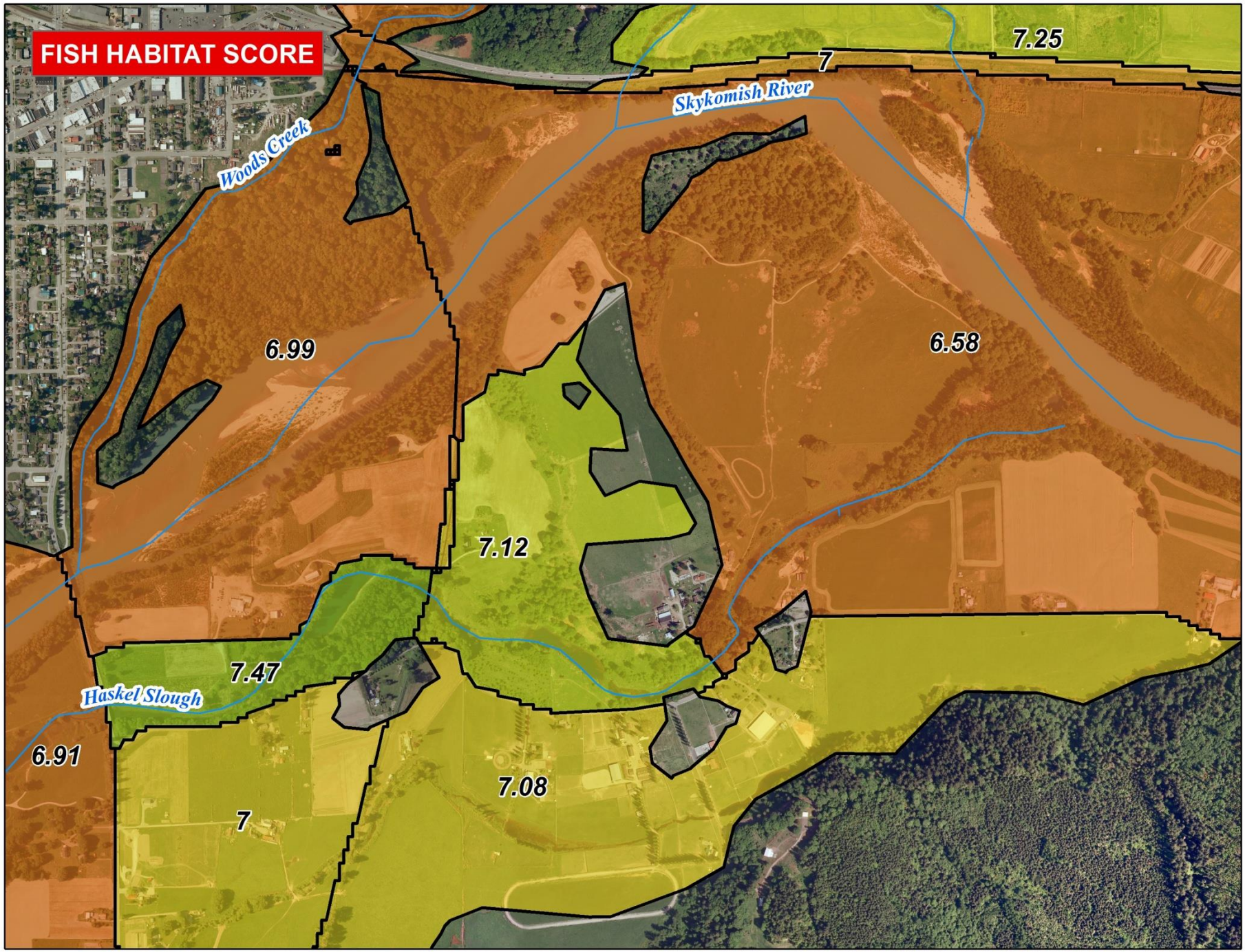

FbD - Fish Habitat
CONNECTIVITY, LAND COVER
disconnected, impervious
disconnected, no impervious
disconnected, unmodified cover
connected, impervious surface
connected, no impervious
connected, unmodified cover

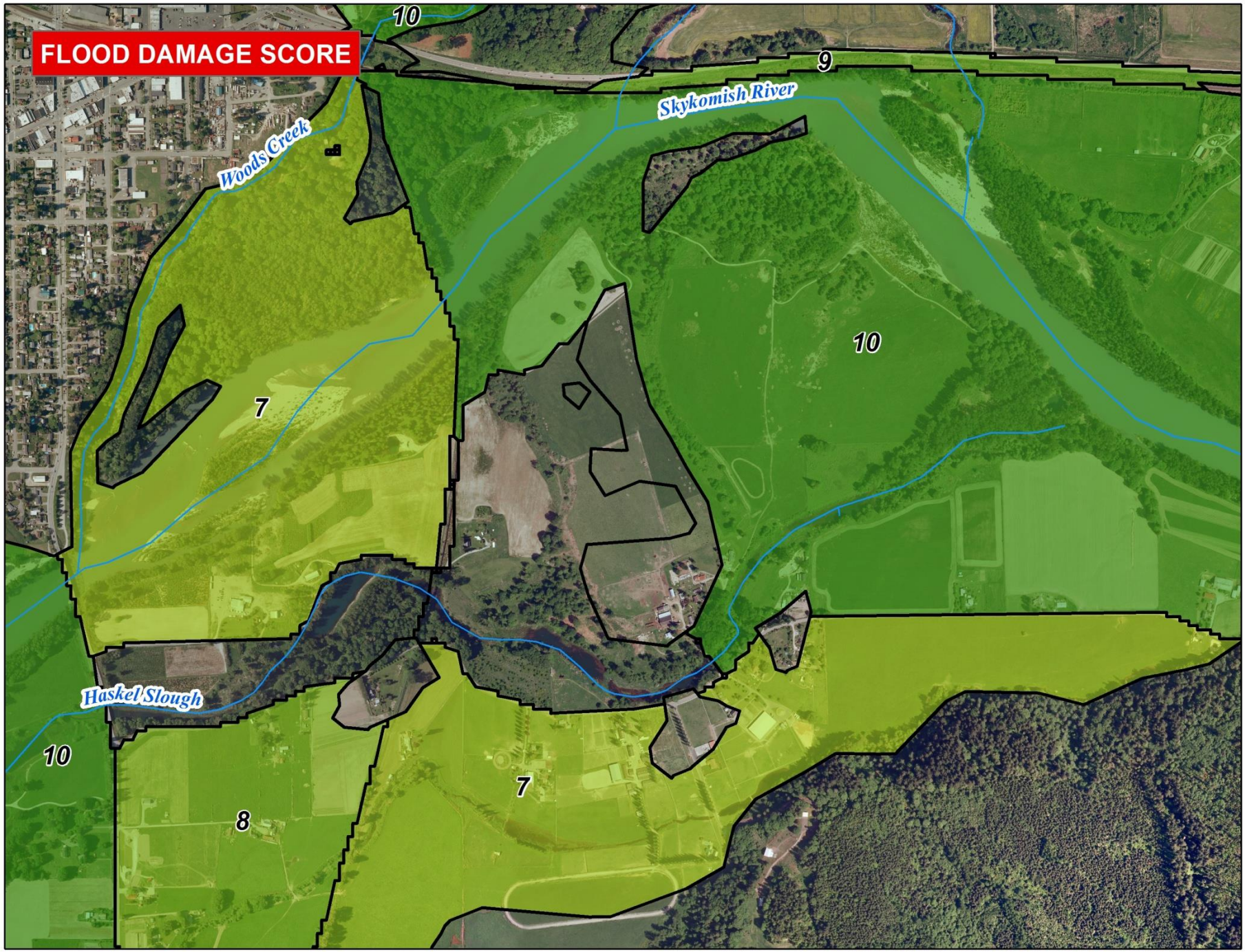

FbD - Flood Damage
Flood Damage Raw Score = [Total Claims] x [Total Damage]
26,689 = 1 x 26,689
2,957 = 1 x 2,957
8,272 = 2 x 4,136
202,700 = 2 x 101,350
1,220 = 1 x 1,220
53,561,935 = 54 x 991,888

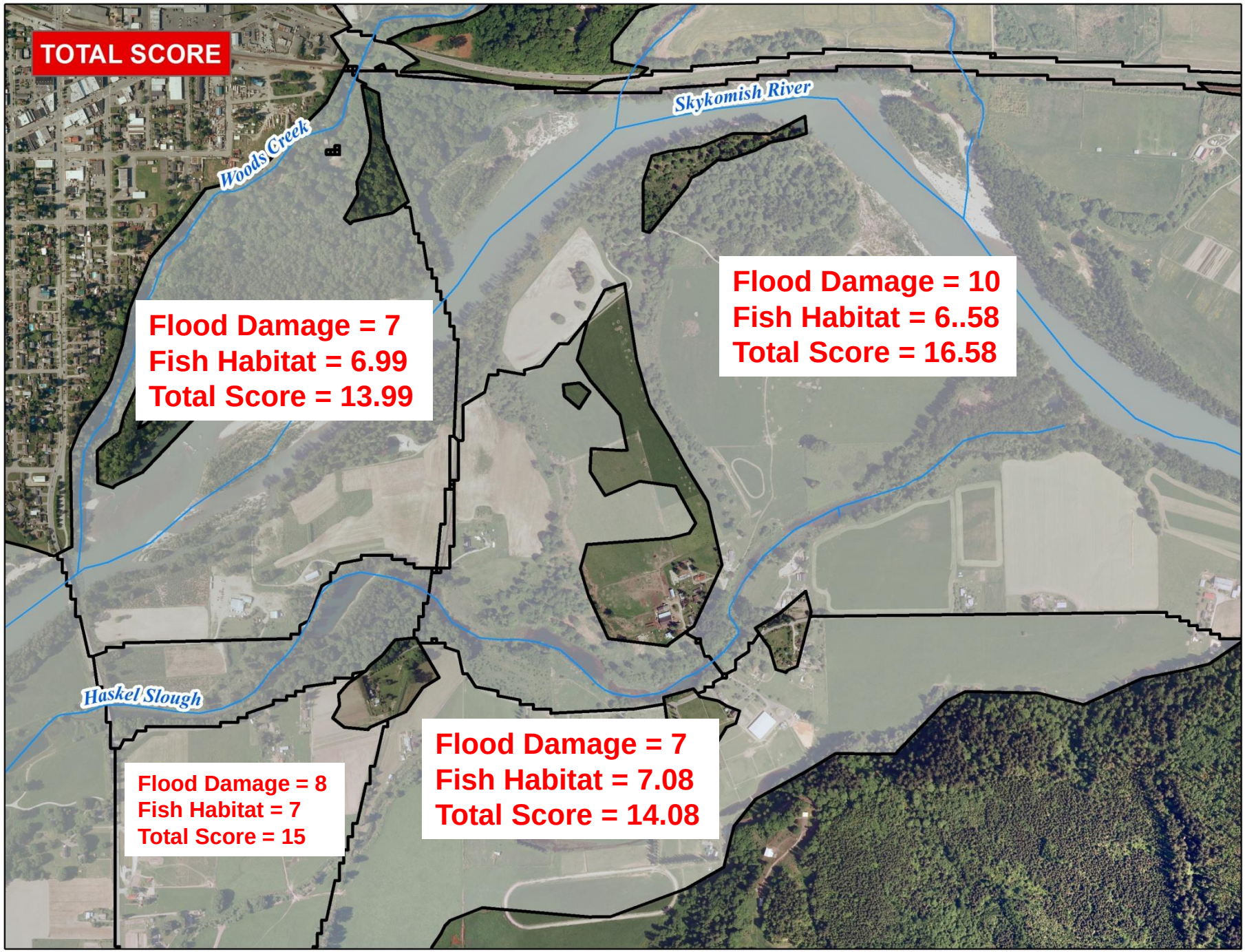

FbD - Flood Damage
Flood Damage Points for Floodplain Fragment (Quantile of Raw Score)
10
9
8
7
6
5
4
3
2
1
4
2
3
7
8
8
10
10
1
10

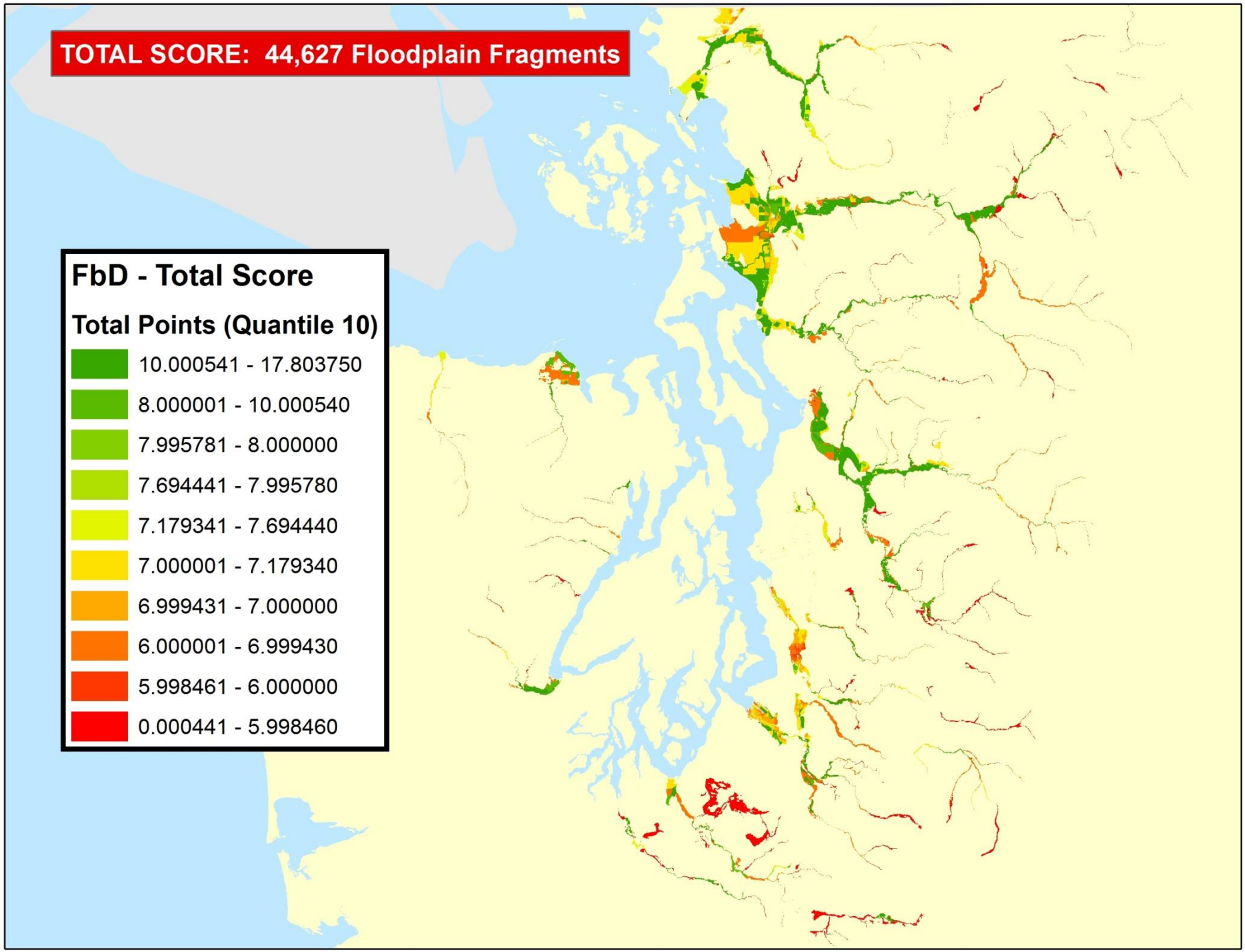

Fish Habitat Mean Scores For Each Floodplain Fragment
7.01
7.01
7.03
7.01
7
6.17
7.06
7.01
7.03
Skagit River
7.15
7
Gages Slough
7.17
6.06
6.92
7.55
6.11
East Fork Nookachamps Creek
7.32
6.02
Nookachamps Creek
6.17
6.53
6.87
7.14
7.11
7.05
7.25
South Fork Skagit River
7.06
7.06
Dry Slough
North Fork Skagit River
7.05
7.14
FbD - Fish Habitat
Floodplain Fragments - Fish Habitat Mean Score
Quantile (10)
8.831869 - 10.000000
8.000001 - 8.831868
7.995781 - 8.000000
7.423465 - 7.995780
7.108960 - 7.423464
7.000001 - 7.108959
6.999335 - 7.000000
6.000001 - 6.999334
5.998897 - 6.000000
0.000441 - 5.998896


Samish River
Water Quality Not Impaired
Skagit River
Gages Slough
Temp and DO Not Impaired (Only PH Impaired)
East Fork Nookachamps Creek
Nookachamps Creek
South Fork Skagit River
Dry Slough
North Fork Skagit River
Water Quality Not Impaired
FbD - Fish Habitat
Water Quality Points
0 - All other area
1 - Impaired


FISH HABITAT SCORE
7.25
7
Skykomish River
Woods Creek
6.99
6.58
7.12
7.47
Haskel Slough
6.91
7.08
7


FLOOD DAMAGE SCORE
10
9
Skykomish River
Woods Creek
10
7
Haskel Slough
10
8
7


TOTAL SCORE
Skykomish River
Woods Creek
Haskel Slough
Flood Damage = 7
Fish Habitat = 6.99
Total Score = 13.99
Flood Damage = 10
Fish Habitat = 6..58
Total Score = 16.58
Flood Damage = 8
Fish Habitat = 7
Total Score = 15
Flood Damage = 7
Fish Habitat = 7.08
Total Score = 14.08


TOTAL SCORE: 44,627 Floodplain Fragments
FbD - Total Score
Total Points (Quantile 10)
10.000541 - 17.803750
8.000001 - 10.000540
7.995781 - 8.000000
7.694441 - 7.995780
7.179341 - 7.694440
7.000001 - 7.179340
6.999431 - 7.000000
6.000001 - 6.999430
5.998461 - 6.000000
0.000441 - 5.998460

Top Ten Fragments by Total Score

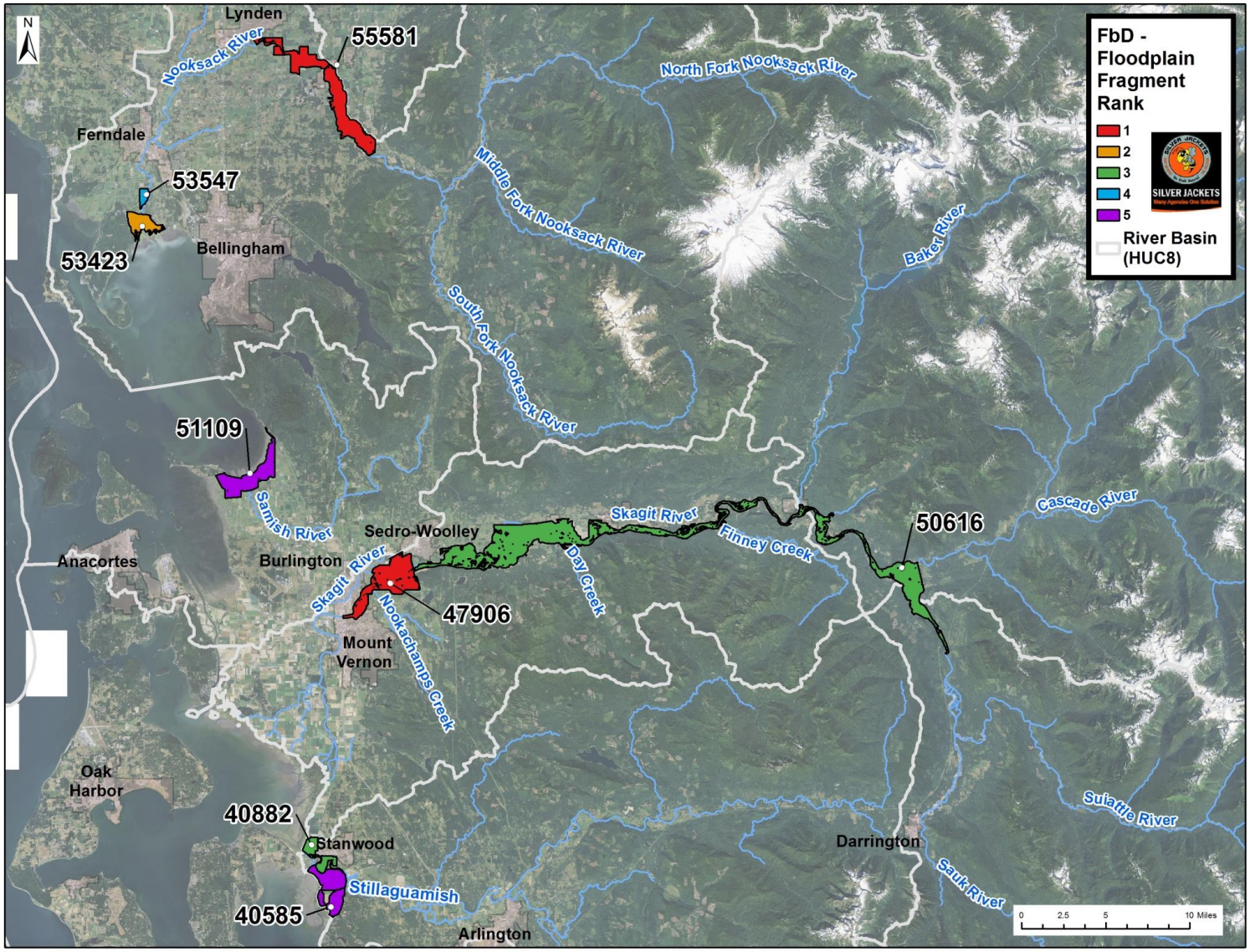
Fragment ID	Flood Damage Score	Fish Habitat Score	Total Score
53423	10	7.80375	17.80375
33374	10	7.60626	17.60626
35391	10	7.17852	17.17852
40882	10	7.16994	17.16994
53547	10	7.15983	17.15983
6203	10	7.14957	17.14957
47906	10	7.14735	17.14735
7548	10	7.13522	17.13522
55581	10	7.11763	17.11763
6500	10	7.07987	17.07987

SAME!

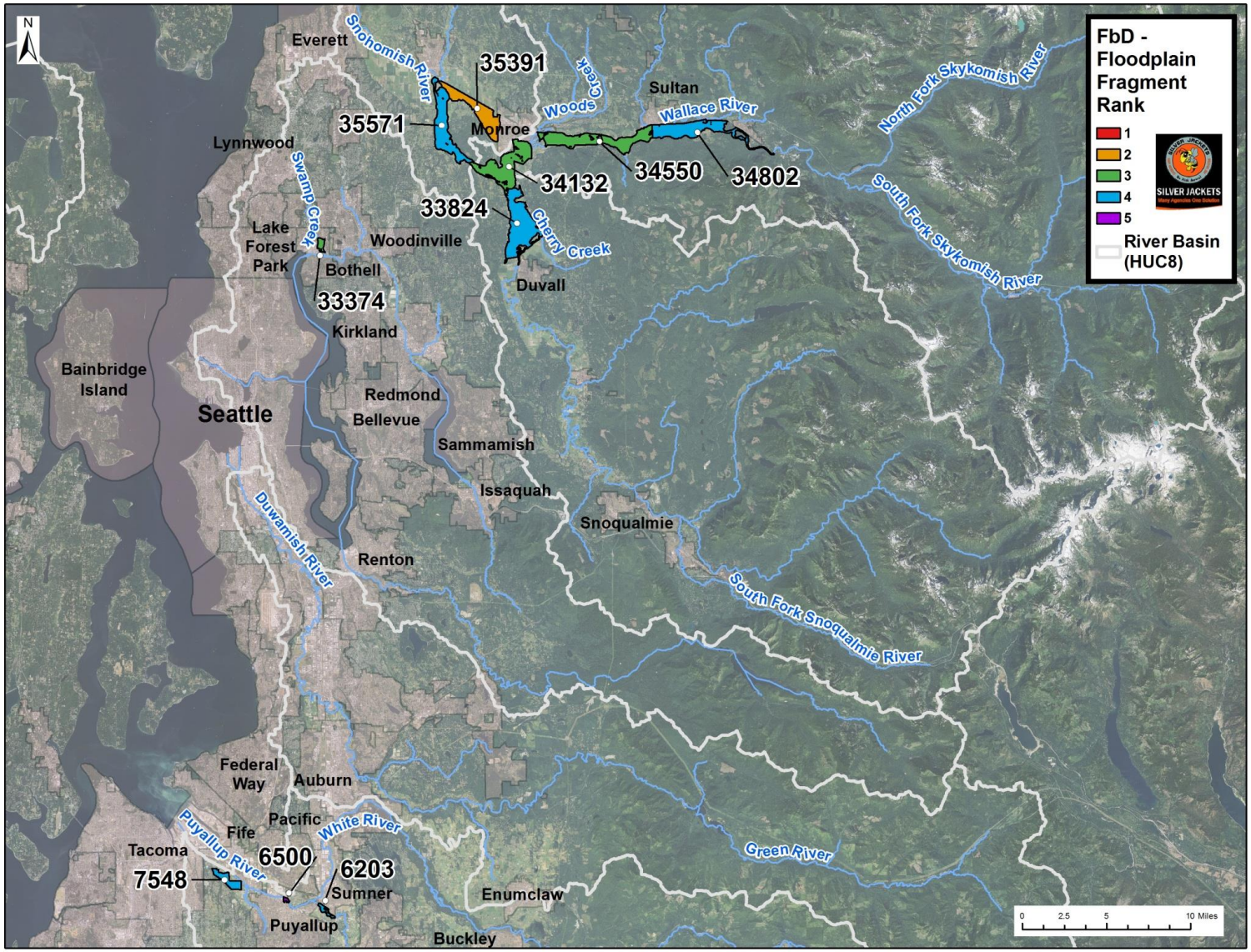
Top Ten Fragments by Acres

Fragment ID	Flood Damage	Fish Habitat	Total Points	ACRES
50616	10	6.16923	16.16923	15,498
55581	10	7.11763	17.11763	5,051
47906	10	7.14735	17.14735	3,802
33824	10	6.12823	16.12823	3,127
34550	10	6.58147	16.58147	2,743
34132	10	6.91077	16.91077	2,716
51109	5	7.04362	12.04362	2,589
34802	10	6.88296	16.88296	2,355
35571	10	6.74452	16.74452	2,314
40585	9	7.05282	16.05282	2,204

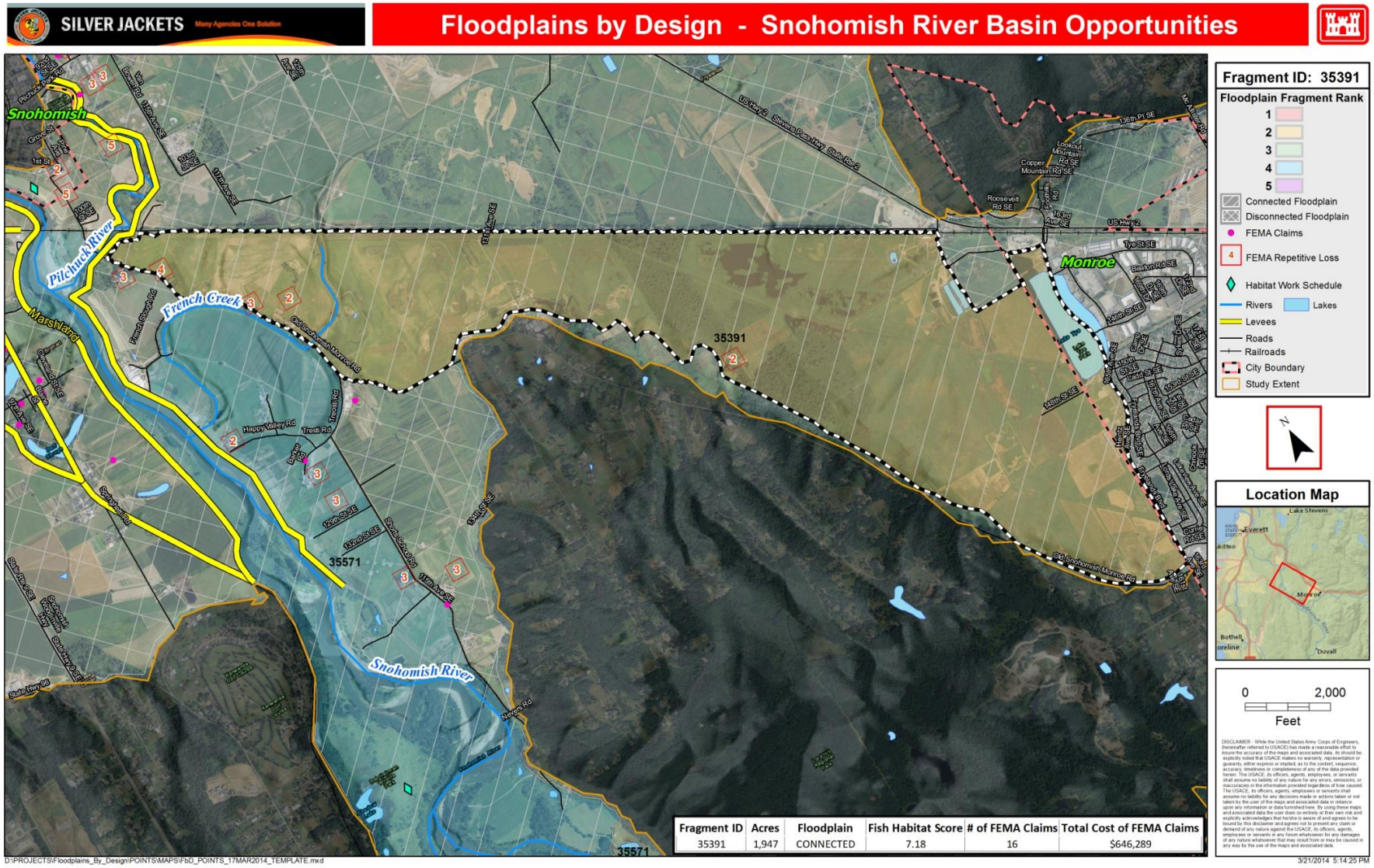
Stillaguamish and North



Snohomish and South



Snohomish Fragment Id 35391



Next Steps

- Produce next 9 segment maps
- Pilot properties cost benefit analysis
  - Repetitive loss versus acquisition
- Conduct FRM meetings in targeted segments
- Fragment/basin overlap with ongoing GI/CAP projects
- Projects suitable for USACE programs
- Prepare segment fact sheets
- Prepare the final report

FY14 NS FRM Pilot Project RFP

- Ground Rules
  - The deadline for submission of proposals has been extended to 25 April
  - $500K for the flood risk management and just over $1M for nonstructural projects is available
  - Coordinate all proposals with the appropriate District FPMS PM first. All proposals will be forwarded through the District FPMS PM to MSC FPMS PM
  - Funding available through SJ

Questions?