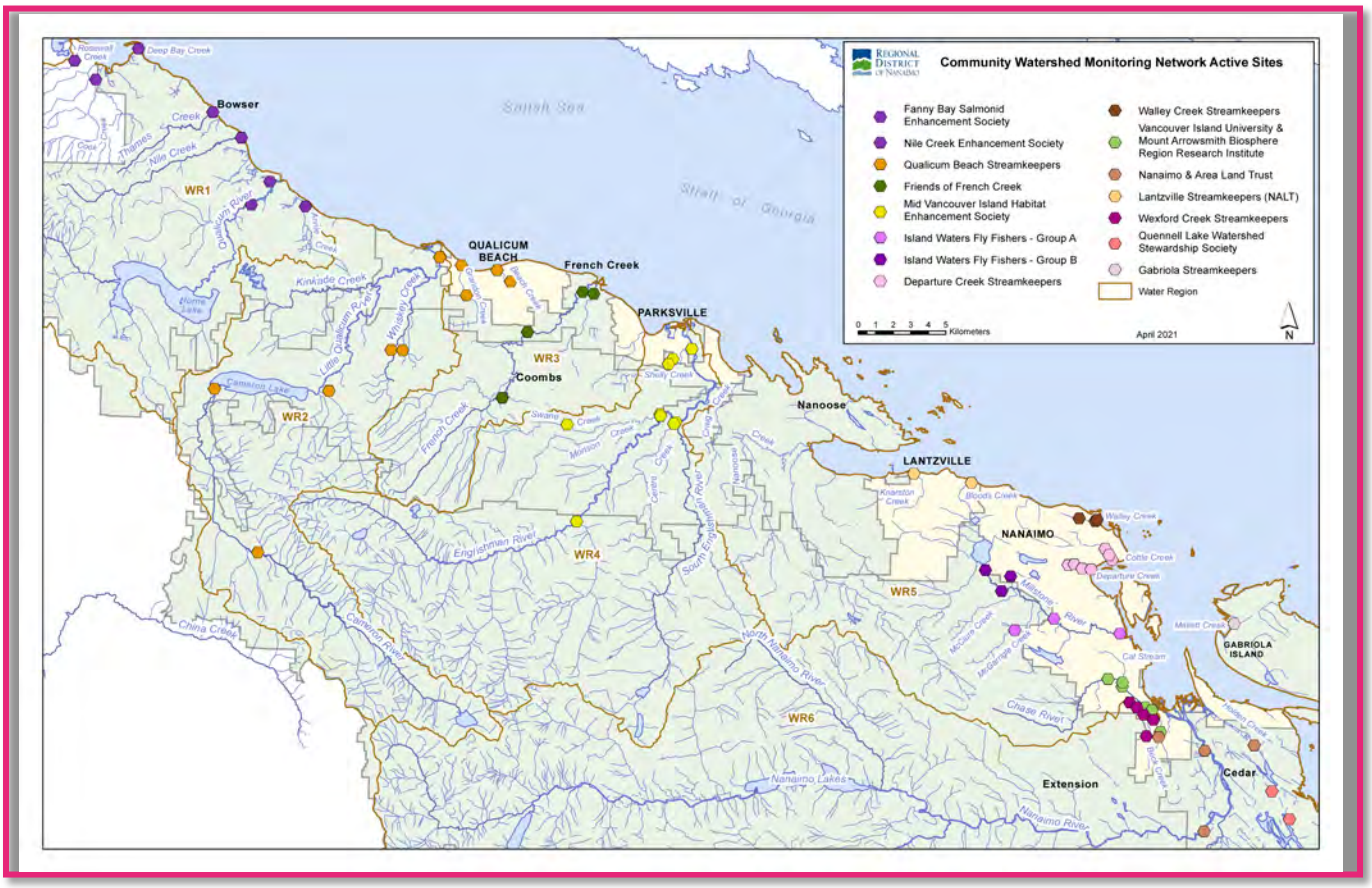
Community Watershed Monitoring Network 2020 Results by Water Region

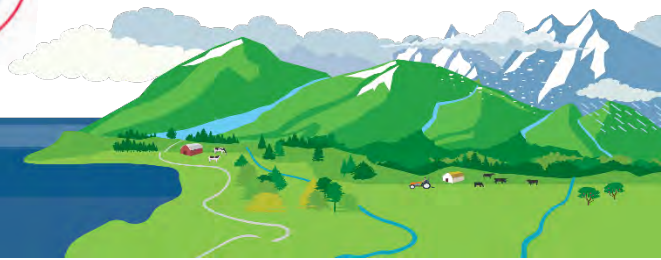


Included in your Water Region Package:

1. CWMN Sample Sites in Water Region (WR) 5-1
2. How to Interpret a Box Plot and Summer / Fall Exceedance Maps
3. Box Plot Comparison 2020 Data to Previous Years: *Graphs displayed per parameter (Temperature, Dissolved Oxygen, Turbidity, Conductivity) and per sample period (summer and fall)*
4. 2011-2020 Water Quality Trend Analysis Map
5. 2011-2020 Summer Exceedance Map
6. 2011-2020 Fall Exceedance Map
7. LNS Site Map
8. DCS Site Map
9. WCS Site Map

Water Region 5-1
sampled by:

Nanoose Streamkeepers Society and Lantzville Streamkeepers (LNS),
Departure Creek Streamkeepers (DCS)
&
Walley Creek Streamkeepers (WCS)



Created for the RDN's Community Watershed Monitoring Network for the May 2021 Results Session. Questions? Call 250-390-6560

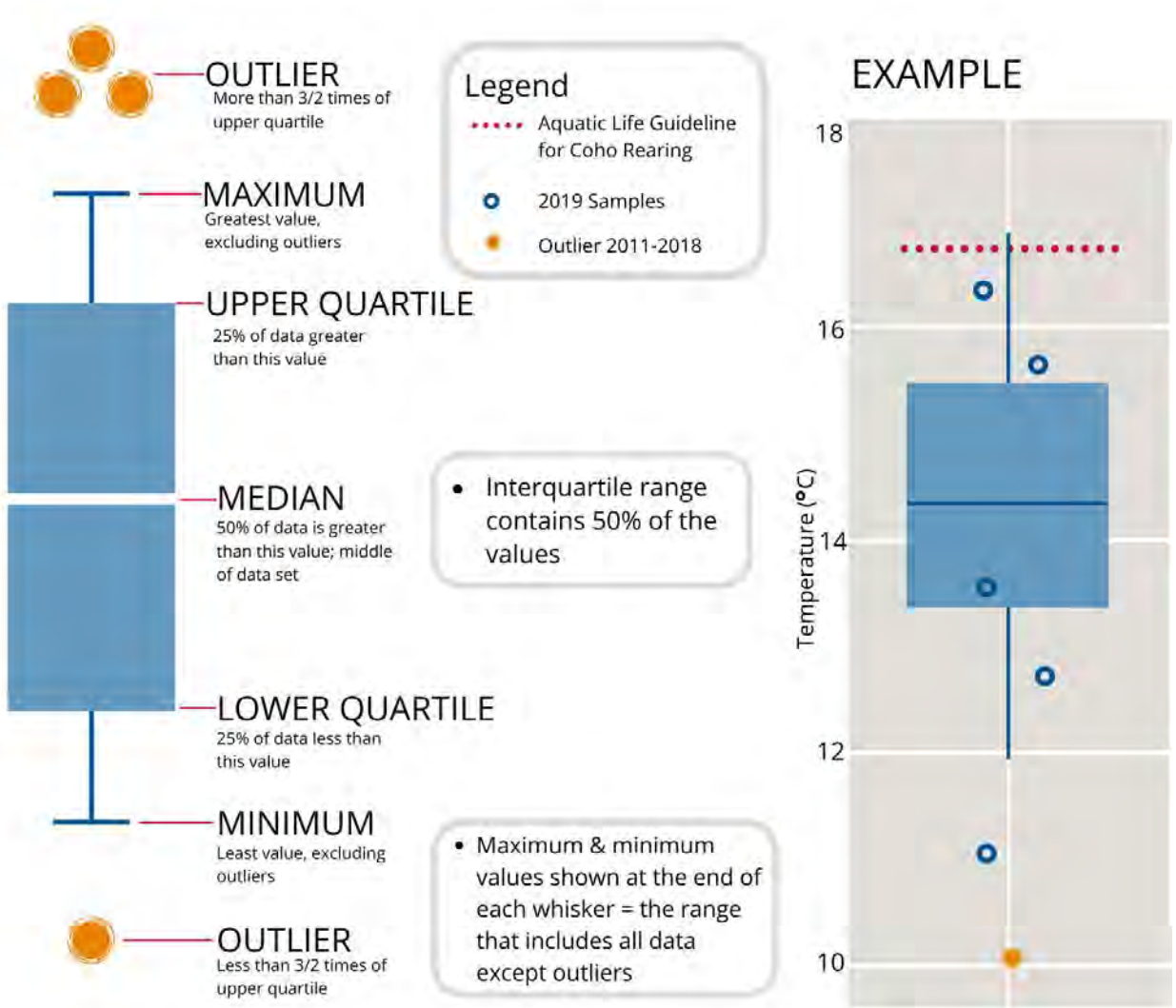
CWMN Sample Sites in WR 5-1:

The table below shows the groups and sites monitored, as well as the number of years and which years a site was sampled. The number of years is important to keep in mind when interpreting the box plots as the plot for each site may contain a slightly different temporal range.

Group	EMS ID	Geographic Description	Years Sampled*	Years Monitored
LNS	E294010	Bloods Creek just u/s Dickenson Rd	3.5	fall 2017 - present
LNS	E294013	Knarston Ck just u/s Lantzville Rd	3.5	fall 2017 - present
DCS	E290469	Departure Ck @ Neyland Rd (Stn1)	9	2012 - present
DCS	E290470	Josephs Ck (Dept Ck trib) off Newton (Stn 2)	9	2012 - present
DCS	E290471	Departure Ck in Woodstream Park (Stn 3)	9	2012 - present
DCS	E290472	Departure Ck @ outlet (Stn 4)	9	2012 - present
DCS	E290473	Cottle Creek @ Nottingham	9	2012 - present
DCS	E309186	Cottle Creek d/s of Hammond Bay Road	4	2017 - present
DCS	E290475	Cottle Creek @ Stephenson Pt Rd	9	2012 - present
WCS	E306256	Walley Ck d/s Hammond Bay	5	2016 - present
WCS	E306257	Walley Ck @ Morningside Dr	5	2016 - present
WCS	E306434	Walley Creek 20m u/s beach	5	2016 - present

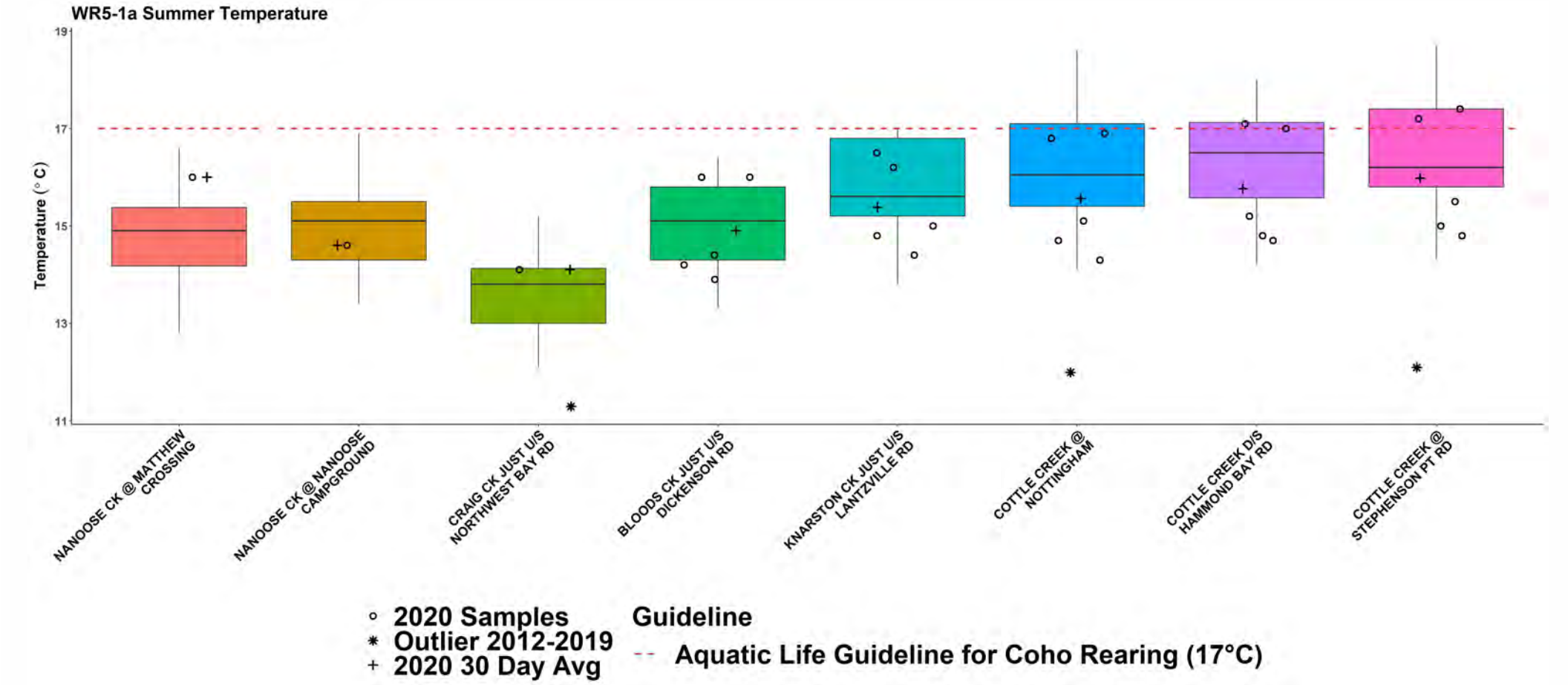
**The number of years sampled up to and including 2020.*

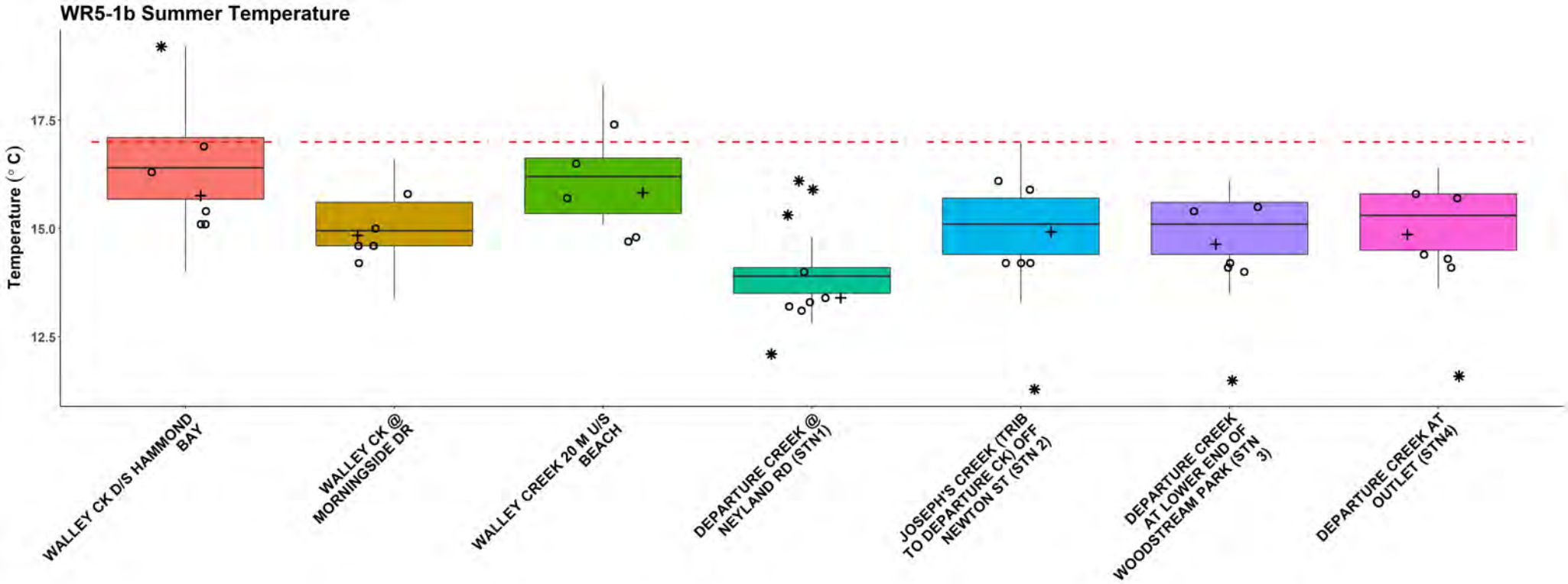
How to Interpret a Box Plot:



How to Interpret Summer and Fall Exceedance Maps:

The summer and fall exceedance frequency maps included in this package express the number of sample periods (summer low-flow / fall flush) with exceedances for each site. There are four frequency categories for the number of sample periods with exceedances: no exceedance recorded (0), low (1 – 2), moderate (3 – 4), and high (5 or more). The exceedance categories are for the three parameters with aquatic water quality guidelines and objectives based on the following thresholds: temperature ≥17°C, dissolved oxygen ≤5mg/L, summer turbidity ≥2NTU, and fall turbidity ≥5NTU.


WR5-1a Summer Temperature
Temperature (° C)
19
17
15
13
11
NANOOSE CK @ MATTHEW CROSSING
NANOOSE CK @ NANOOSE CAMPGROUND
CRAIG CK JUST U/S NORTHWEST BAY RD
BLOODS CK JUST U/S DICKENSON RD
KNARSTON CK JUST U/S LANTZVILLE RD
COTTLE CREEK @ NOTTINGHAM
COTTLE CREEK D/S HAMMOND BAY RD
COTTLE CREEK @ STEPHENSON PT RD
° 2020 Samples
* Outlier 2012-2019
+ 2020 30 Day Avg
Guideline
-- Aquatic Life Guideline for Coho Rearing (17°C)

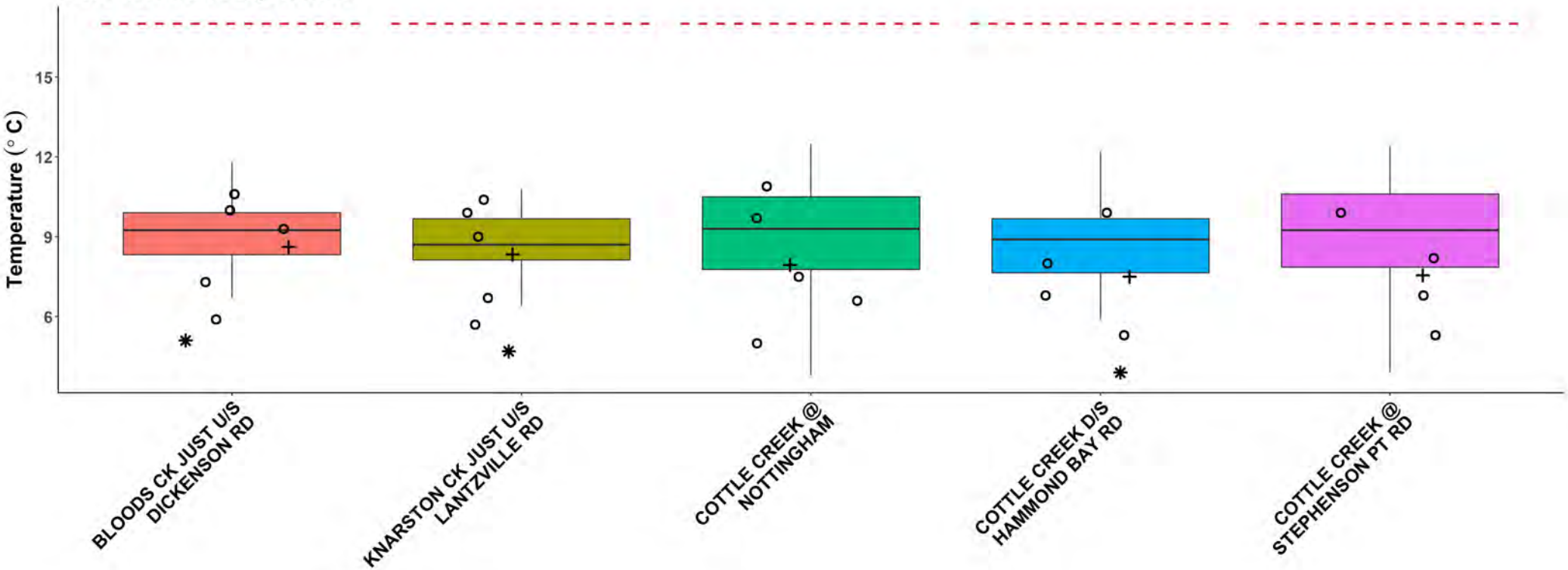


○ 2020 Samples
✱ Outlier 2012-2019
\+ 2020 30 Day Avg

Guideline

-- Aquatic Life Guideline for Coho Rearing (17°C)

WR5-1a Fall Temperature

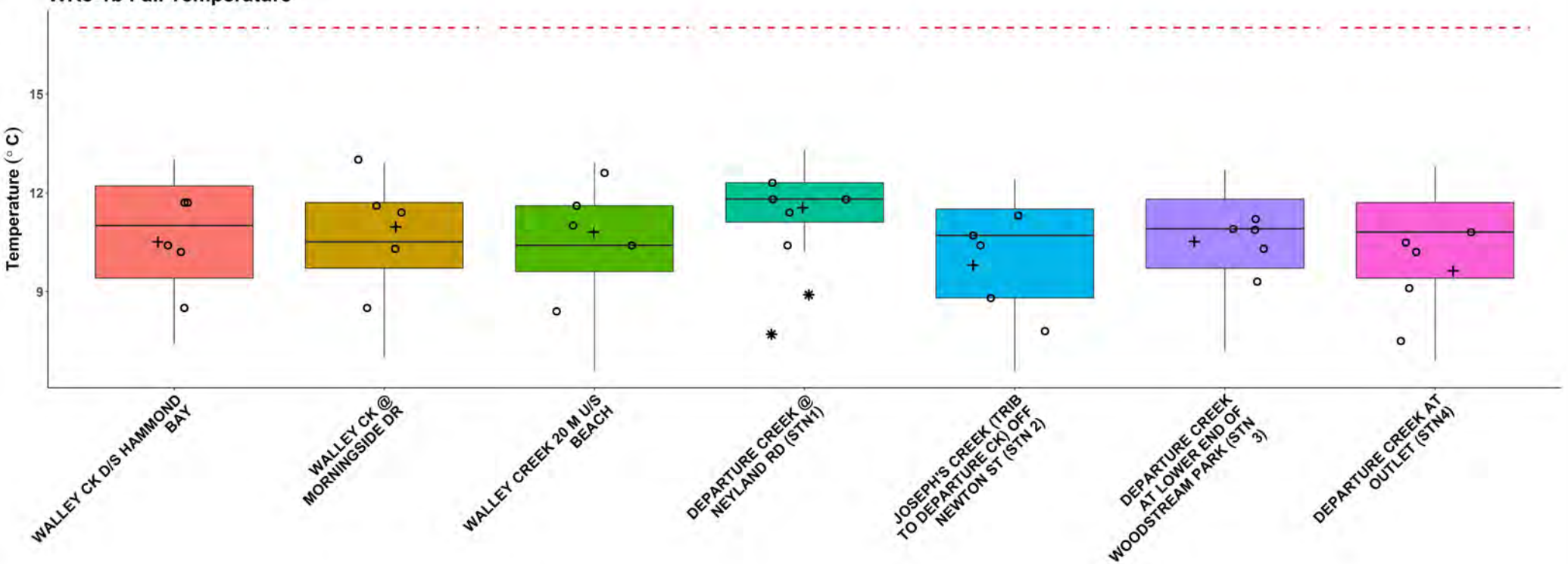


- 2020 Samples
- Outlier 2012-2019
- \+ 2020 30 Day Avg

Guideline

- - Aquatic Life Guideline for Coho Rearing (17°C)

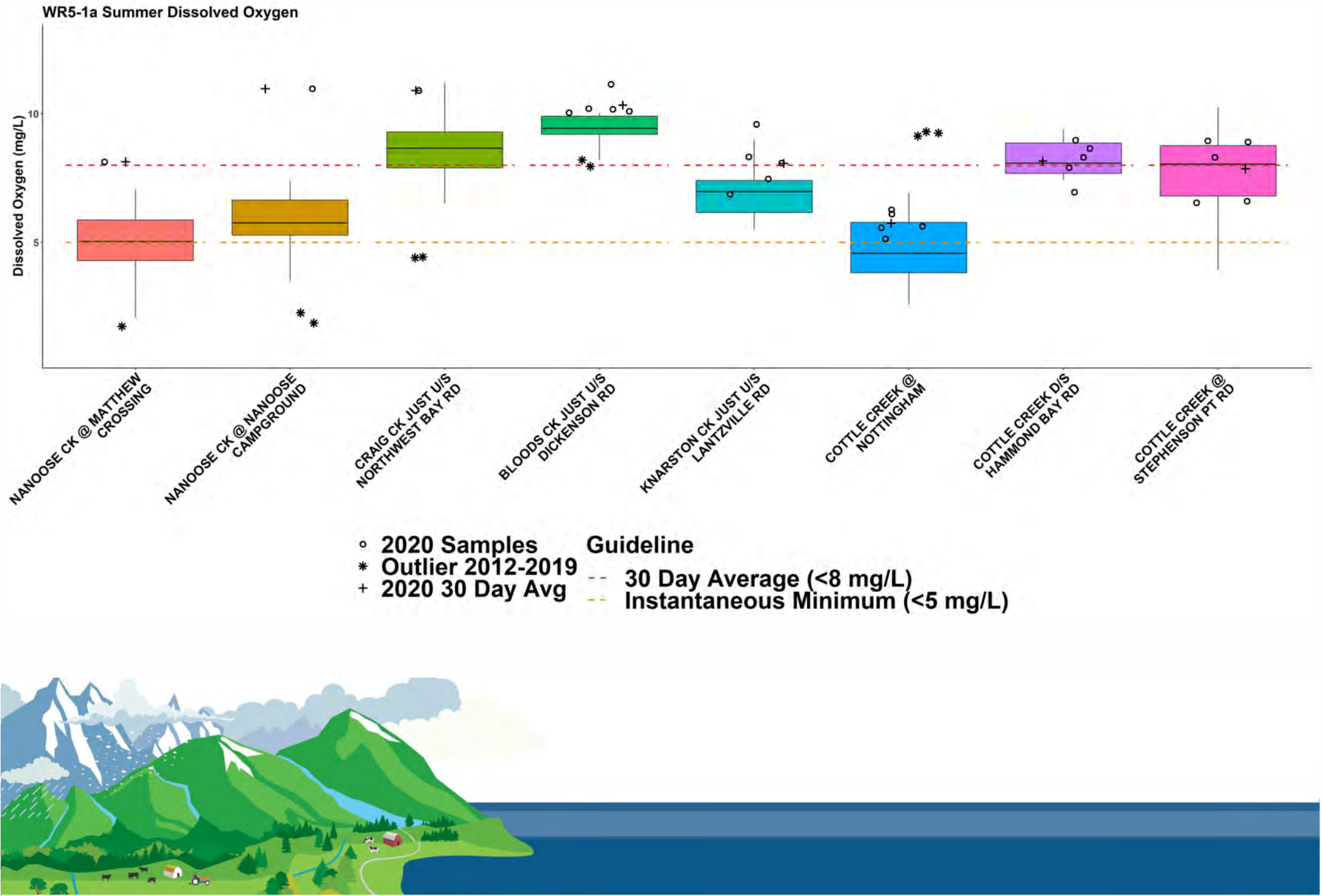
WR5-1b Fall Temperature

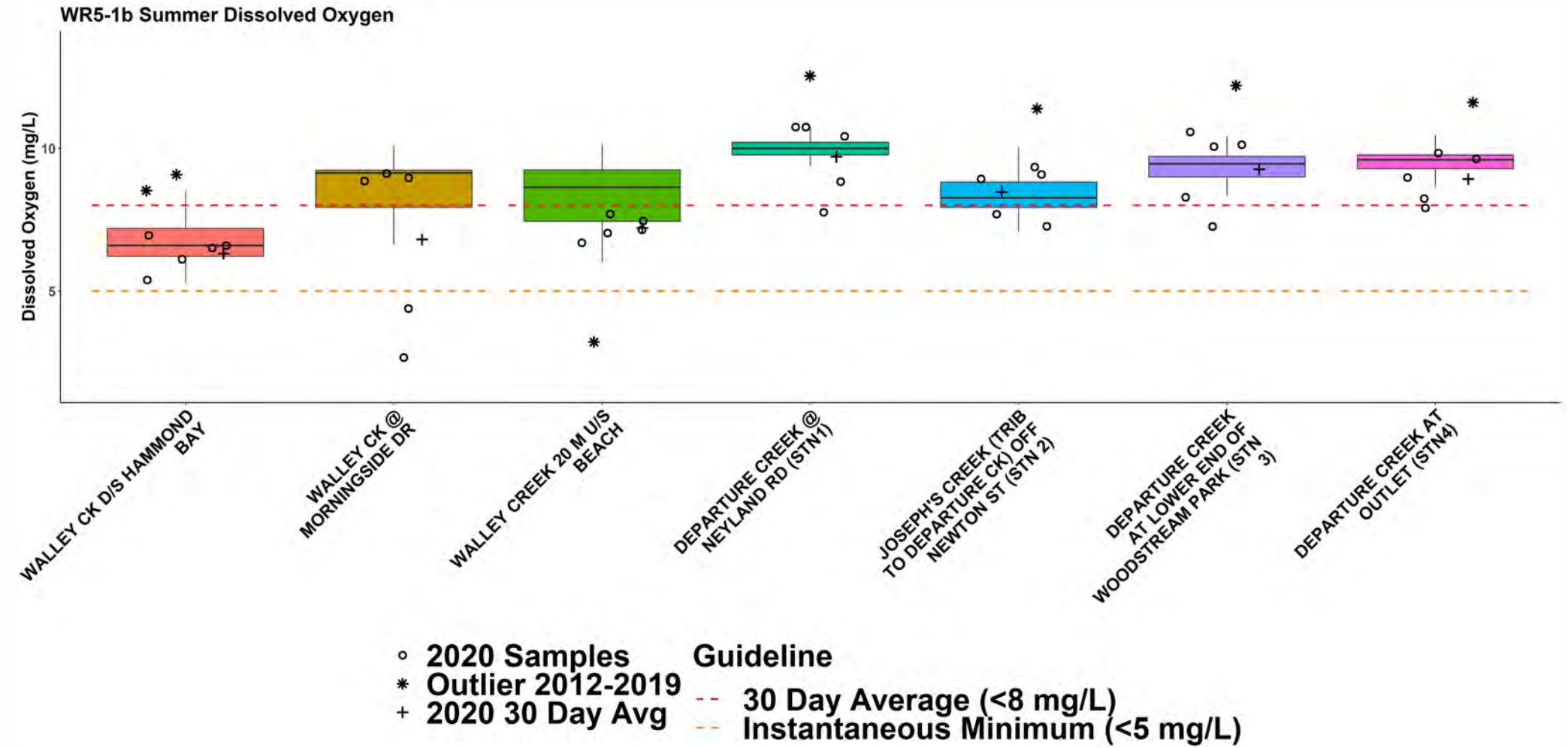


- ° 2020 Samples
- * Outlier 2012-2019
- \+ 2020 30 Day Avg

Guideline

-- Aquatic Life Guideline for Coho Rearing (17°C)

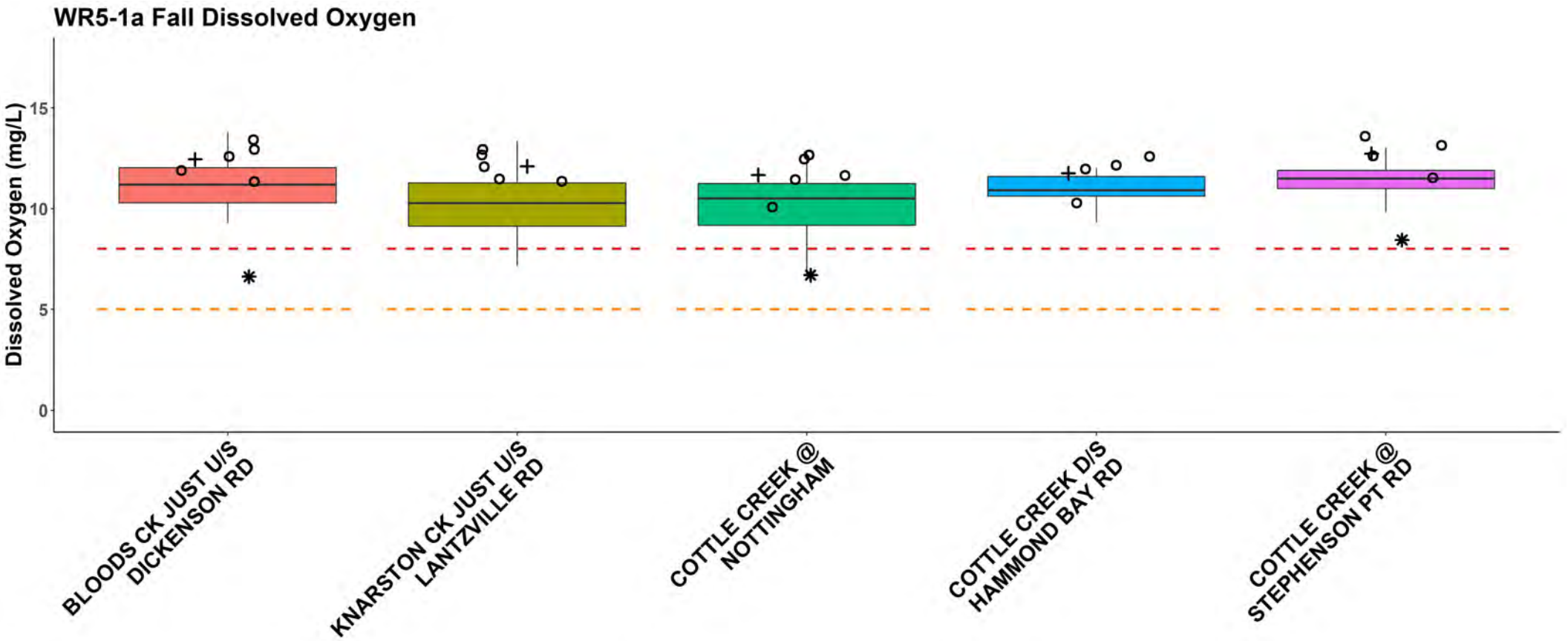

WR5-1a Summer Dissolved Oxygen
Dissolved Oxygen (mg/L)
10
5
NANOOSE CK @ MATTHEW CROSSING
NANOOSE CK @ NANOOSE CAMPGROUND
CRAIG CK JUST U/S NORTHWEST BAY RD
BLOODS CK JUST U/S DICKENSON RD
KNARSTON CK JUST U/S LANTZVILLE RD
COTTLE CREEK @ NOTTINGHAM
COTTLE CREEK D/S HAMMOND BAY RD
COTTLE CREEK @ STEPHENSON PT RD
2020 Samples
Outlier 2012-2019
2020 30 Day Avg
Guideline
30 Day Average (<8 mg/L)
Instantaneous Minimum (<5 mg/L)

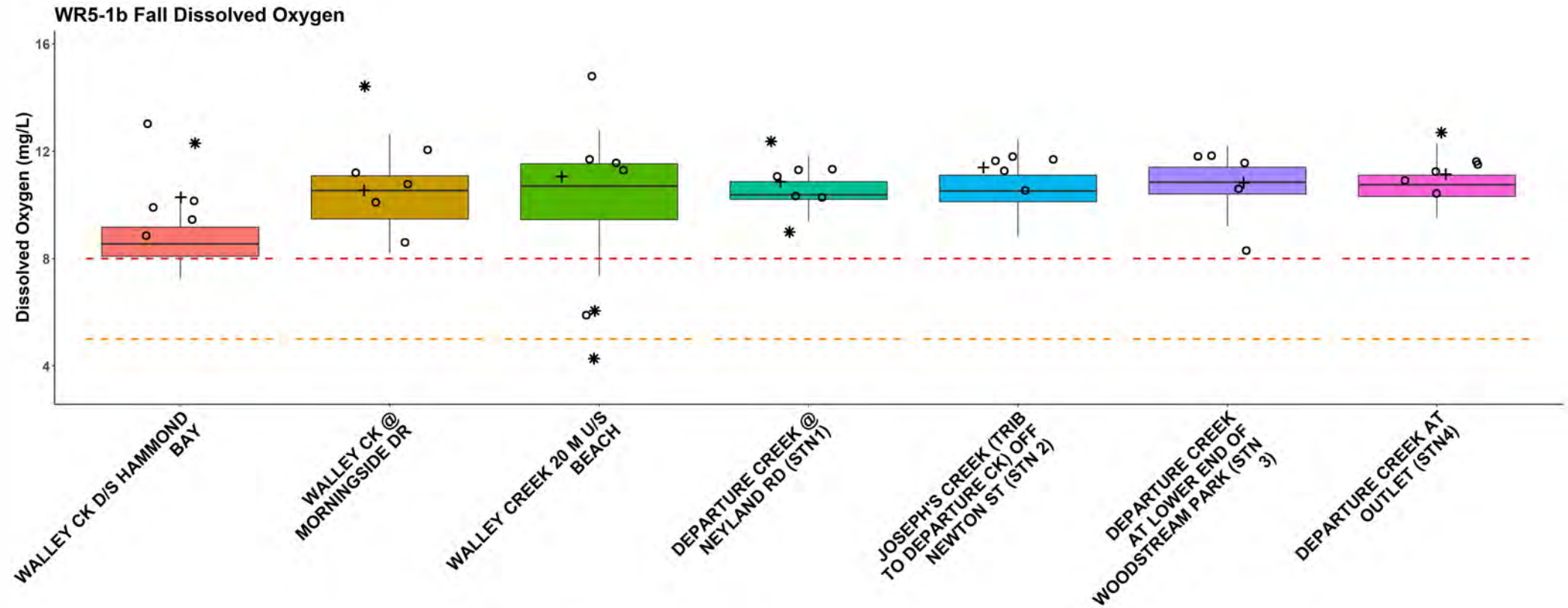


- 2020 Samples
- Outlier 2012-2019
- \+ 2020 30 Day Avg

Guideline

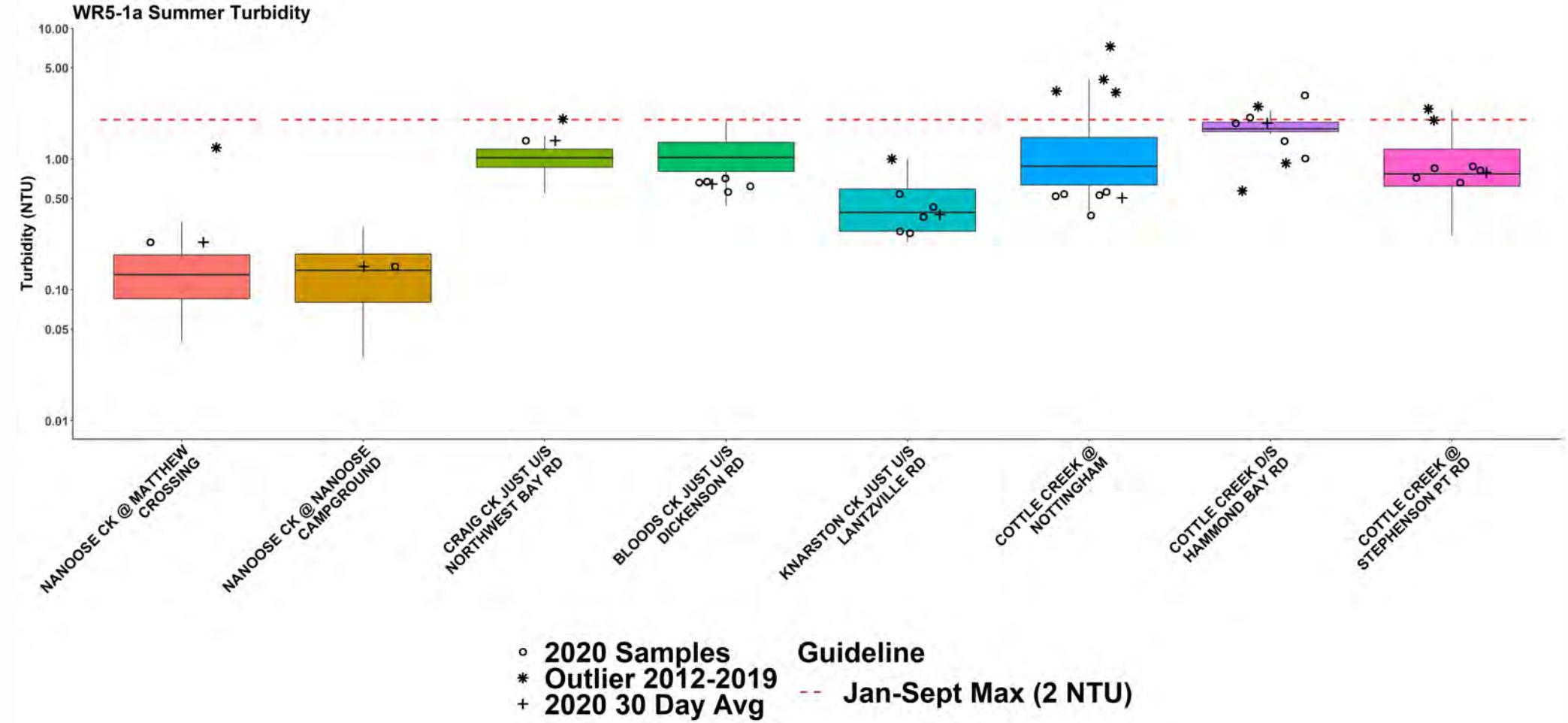
- 30 Day Average (<8 mg/L)
- Instantaneous Minimum (<5 mg/L)

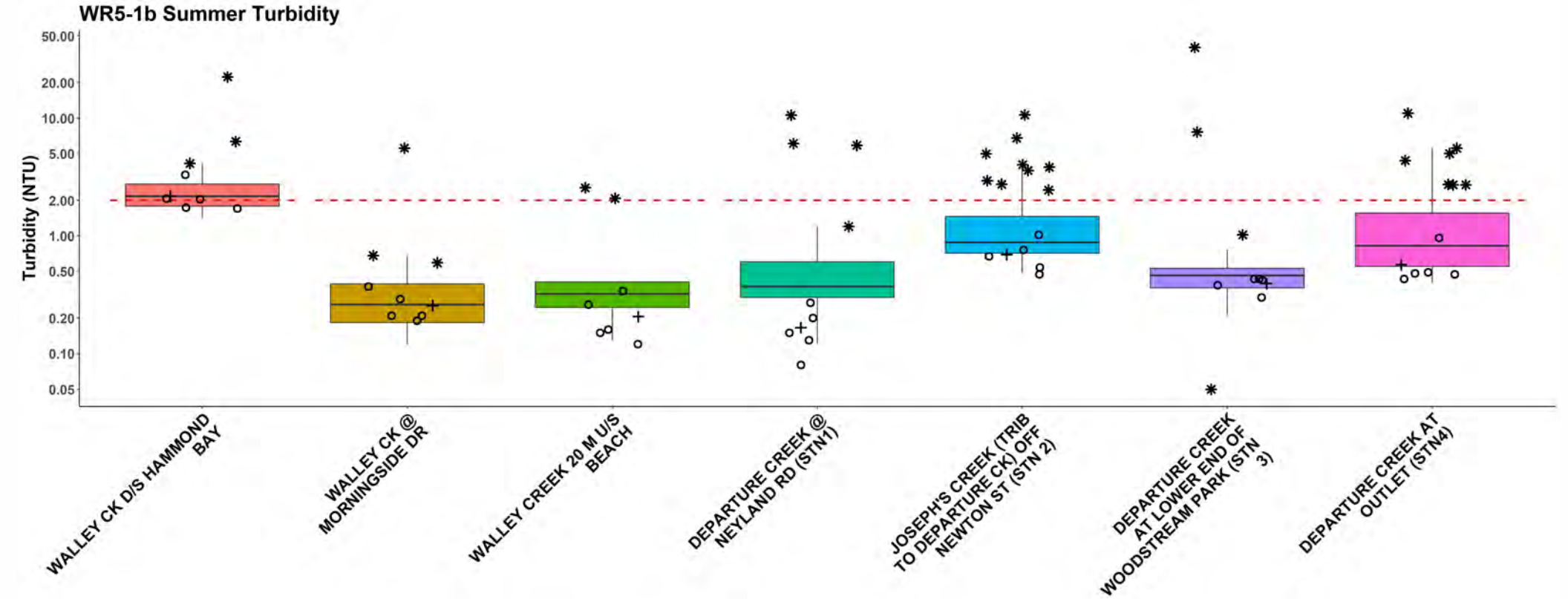

WR5-1a Fall Dissolved Oxygen
Dissolved Oxygen (mg/L)
15
10
5
0
BLOODS CK JUST U/S DICKENSON RD
KNARSTON CK JUST U/S LANTZVILLE RD
COTTLE CREEK @ NOTTINGHAM
COTTLE CREEK D/S HAMMOND BAY RD
COTTLE CREEK @ STEPHENSON PT RD
2020 Samples
Outlier 2012-2019
2020 30 Day Avg
Guideline
30 Day Average (<8 mg/L)
Instantaneous Minimum (<5 mg/L)



2020 Samples
Outlier 2012-2019
2020 30 Day Avg

Guideline
30 Day Average (<8 mg/L)
Instantaneous Minimum (<5 mg/L)


WR5-1a Summer Turbidity
Turbidity (NTU)
10.00
5.00
1.00
0.50
0.10
0.05
0.01
NANOOSE CK @ MATTHEW CROSSING
NANOOSE CK @ NANOOSE CAMPGROUND
CRAIG CK JUST U/S NORTHWEST BAY RD
BLOODS CK JUST U/S DICKENSON RD
KNARSTON CK JUST U/S LANTZVILLE RD
COTTLE CREEK @ NOTTINGHAM
COTTLE CREEK D/S HAMMOND BAY RD
COTTLE CREEK @ STEPHENSON PT RD
2020 Samples
Outlier 2012-2019
2020 30 Day Avg
Guideline
Jan-Sept Max (2 NTU)

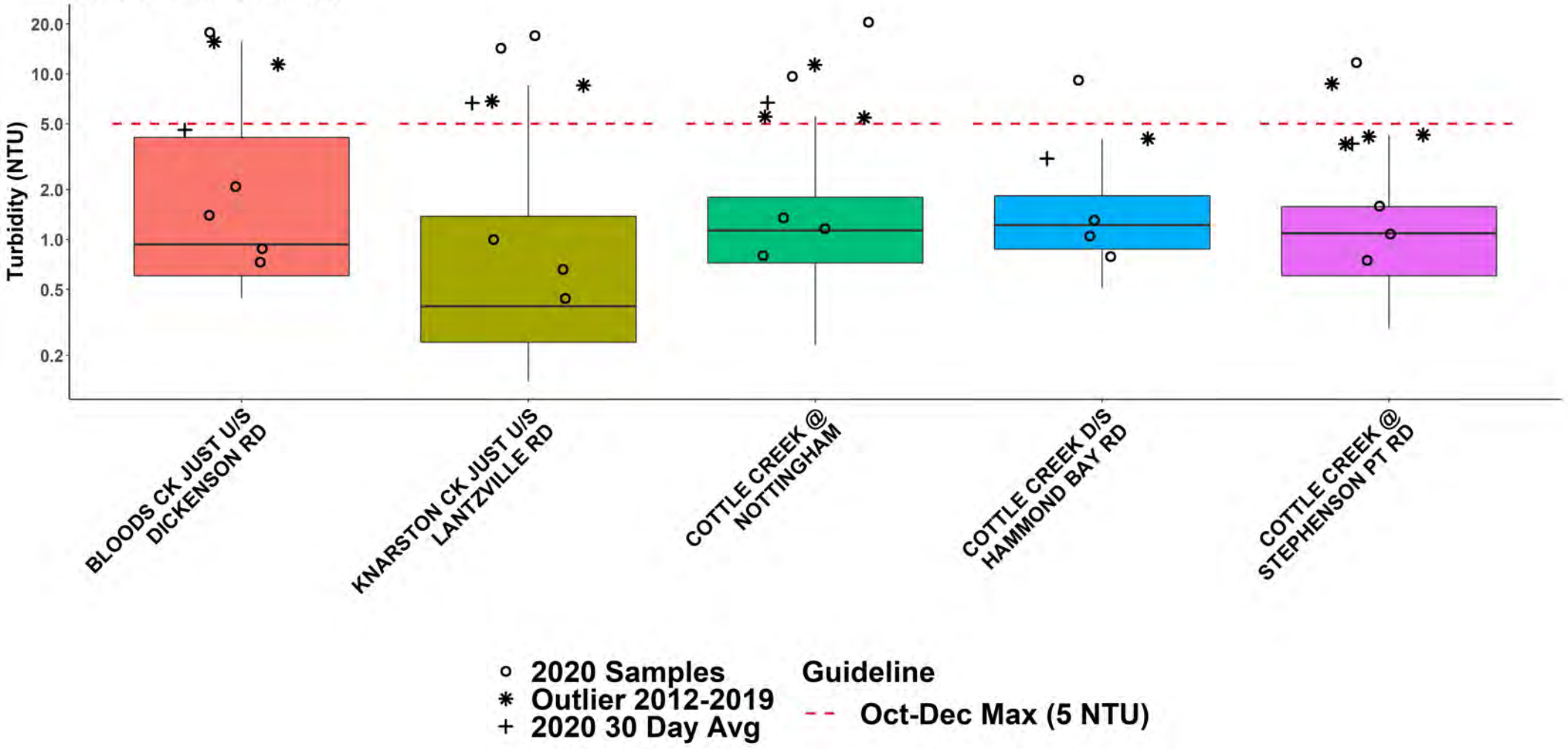


- 2020 Samples
- Outlier 2012-2019
- 2020 30 Day Avg

Guideline

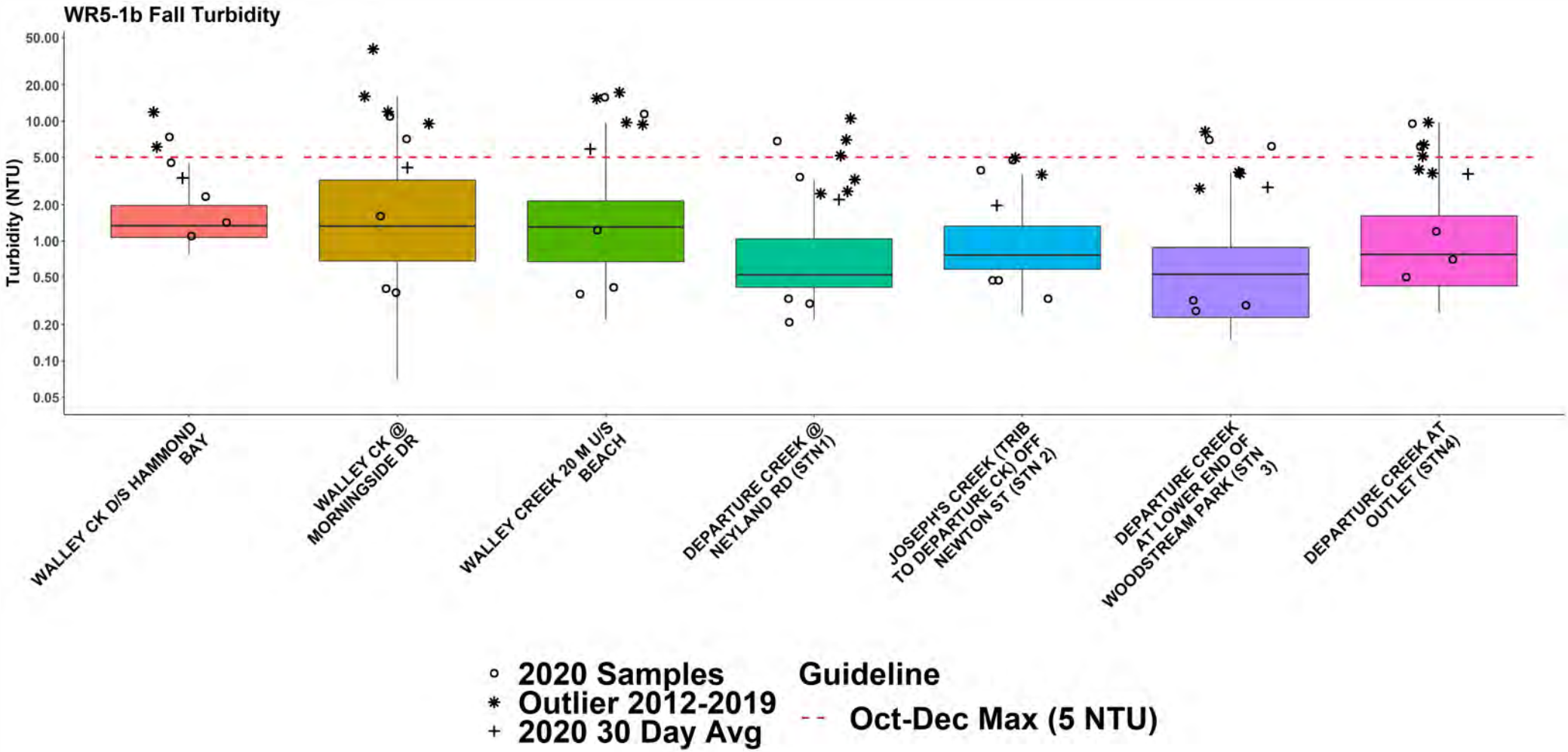
-- Jan-Sept Max (2 NTU)

WR5-1a Fall Turbidity



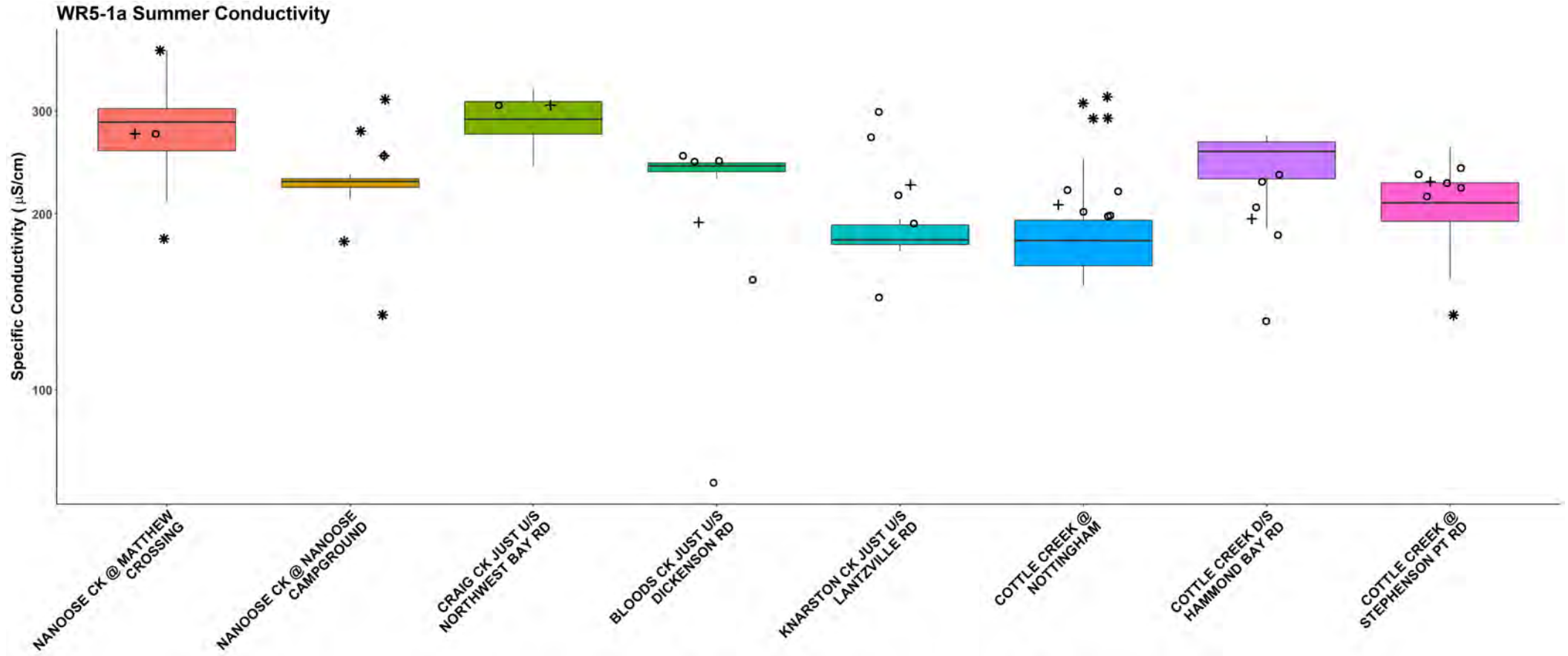
2020 Samples
Outlier 2012-2019
2020 30 Day Avg

Guideline
Oct-Dec Max (5 NTU)

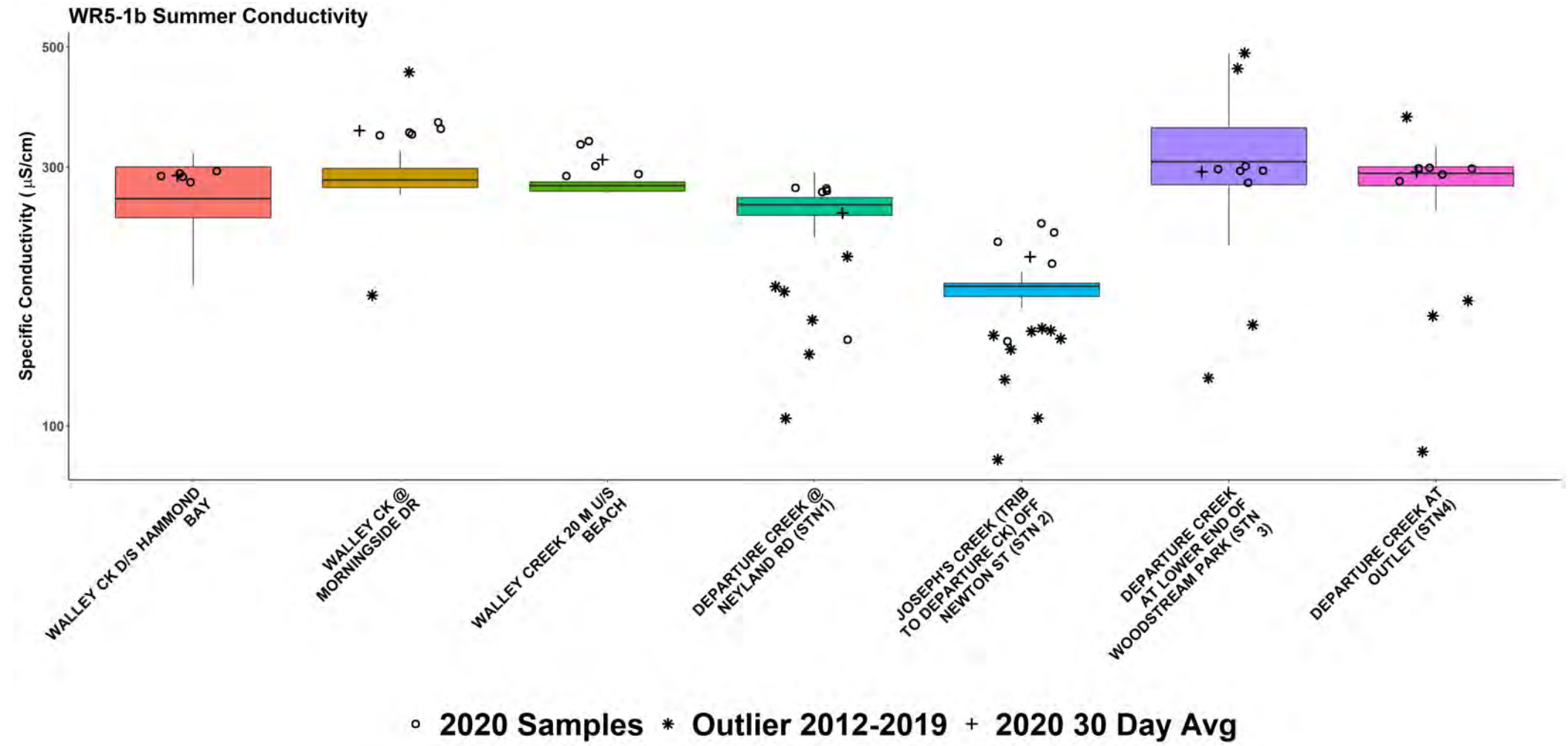


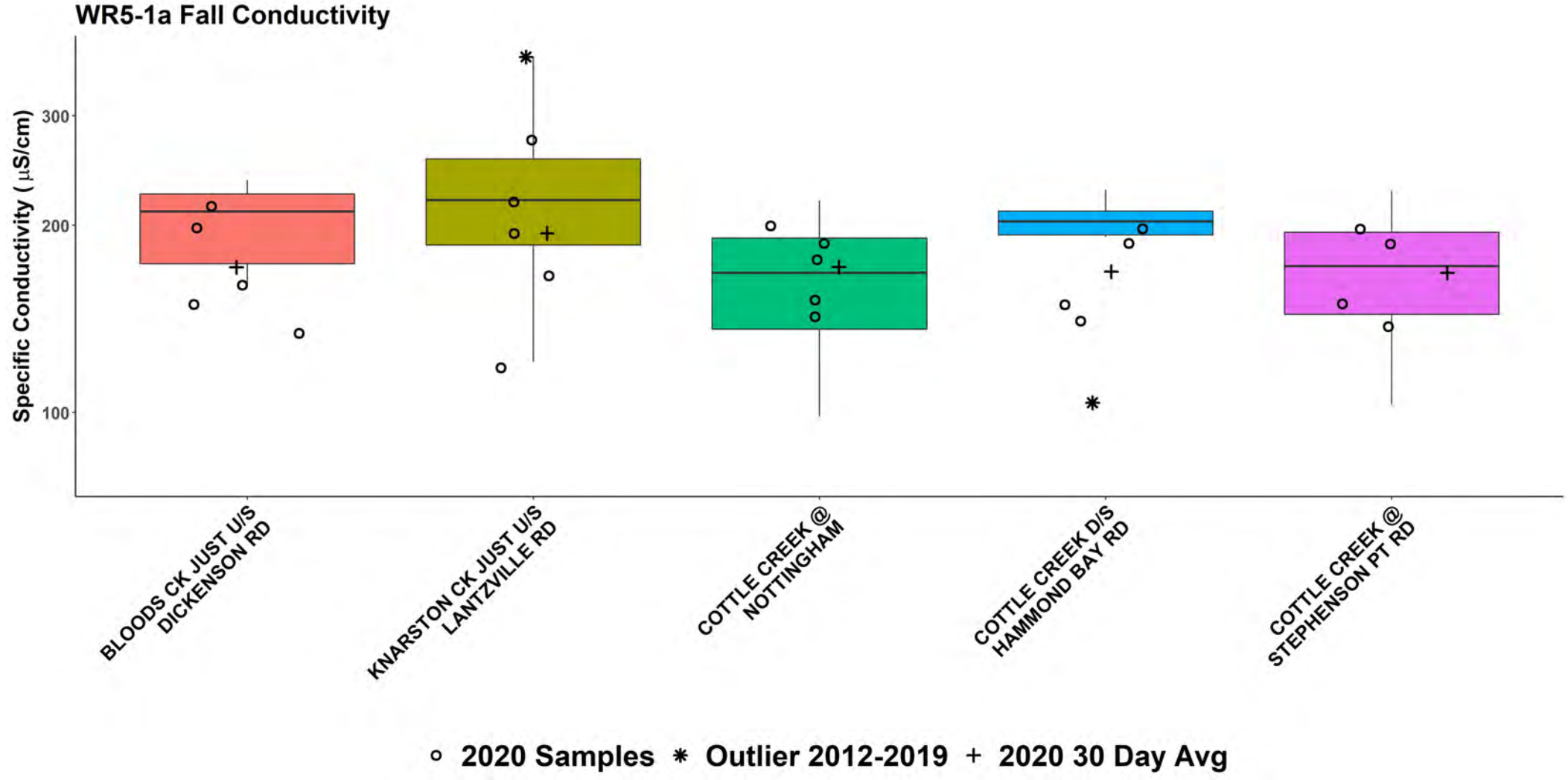
2020 Samples
Outlier 2012-2019
2020 30 Day Avg

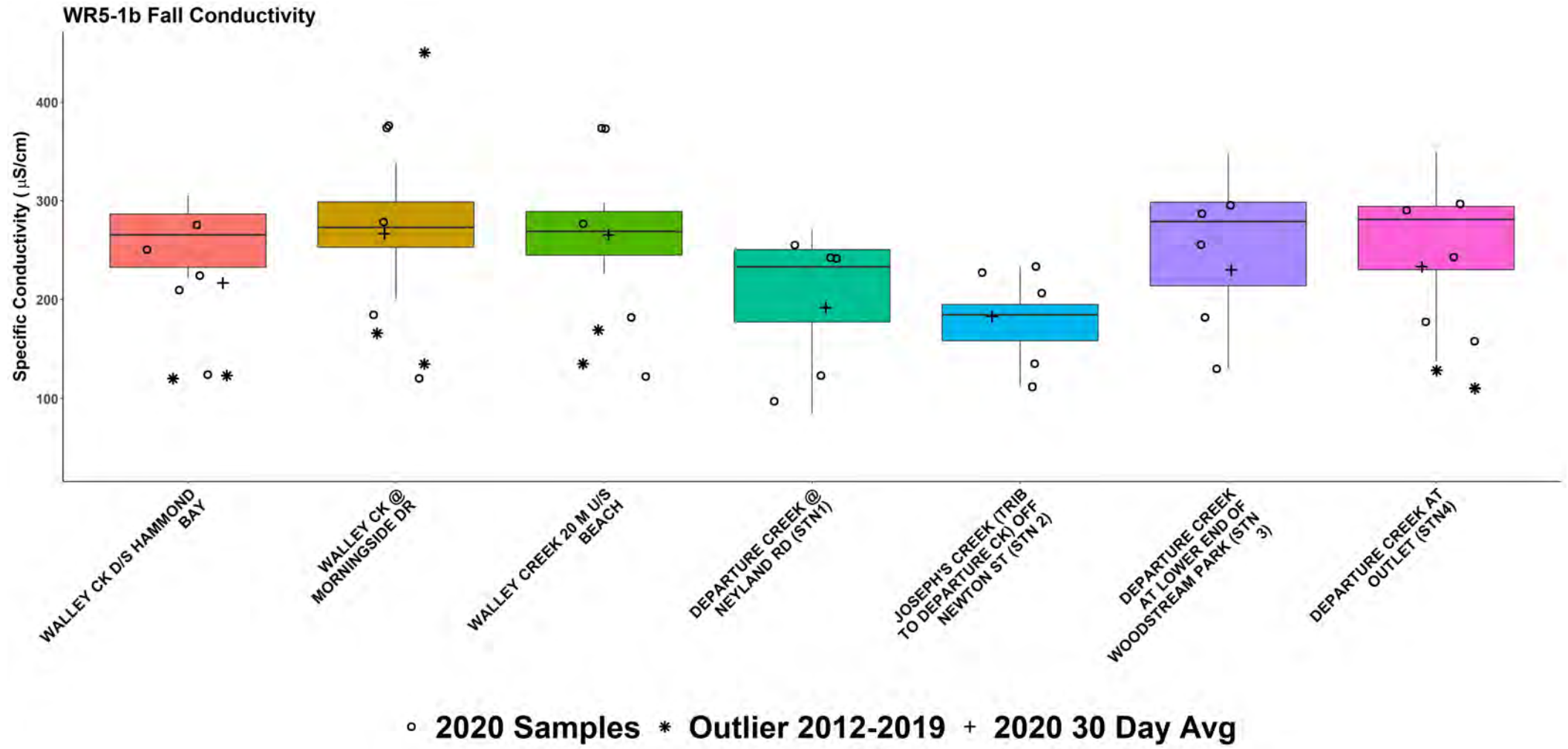
Guideline
Oct-Dec Max (5 NTU)



∘ 2020 Samples ∗ Outlier 2012-2019 + 2020 30 Day Avg


WR5-1b Summer Conductivity
Specific Conductivity (µS/cm)
500
300
100
WALLEY CK D/S HAMMOND BAY
WALLEY CK @ MORNINGSIDE DR
WALLEY CREEK 20 M U/S BEACH
DEPARTURE CREEK @ NEYLAND RD (STN1)
JOSEPH'S CREEK (TRIB TO DEPARTURE CK) OFF NEWTON ST (STN 2)
DEPARTURE CREEK AT LOWER END OF WOODSTREAM PARK (STN 3)
DEPARTURE CREEK AT OUTLET (STN4)
◦ 2020 Samples * Outlier 2012-2019 + 2020 30 Day Avg


WR5-1a Fall Conductivity
Specific Conductivity (µS/cm)
300
200
100
BLOODS CK JUST U/S DICKENSON RD
KNARSTON CK JUST U/S LANTZVILLE RD
COTTLE CREEK @ NOTTINGHAM
COTTLE CREEK D/S HAMMOND BAY RD
COTTLE CREEK @ STEPHENSON PT RD
∘ 2020 Samples ∗ Outlier 2012-2019 + 2020 30 Day Avg

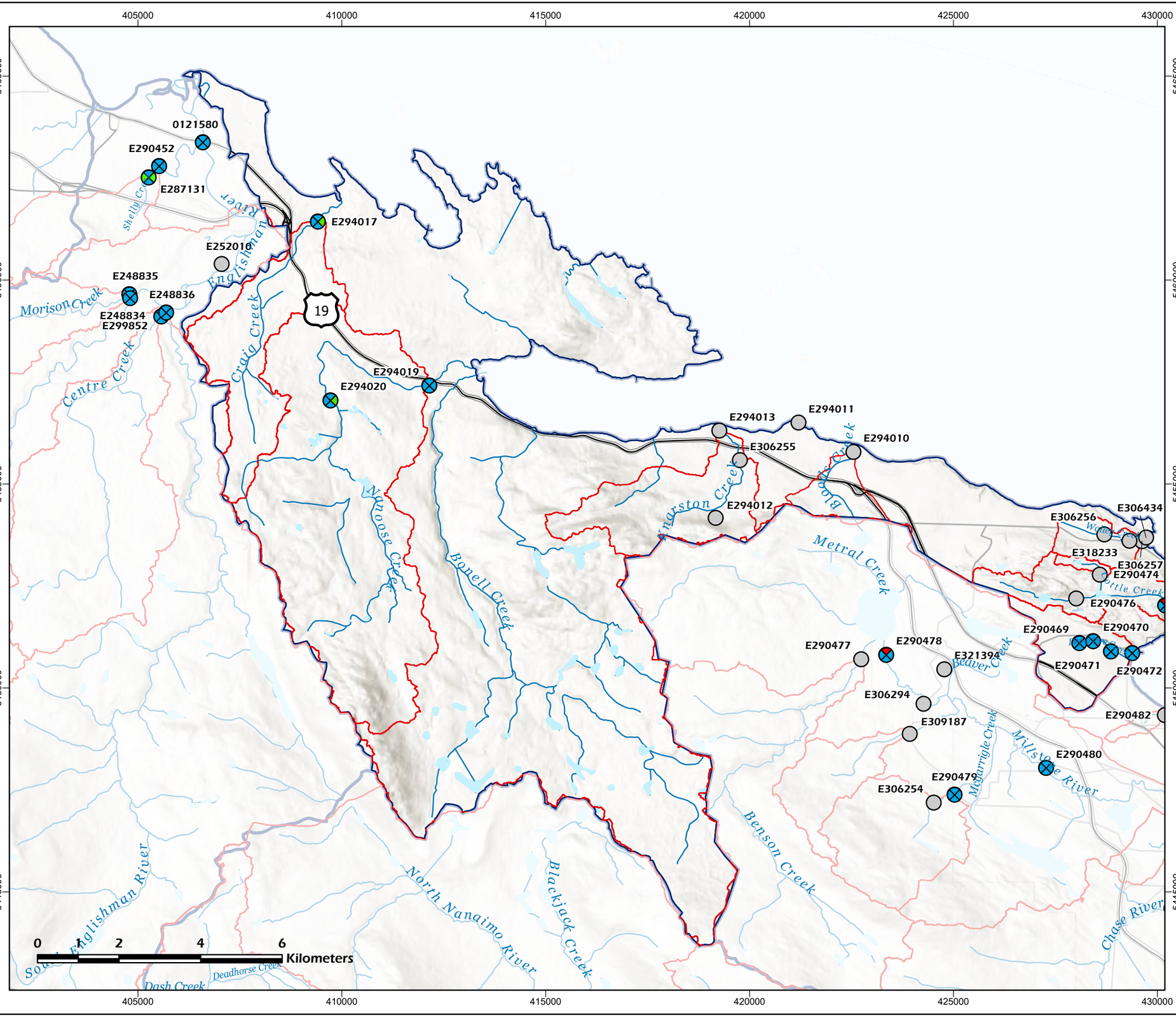

WR5-1b Fall Conductivity
Specific Conductivity (µS/cm)
400
300
200
100
WALLEY CK D/S HAMMOND BAY
WALLEY CK @ MORNINGSIDE DR
WALLEY CREEK 20 M U/S BEACH
DEPARTURE CREEK @ NEYLAND RD (STN1)
JOSEPH'S CREEK (TRIB TO DEPARTURE CK) OFF NEWTON ST (STN 2)
DEPARTURE CREEK AT LOWER END OF WOODSTREAM PARK (STN 3)
DEPARTURE CREEK AT OUTLET (STN4)
∘ 2020 Samples ∗ Outlier 2012-2019 + 2020 30 Day Avg

Regional District of Nanaimo

CMMN Water Quality Trend Analysis 2011-2020

WR5-1a: South Wellington to Nanoose

Location:	Nanaimo, BC
Project No.:	21-3702
Prepared for:	Regional District of Nanaimo
Prepared by:	Ecoscape Environmental Consultants Ltd.
Coordinate System:	NAD83-UTM Zone 10
Imagery:	ESRI Canada



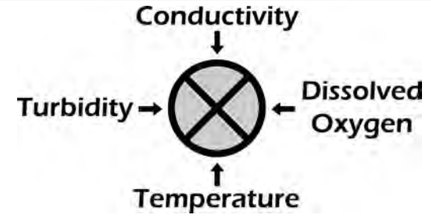
LEGEND

- Sample Site - No Trend Assessed
- Sample Site - Trend Assessed
- Highway
- Watershed
- Water Region
- Lake

Trend Color Code

- Improving
- Stable
- Degrading

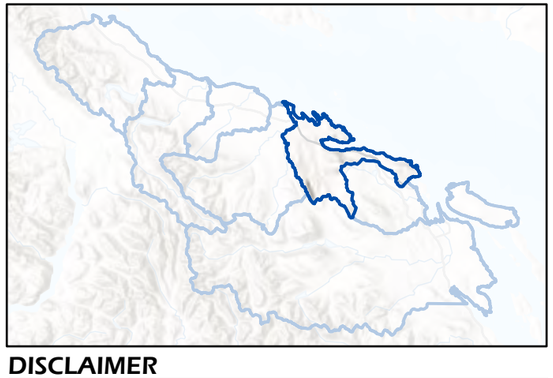
SAMPLE SITE KEY



Conductivity can be influenced by factors such as groundwater and ocean spray that are not necessarily indicative of a degrading condition. For simplicity, an increase in conductivity is categorized here as degrading.

MAP INDEX

Solid blue lines indicate entire water region; extent of main view map may be scaled to better visualize sample -site-dense regions.



DISCLAIMER

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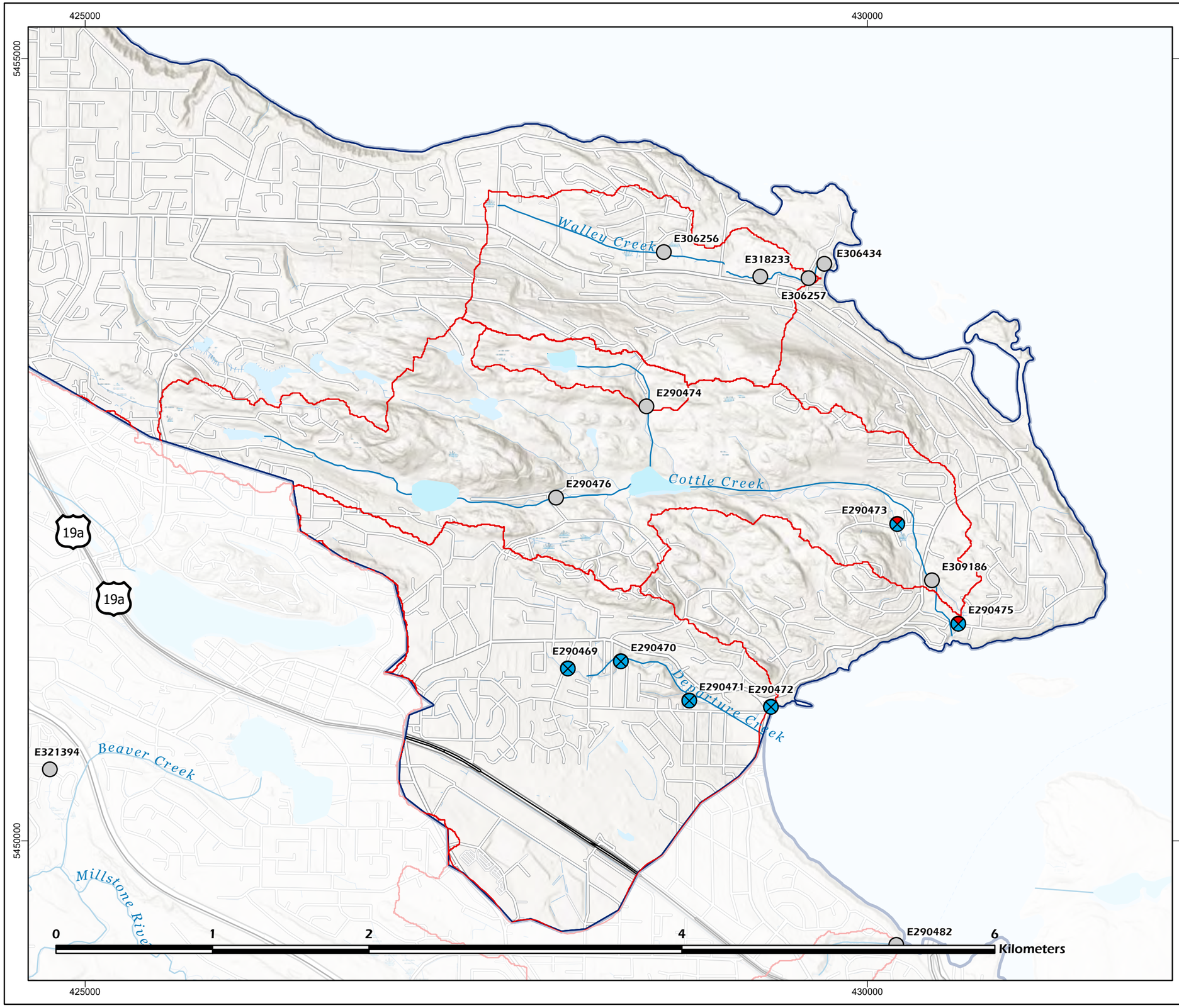
Regional District of Nanaimo

CMMN Water Quality Trend Analysis 2011-2020

WR5-1b: South Wellington to Nanoose

Location:	Nanaimo, BC
Project No.:	21-3702
Prepared for:	Regional District of Nanaimo
Prepared by:	Ecoscape Environmental Consultants Ltd.
Coordinate System:	NAD83-UTM Zone 10
Imagery:	ESRI Canada



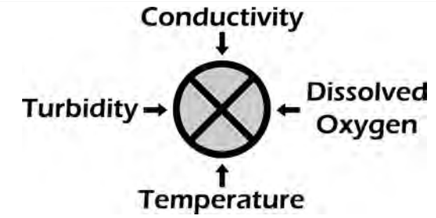
LEGEND

- Sample Site - No Trend Assessed
- Sample Site - Trend Assessed
- Highway
- Watershed
- Water Region
- Lake

Trend Color Code

- Improving
- Stable
- Degrading

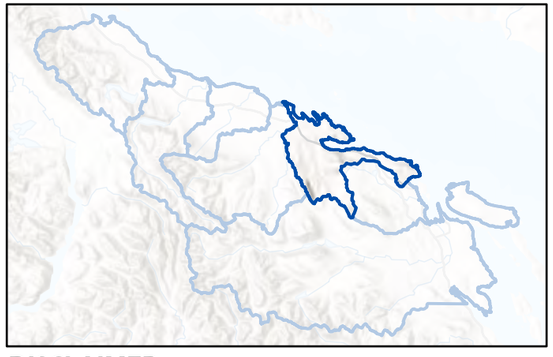
SAMPLE SITE KEY



Conductivity can be influenced by factors such as groundwater and ocean spray that are not necessarily indicative of a degrading condition. For simplicity, an increase in conductivity is categorized here as degrading.

MAP INDEX

Solid blue lines indicate entire water region; extent of main view map may be scaled to better visualize sample -site-dense regions.



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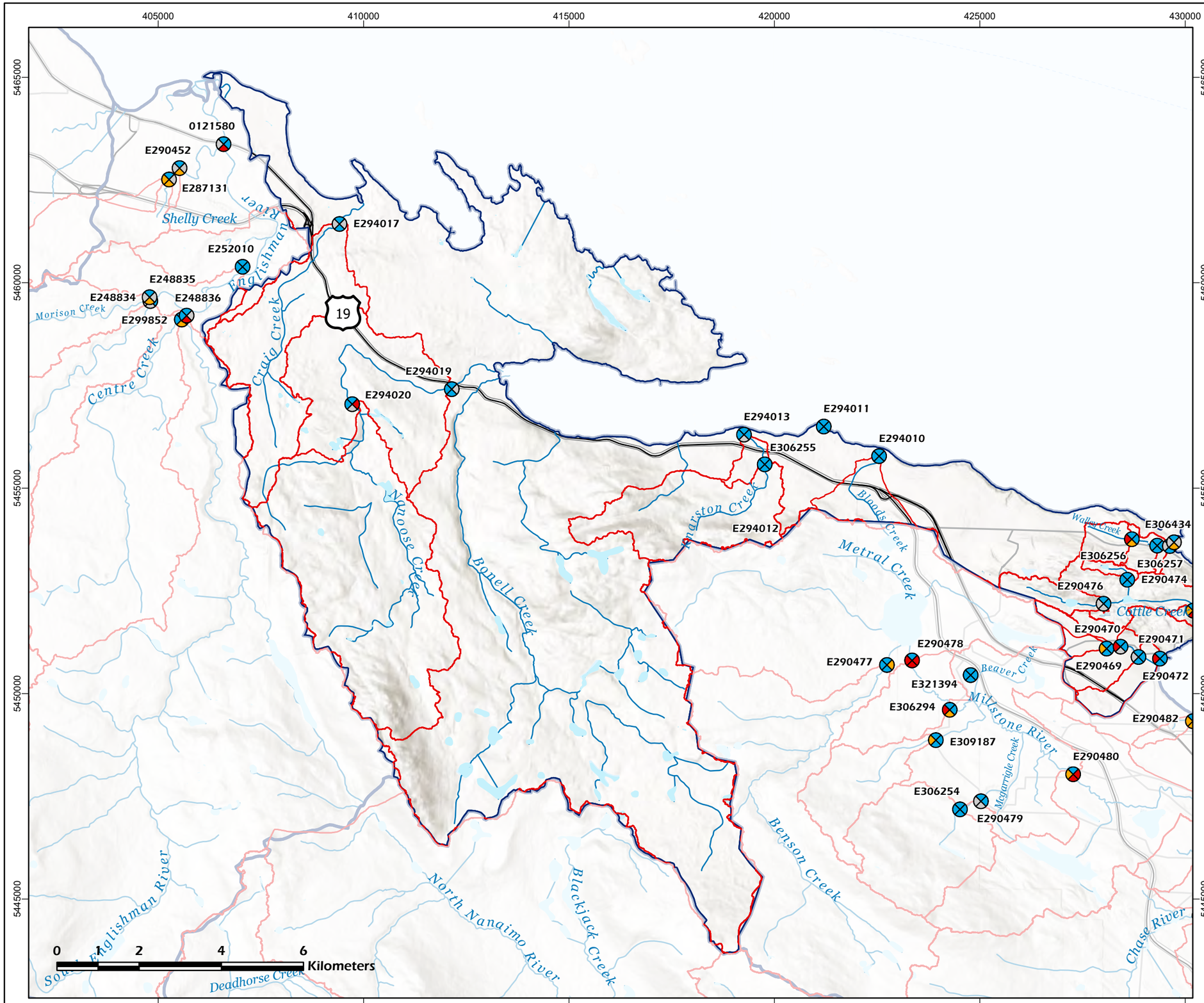
Regional District of Nanaimo

CMMN 2011-2020 Summer Exceedance Assessment

WR5-1a: South Wellington to Nanoose

Location:	Nanaimo, BC
Project No.:	21-3702
Prepared for:	Regional District of Nanaimo
Prepared by:	Ecoscape Environmental Consultants Ltd.
Coordinate System:	NAD83-UTM Zone 10
Imagery:	ESRI Canada



LEGEND

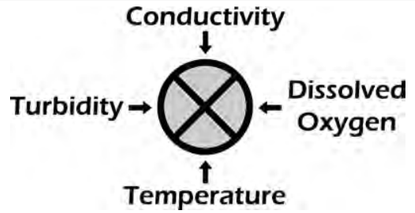
- Sample Site
- Highway
- Stream
- Watershed
- Water Region
- Lake

Note the exceedance frequency categories are reflective of the number of sample periods with exceedances, not the number or values of the exceedances.

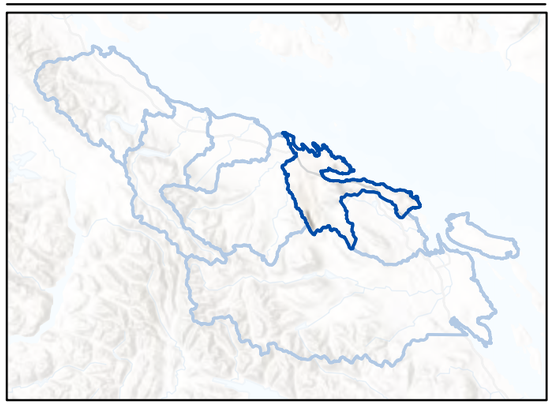
Exceedance colour key

- No exceedance recorded
- Low exceedance frequency
- Moderate exceedance frequency
- High exceedance frequency

SAMPLE SITE KEY



MAP INDEX



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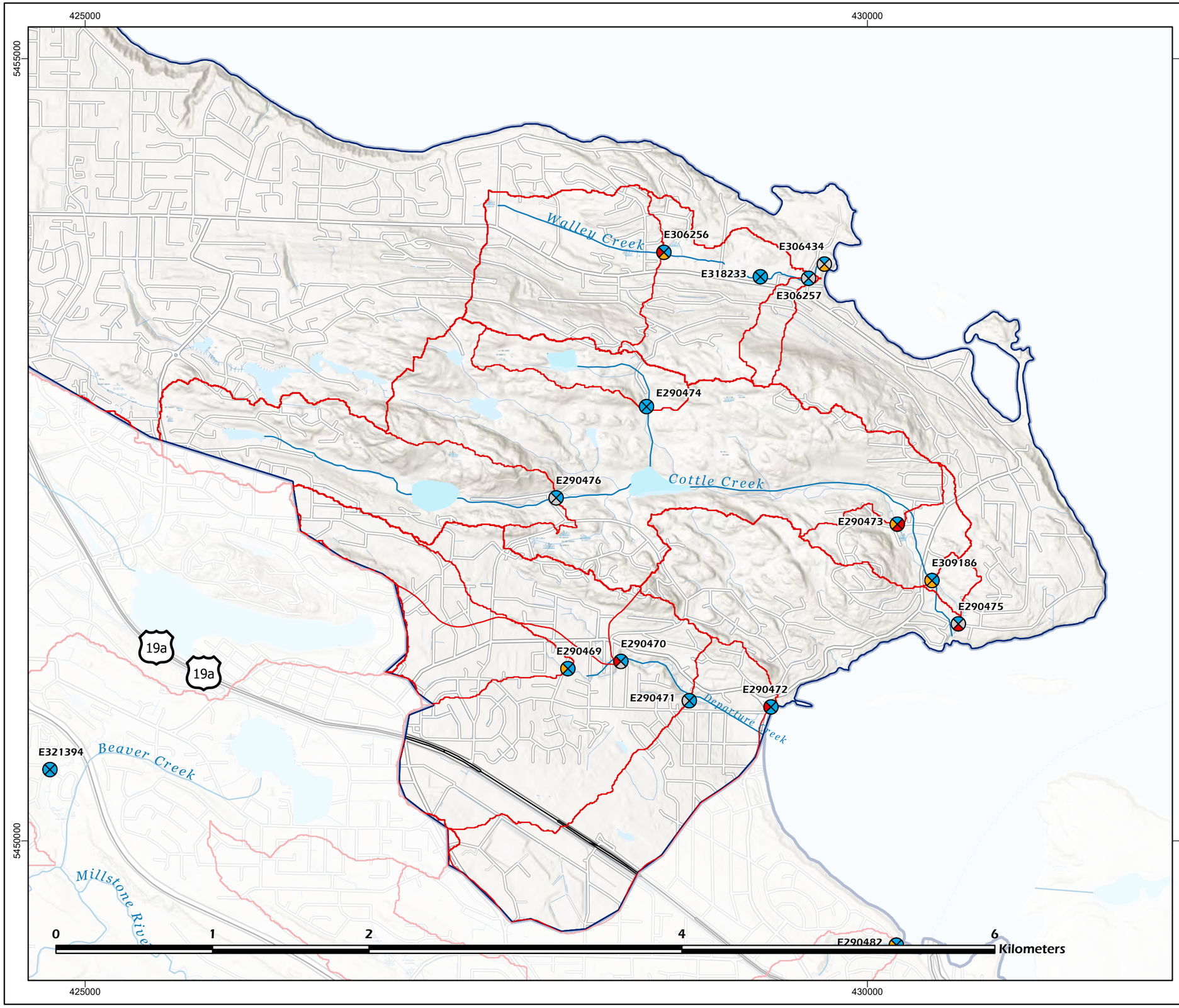
Regional District of Nanaimo

CMMN 2011-2020 Summer Exceedance Assessment

WR5-1b: South Wellington to Nanoose

Location:	Nanaimo, BC
Project No.:	21-3702
Prepared for:	Regional District of Nanaimo
Prepared by:	Ecoscape Environmental Consultants Ltd.
Coordinate System:	NAD83-UTM Zone 10
Imagery:	ESRI Canada



LEGEND

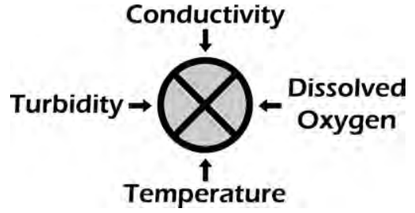
- Sample Site
- Highway
- Stream
- Watershed
- Water Region
- Lake

Note the exceedance frequency categories are reflective of the number of sample periods with exceedances, not the number or values of the exceedances.

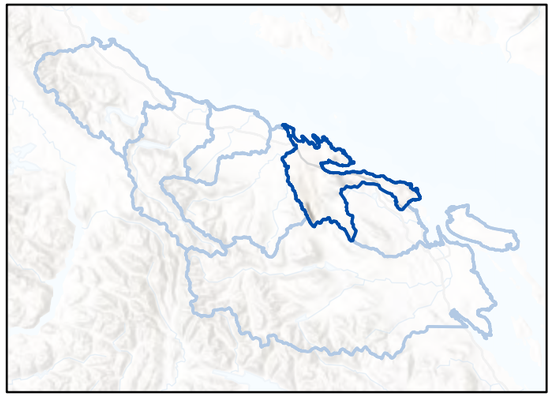
Exceedance colour key

- No exceedance recorded
- Low exceedance frequency
- Moderate exceedance frequency
- High exceedance frequency

SAMPLE SITE KEY



MAP INDEX



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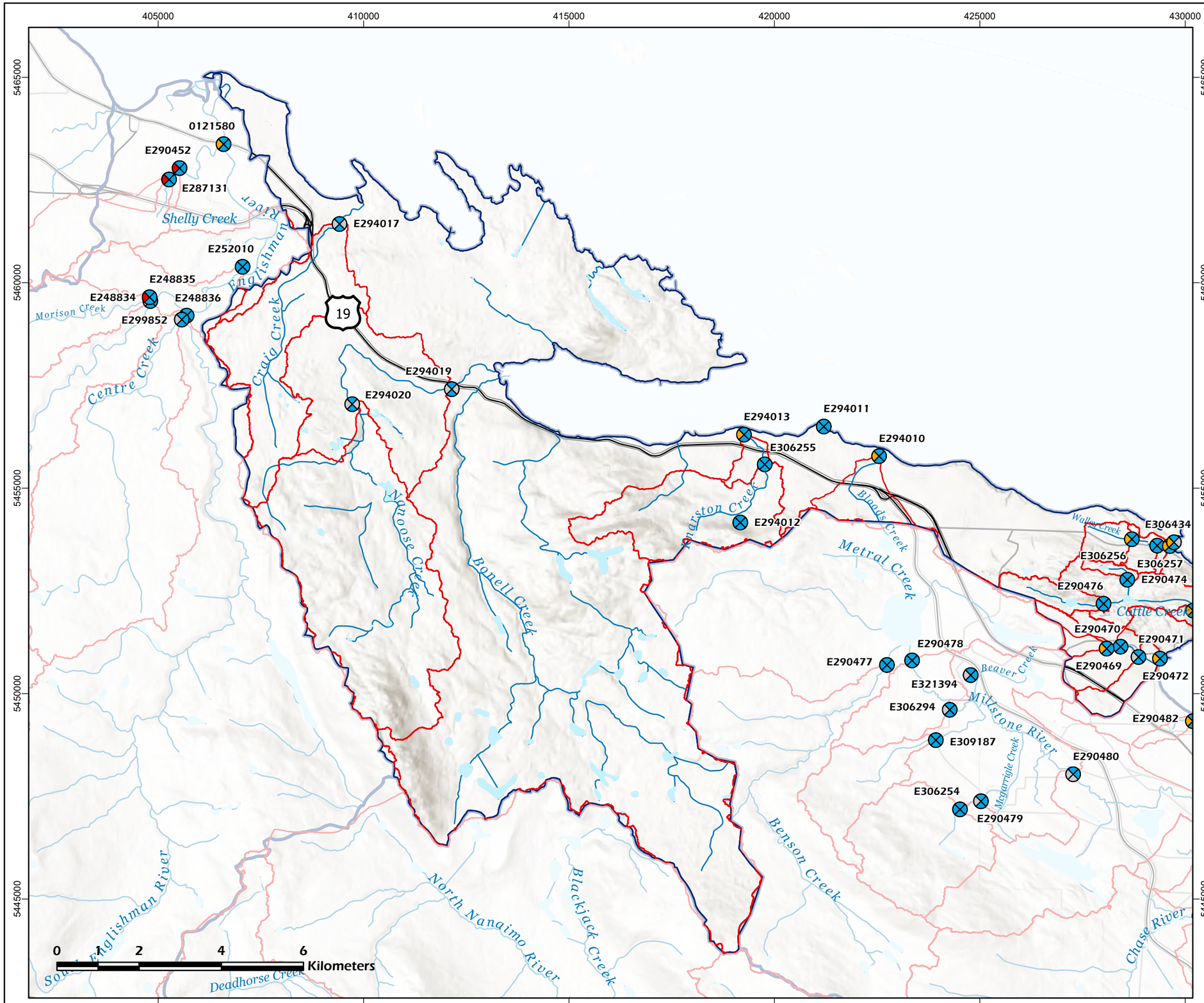
Regional District of Nanaimo

CMMN 2011-2020 Fall Exceedance Assessment

WR5-1a: South Wellington to Nanoose

Location:	Nanaimo, BC
Project No.:	21-3702
Prepared for:	Regional District of Nanaimo
Prepared by:	Ecoscape Environmental Consultants Ltd.
Coordinate System:	NAD83-UTM Zone 10
Imagery:	ESRI Canada



LEGEND

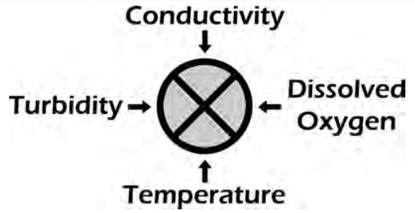
- Sample Site
- Stream
- Highway
- Watershed
- Water Region
- Lake

Note the exceedance frequency categories are reflective of the number of sample periods with exceedances, not the number or values of the exceedances.

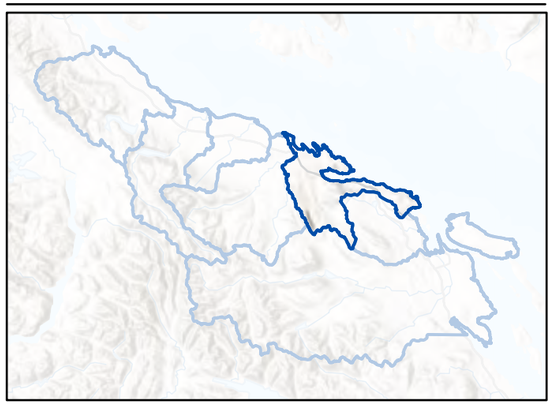
Exceedance colour key

- No exceedance recorded
- Low exceedance frequency
- Moderate exceedance frequency
- High exceedance frequency

SAMPLE SITE KEY



MAP INDEX



DISCLAIMER

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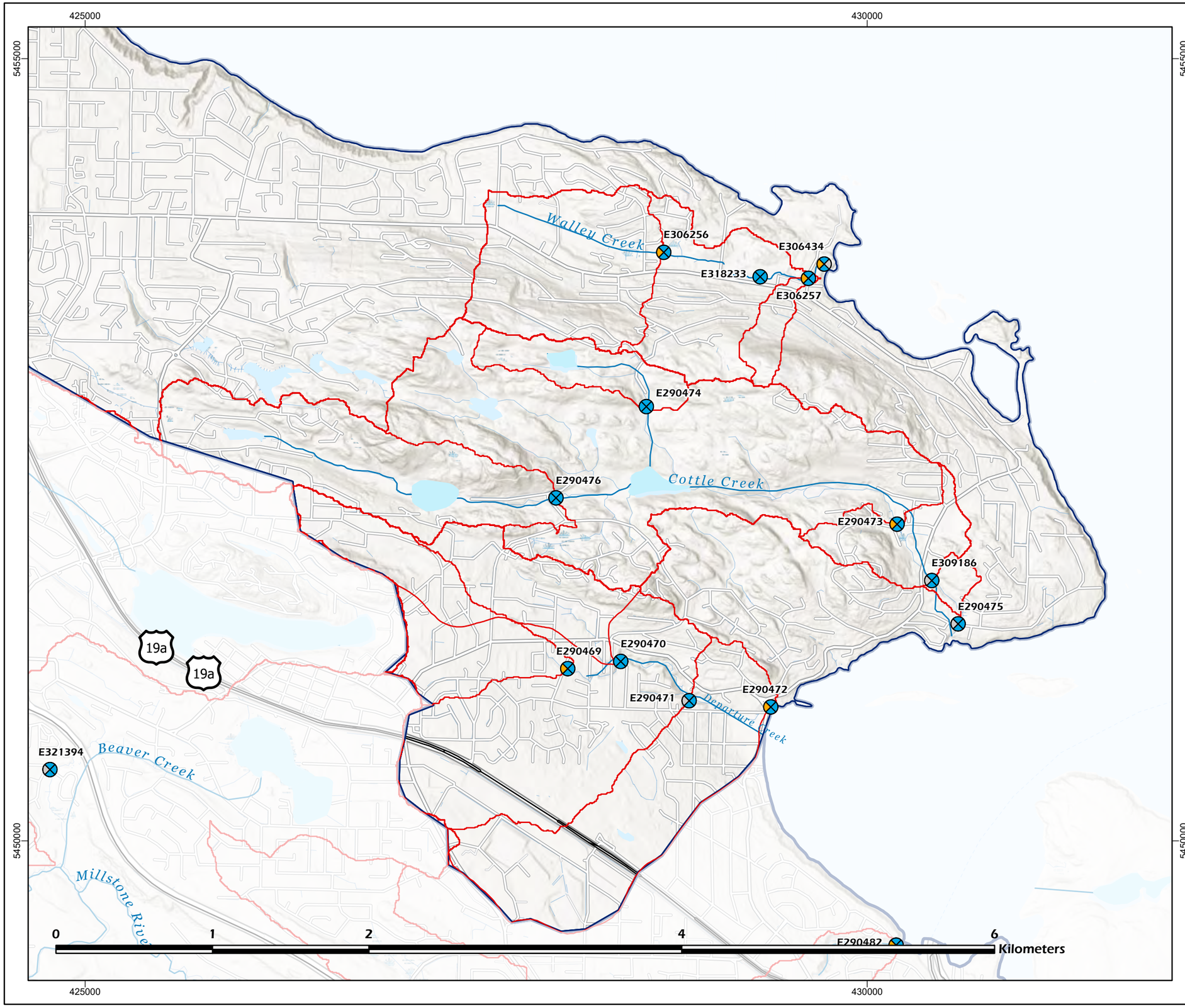
Regional District of Nanaimo

CMMN 2011-2020 Fall Exceedance Assessment

WR5-1b: South Wellington to Nanoose

Location:	Nanaimo, BC
Project No.:	21-3702
Prepared for:	Regional District of Nanaimo
Prepared by:	Ecoscape Environmental Consultants Ltd.
Coordinate System:	NAD83-UTM Zone 10
Imagery:	ESRI Canada



LEGEND

- Sample Site
- Stream
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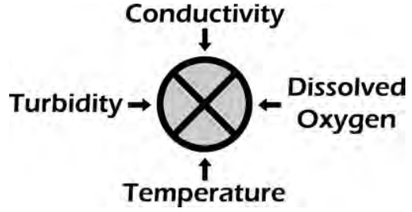
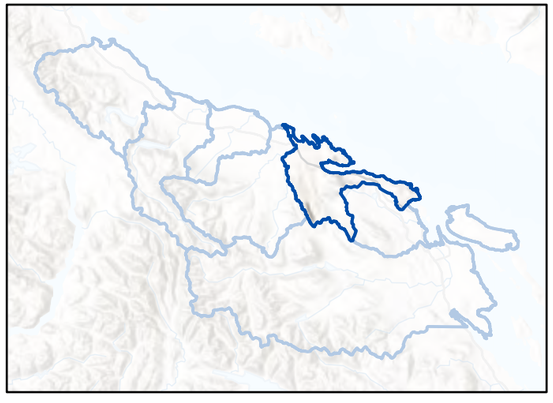
SAMPLE SITE KEY



MAP INDEX



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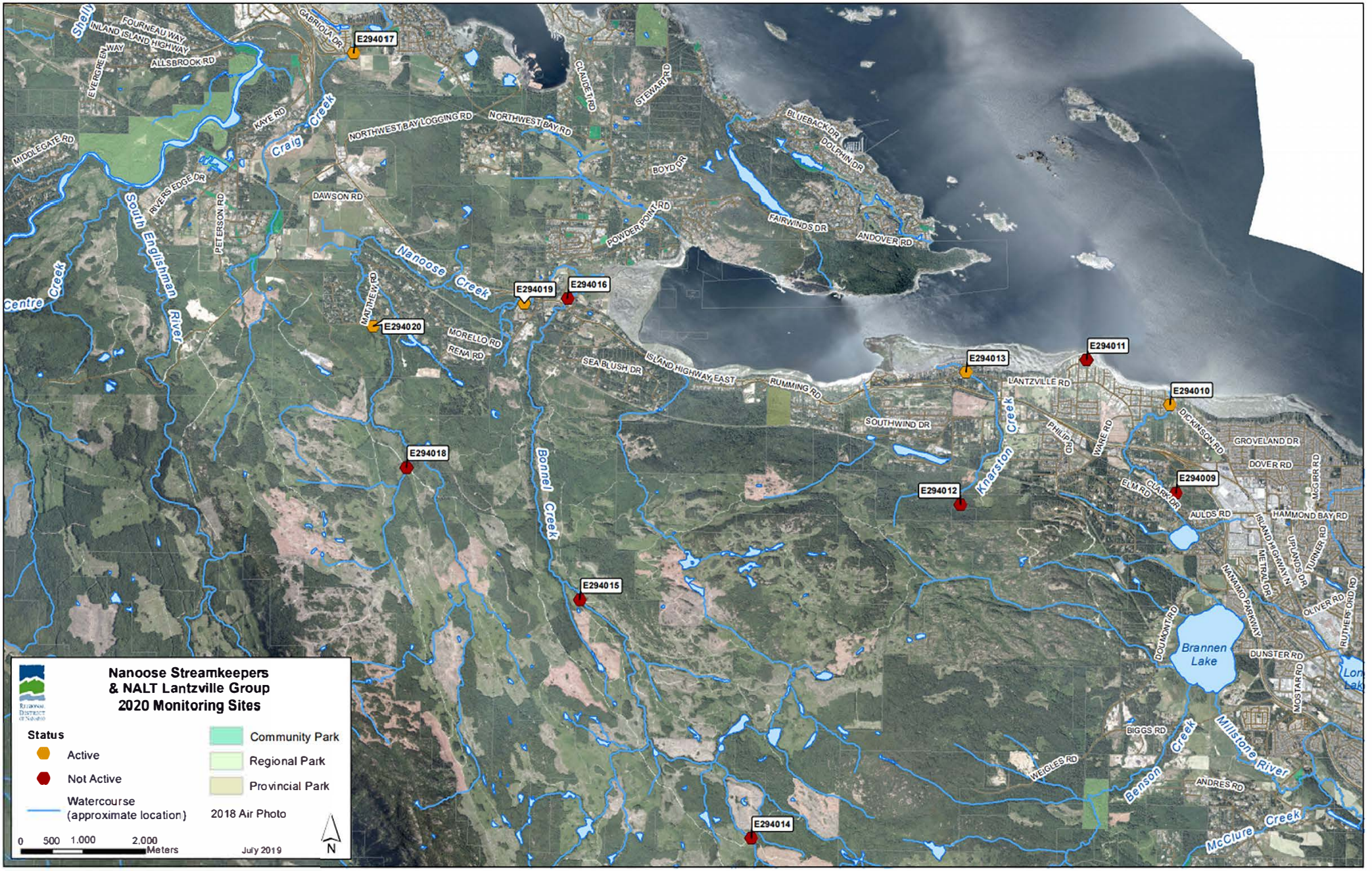
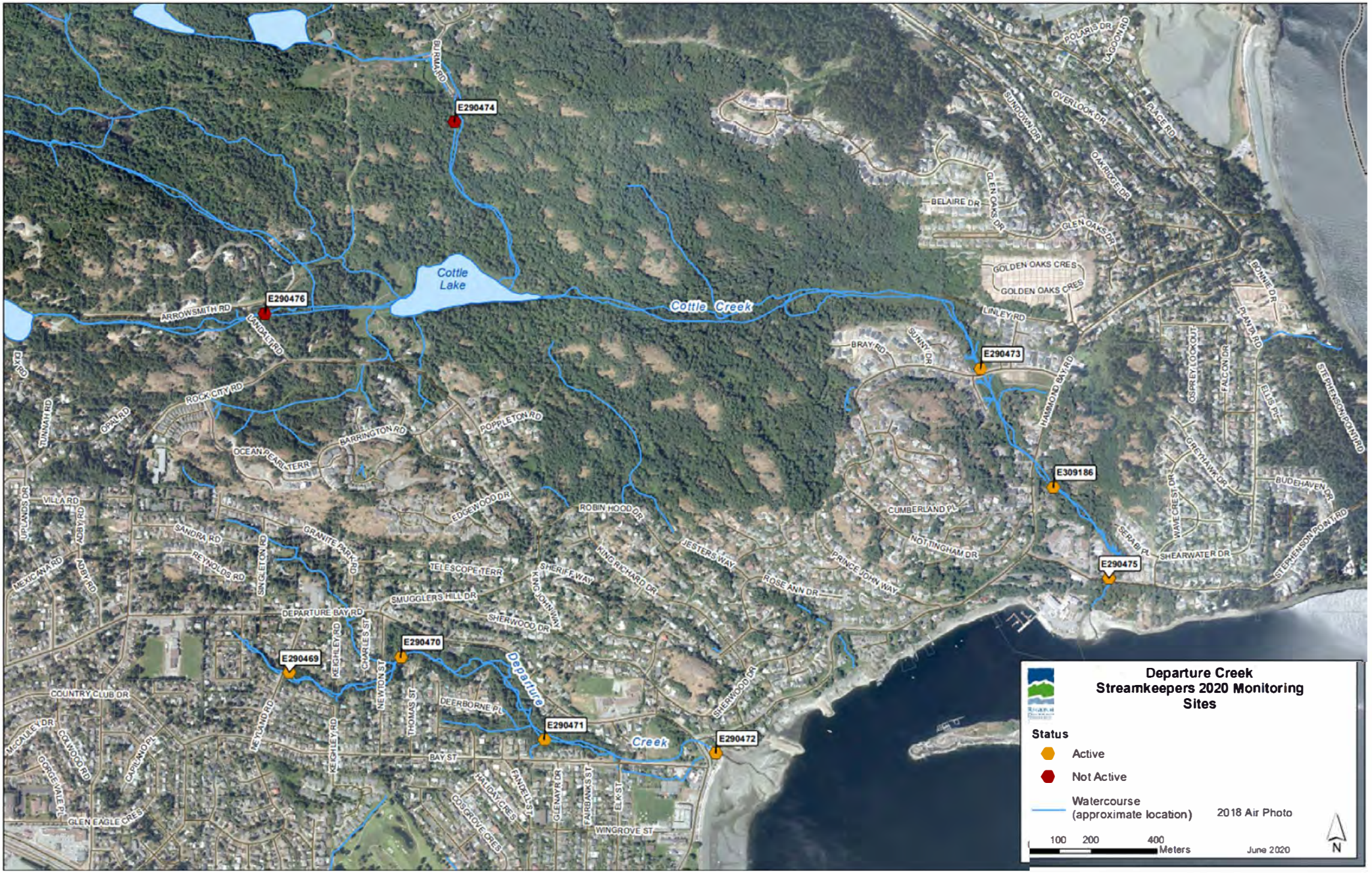

Nanoose Streamkeepers
& NALT Lantzville Group
2020 Monitoring Sites
Status
Active
Not Active
Watercourse
(approximate location)
Community Park
Regional Park
Provincial Park
2018 Air Photo
0 500 1,000 2,000
Meters
July 2019
N
E294017
E294019
E294016
E294020
E294018
E294015
E294014
E294013
E294011
E294010
E294012
E294009
Craig Creek
Nanoose Creek
Bonnel Creek
Knarston Creek
Benson Creek
Millstone River
McClure Creek
South Englishman River
Centre Creek
Brannen Lake
FOURNEAU WAY
INLAND ISLAND HIGHWAY
ALLSBROOK RD
EVERGREEN WAY
GABRIOLA DR
KAYE RD
MIDDLEGATE RD
RIVERS EDGE DR
PETERSON RD
DAWSON RD
NORTHWEST BAY LOGGING RD
NORTHWEST BAY RD
CLAUDET RD
STEWART RD
BOYD DR
POWDER POINT RD
BLUEBACK DR
DOLPHIN DR
FAIRWINDS DR
ANDOVER RD
MATTHEW RD
MORELLO RD
RENA RD
SEA BLUSH DR
ISLAND HIGHWAY EAST
RUMMING RD
SOUTHWIND DR
LANTZVILLE RD
PHILIP RD
WARE RD
DICKINSON RD
GROVELAND DR
DOVER RD
ELM RD
CLARK DR
AULDS RD
HAMMOND BAY RD
ISLAND HIGHWAY N
METRAL DR
UPLANDS DR
TURNER RD
NANAIMO PARKWAY
OLIVER RD
RUTHERFORD RD
DOUMONT RD
DUNSTER RD
MOSTAR RD
BIGGS RD
WEIGLES RD
ANDRES RD
McGIRR RD


E290474
E290476
E290473
E309186
E290475
E290470
E290469
E290471
E290472
Cottle Lake
Cottle Creek
Departure Creek
Creek
BURMA RD
ARROWSMITH RD
LANDALE RD
ROCK CITY RD
BARRINGTON RD
POPPLETON RD
OCEAN PEARL TERR
EDGEWOOD DR
ROBIN HOOD DR
JESTERS WAY
KING RICHARD DR
SHERIFF WAY
PRINCE JOHN WAY
ROSE ANN DR
NOTTINGHAM DR
CUMBERLAND PL
TELESCOPE TERR
SMUGGLERS HILL DR
SHERWOOD DR
DEPARTURE BAY RD
DEERBORNE PL
BAY ST
WINGROVE ST
COSGROVE CRES
HALIDAY CRES
FANDELL ST
GLENAYR DR
FAIRBANKS ST
ELK ST
SHERWOOD DR
COUNTRY CLUB DR
GLEN EAGLE CRES
GEORGEVALE PL
CALWOOD RD
CAPILANO PL
MCCAULEY DR
HEYLAND RD
KEIGHLEY RD
NEIGHLEY RD
NEWTON ST
CHARLES ST
THOMAS ST
JOHN WAY
SINGLETON RD
REYNOLDS RD
SANDRA RD
GRANITE PARK DR
MEXICANA RD
ABBEY RD
VILLA RD
UPLANDS DR
TUNNEY RD
CRAIG RD
BELAIRE DR
GLEN OAKS DR
GLEN OAKS PL
GOLDEN OAKS CRES
LINLEY RD
BRAY RD
SUNNY DR
HAMMOND BAY RD
SUNDOWN DR
OVERLOOK DR
OAKRIDGE DR
POLARIS DR
LAGOON RD
RACE RD
BONNIE DR
PLANZA RD
OSPREY LOOKOUT
FALCON DR
ELLIS PL
GREENHAWK DR
WAVECREST DR
SEABIRD PL
SHEARWATER DR
BUDEHAVEN DR
STEPHENSON POINT RD
STEPHENSON POINT RD
Departure Creek
Streamkeepers 2020 Monitoring
Sites
Status
Active
Not Active
Watercourse
(approximate location)
2018 Air Photo
100 200 400
Meters
June 2020
N

Walley Creek Streamkeepers
2020 Monitoring Sites
Status
Active
Not Active
Watercourse
(approximate location)
2018 Air Photo
0 85 170 340
Meters
July 2020
N
Walley Creek
E306256
E318233
E306257
E306434
FILLINGER CRES
HERITAGE DR
BANNING COURT
VISTA VIEW CRES
BELLA VISTA CRES
HINRICH VIEW
FINNERTY CRES
DENFORD PL
NEY DR
HARTWIG CRES
LOGANS RUN
VISTA VIEW CRES
McGUFFIE RD
BAYSHORE DR
ENTHWHISTLE DR
CARRIAGE DR
LESLIE CRES
WILLIAMSON RD
JACOBS LN
NORTON RD
FOX PL
HAMMOND BAY RD
DUNN PL
MORGAN PL
RILEY PL
LAGUNA WAY
SHERIDAN RIDGE RD
EWEN PL
GULFVIEW DR
TIKI WAY
TIKI LANE
MORNINGSIDE DR
PIPER CRES
LOST LAKE RD
BLUE JAY TRAIL
TANYA DR
AMBIENCE DR
BURMA RD
POLARIS DR