

General Statistics

Total Number of Observations	27	Number of Distinct Observations	26
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Raw Statistics

Minimum	5.8
Maximum	1612
Second Largest	1366
First Quartile	280
Median	390.5
Third Quartile	938.8
Mean	565.1
SD	424.7
Coefficient of Variation	0.751
Skewness	1.006

Log-Transformed Statistics

Minimum	1.758
Maximum	7.385
Second Largest	7.22
First Quartile	5.635
Median	5.967
Third Quartile	6.845
Mean	5.963
SD	1.113

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.891
Shapiro Wilk Critical Value	0.923

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.827
Shapiro Wilk Critical Value	0.923

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage	1334
95% UPL (t)	1303
90% Percentile (z)	1109
95% Percentile (z)	1264
99% Percentile (z)	1553

Assuming Lognormal Distribution

95% UTL with 90% Coverage	2920
95% UPL (t)	2689
90% Percentile (z)	1620
95% Percentile (z)	2427
99% Percentile (z)	5183

Gamma Distribution Test

k star	1.342
Theta Star	421.1
nu star	72.48

A-D Test Statistic	0.423
5% A-D Critical Value	0.763
K-S Test Statistic	0.125
5% K-S Critical Value	0.171

Data appear Gamma Distributed at 5% Significance Level

Data Distribution Test

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Statistics

90% Percentile	1277
95% Percentile	1514
99% Percentile	1612

Assuming Gamma Distribution

90% Percentile	1210
95% Percentile	1528
99% Percentile	2252

95% UTL with 90% Coverage	1366
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95% Percentile Bootstrap UTL with 90% Coverage	1440
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95% BCA Bootstrap UTL with 90% Coverage	1366
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95% UPL	1514
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95% Chebyshev UPL	2450
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Upper Threshold Limit Based upon IQR	1927
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Note: UPL (or upper percentile for gamma distributed data) represents a preferred estimate of BTV

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	26
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Raw Statistics

Minimum	5.8
Maximum	1612
Mean	565.1
Median	390.5
SD	424.7
Coefficient of Variation	0.751
Skewness	1.006

Log-transformed Statistics

Minimum of Log Data	1.758
Maximum of Log Data	7.385
Mean of log Data	5.963
SD of log Data	1.113

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.891
Shapiro Wilk Critical Value	0.923

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.827
Shapiro Wilk Critical Value	0.923

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	704.5
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95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	716.5
95% Modified-t UCL	707.2

Assuming Lognormal Distribution

95% H-UCL	1278
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95% Chebyshev (MVUE) UCL	1458
97.5% Chebyshev (MVUE) UCL	1787
99% Chebyshev (MVUE) UCL	2433

Gamma Distribution Test

k star (bias corrected)	1.342
Theta Star	421.1
nu star	72.48
Approximate Chi Square Value (.05)	53.87
Adjusted Level of Significance	0.0401
Adjusted Chi Square Value	52.85
Anderson-Darling Test Statistic	0.423
Anderson-Darling 5% Critical Value	0.763
Kolmogorov-Smirnov Test Statistic	0.125
Kolmogorov-Smirnov 5% Critical Value	0.171

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	760.3
95% Adjusted Gamma UCL	775

Potential UCL to Use

Data Distribution

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Statistics

95% CLT UCL	699.5
95% Jackknife UCL	704.5
95% Standard Bootstrap UCL	696
95% Bootstrap-t UCL	729.6
95% Hall's Bootstrap UCL	707.3
95% Percentile Bootstrap UCL	695.7
95% BCA Bootstrap UCL	703.7
95% Chebyshev(Mean, Sd) UCL	921.4
97.5% Chebyshev(Mean, Sd) UCL	1076
99% Chebyshev(Mean, Sd) UCL	1378

Use 95% Approximate Gamma UCL 760.3

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
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Raw Statistics

Minimum	9.6
Maximum	50
Second Largest	48.7
First Quartile	16.83
Median	24.35
Third Quartile	34.78
Mean	26.73
SD	12.49
Coefficient of Variation	0.467
Skewness	0.578

Log-Transformed Statistics

Minimum	2.262
Maximum	3.912
Second Largest	3.886
First Quartile	2.819
Median	3.192
Third Quartile	3.549
Mean	3.177
SD	0.495

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.887

Data appear Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.969
Shapiro Wilk Critical Value	0.887

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage	52.11
95% UPL (t)	49.29
90% Percentile (z)	42.73
95% Percentile (z)	47.27
99% Percentile (z)	55.78

Assuming Lognormal Distribution

95% UTL with 90% Coverage	65.52
95% UPL (t)	58.59
90% Percentile (z)	45.18
95% Percentile (z)	54.08
99% Percentile (z)	75.75

Gamma Distribution Test

k star	3.91
Theta Star	6.835
nu star	125.1

A-D Test Statistic	0.16
5% A-D Critical Value	0.741
K-S Test Statistic	0.0806
5% K-S Critical Value	0.216

Data appear Gamma Distributed at 5% Significance Level

Data Distribution Test

Data appear Normal at 5% Significance Level

Nonparametric Statistics

90% Percentile	49.09
95% Percentile	50
99% Percentile	50

Assuming Gamma Distribution

90% Percentile	44.84
95% Percentile	52.12
99% Percentile	67.68

95% UTL with 90% Coverage	50
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95% Percentile Bootstrap UTL with 90% Coverage	50
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95% BCA Bootstrap UTL with 90% Coverage	50
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95% UPL	50
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95% Chebyshev UPL	82.84
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Upper Threshold Limit Based upon IQR	61.7
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Note: UPL (or upper percentile for gamma distributed data) represents a preferred estimate of BTV

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	16
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Raw Statistics

Minimum	9.6
Maximum	50
Mean	26.73
Median	24.35
SD	12.49
Coefficient of Variation	0.467
Skewness	0.578

Log-transformed Statistics

Minimum of Log Data	2.262
Maximum of Log Data	3.912
Mean of log Data	3.177
SD of log Data	0.495

Relevant UCL Statistics**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.887

Data appear Normal at 5% Significance Level**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.969
Shapiro Wilk Critical Value	0.887

Data appear Lognormal at 5% Significance Level**Assuming Normal Distribution**

95% Student's-t UCL	32.2
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95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	32.34
95% Modified-t UCL	32.27

Assuming Lognormal Distribution

95% H-UCL	35.17
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95% Chebyshev (MVUE) UCL	41.79
97.5% Chebyshev (MVUE) UCL	48.25
99% Chebyshev (MVUE) UCL	60.94

Gamma Distribution Test

k star (bias corrected)	3.91
Theta Star	6.835
nu star	125.1
Approximate Chi Square Value (.05)	100.3
Adjusted Level of Significance	0.0335
Adjusted Chi Square Value	97.75

Anderson-Darling Test Statistic	0.16
Anderson-Darling 5% Critical Value	0.741
Kolmogorov-Smirnov Test Statistic	0.0806
Kolmogorov-Smirnov 5% Critical Value	0.216

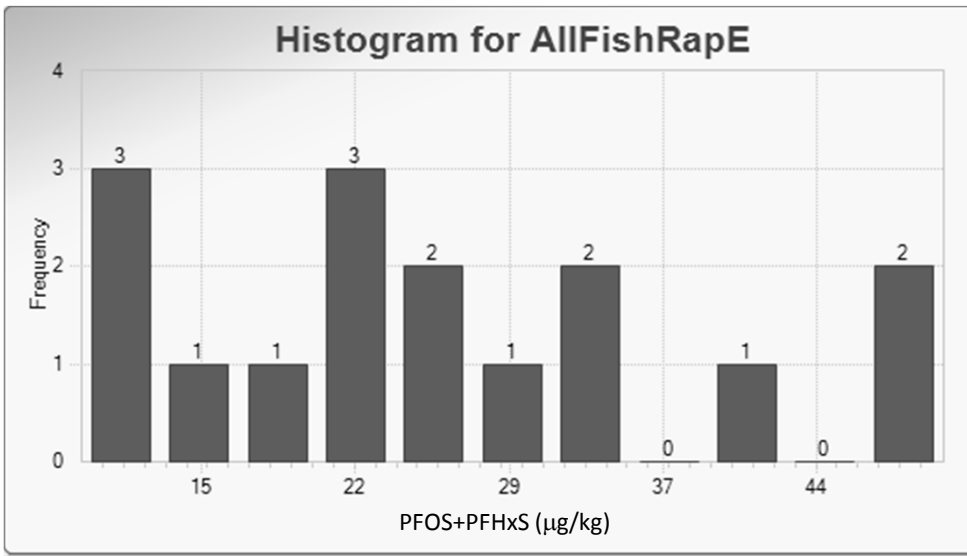
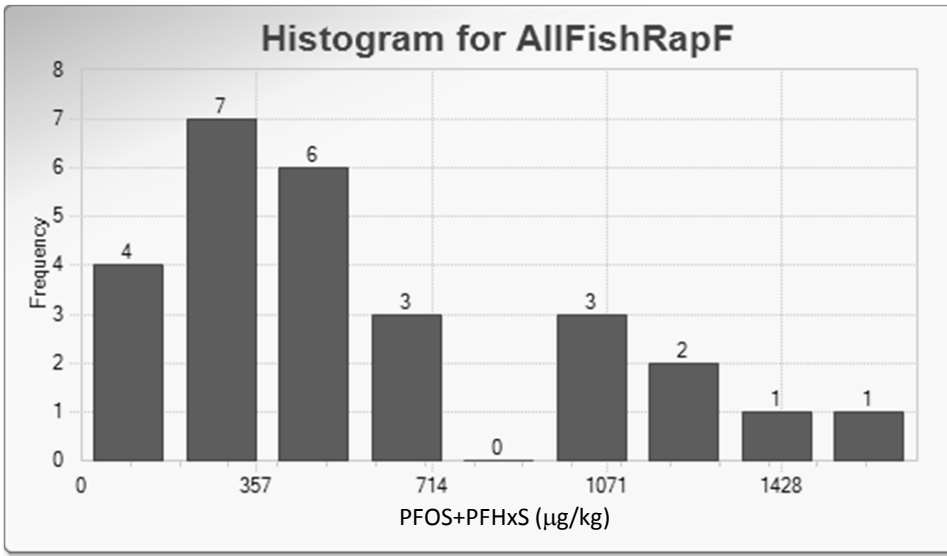
Data appear Gamma Distributed at 5% Significance Level**Assuming Gamma Distribution**

95% Approximate Gamma UCL	33.34
95% Adjusted Gamma UCL	34.21

Potential UCL to Use**Data Distribution****Data appear Normal at 5% Significance Level****Nonparametric Statistics**

95% CLT UCL	31.86
95% Jackknife UCL	32.2
95% Standard Bootstrap UCL	31.66
95% Bootstrap-t UCL	32.63
95% Hall's Bootstrap UCL	32.05
95% Percentile Bootstrap UCL	31.81
95% BCA Bootstrap UCL	32.12
95% Chebyshev(Mean, Sd) UCL	40.33
97.5% Chebyshev(Mean, Sd) UCL	46.22
99% Chebyshev(Mean, Sd) UCL	57.79

Use 95% Student's-t UCL	32.2
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General Statistics

Number of Valid Data	39	Number of Detected Data	37
Number of Distinct Detected Data	35	Number of Non-Detect Data	2
		Percent Non-Detects	5.13%

Raw Statistics

Minimum Detected	0.9
Maximum Detected	240
Mean of Detected	46.66
SD of Detected	52.79
Minimum Non-Detect	0.3
Maximum Non-Detect	0.3

Log-transformed Statistics

Minimum Detected	-0.105
Maximum Detected	5.481
Mean of Detected	3.114
SD of Detected	1.4
Minimum Non-Detect	-1.204
Maximum Non-Detect	-1.204

Background Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.794
5% Shapiro Wilk Critical Value	0.936

Data not Normal at 5% Significance Level

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.959
5% Shapiro Wilk Critical Value	0.936

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	44.28
SD	52.42
95% UTL 90% Coverage	133.2
95% UPL (t)	133.8
90% Percentile (z)	111.5
95% Percentile (z)	130.5
99% Percentile (z)	166.2
Maximum Likelihood Estimate(MLE) Method	
Mean	42.71
SD	53.8
95% UTL with 90% Coverage	134
95% UPL (t)	134.6
90% Percentile (z)	111.7
95% Percentile (z)	131.2
99% Percentile (z)	167.9

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean (Log Scale)	2.857
SD (Log Scale)	1.764
95% UTL 90% Coverage	346.7
95% UPL (t)	353.8
90% Percentile (z)	166.9
95% Percentile (z)	316.8
99% Percentile (z)	1054
Log ROS Method	
Mean in Original Scale	44.31
SD in Original Scale	52.39
95% UTL with 90% Coverage	264.7
95% BCA UTL with 90% Coverage	161.2
95% Bootstrap (%) UTL with 90% Coverage	126
95% UPL (t)	269.4
90% Percentile (z)	139
95% Percentile (z)	244.5
99% Percentile (z)	704.9

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	0.765
Theta Star	61.03
nu star	56.58

Data Distribution Test with Detected Values Only

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic	0.285
5% A-D Critical Value	0.785
K-S Test Statistic	0.0849
5% K-S Critical Value	0.15

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics with extrapolated Data

Mean	44.27
Median	30.7
SD	52.43
k star	0.343
Theta star	128.9
Nu star	26.79
95% Percentile of Chisquare (2k)	3.006
90% Percentile	128.2
95% Percentile	193.7
99% Percentile	361.3

Nonparametric Statistics

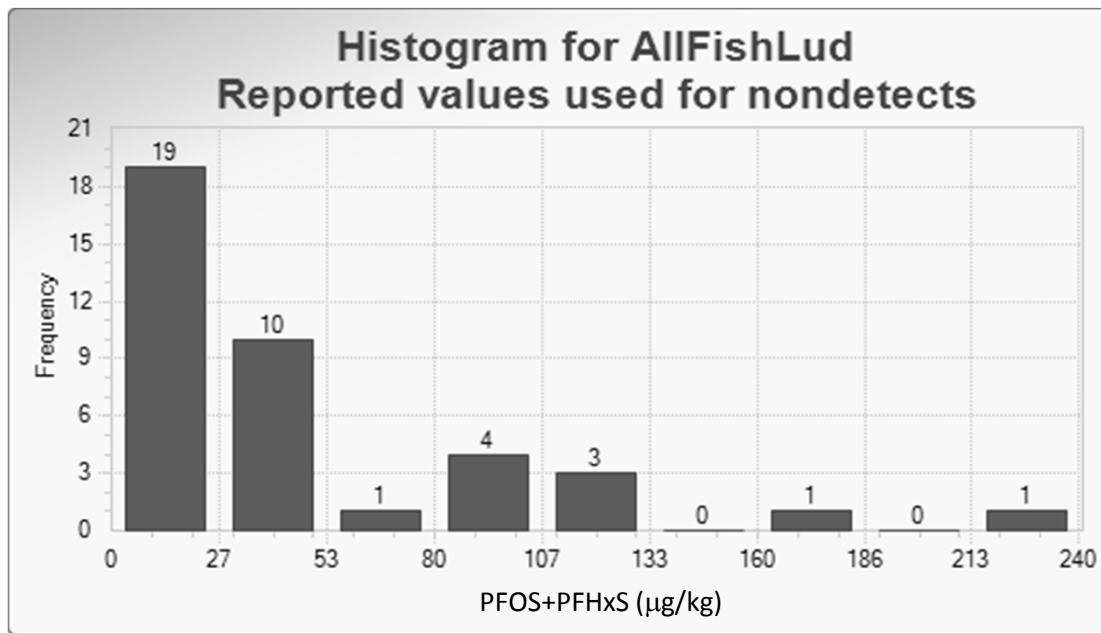
Kaplan-Meier (KM) Method

Mean	44.31
SD	51.71
SE of Mean	8.395
95% KM UTL with 90% Coverage	132
95% KM Chebyshev UPL	272.6
95% KM UPL (t)	132.6
90% Percentile (z)	110.6
95% Percentile (z)	129.4
99% Percentile (z)	164.6

Note: UPL (or upper percentile for gamma distributed data) represents a preferred estimate of BTV

For an Example: KM-UPL may be used when multiple detection limits are present

Note: DL/2 is not a recommended method.



General UCL Statistics for Data Sets with Non-Detects

AllFishLud

General Statistics

Number of Valid Data	39	Number of Detected Data	37
Number of Distinct Detected Data	35	Number of Non-Detect Data	2
		Percent Non-Detects	5.13%

Raw Statistics

Minimum Detected	0.9
Maximum Detected	240
Mean of Detected	46.66
SD of Detected	52.79
Minimum Non-Detect	0.3
Maximum Non-Detect	0.3

Log-transformed Statistics

Minimum Detected	-0.105
Maximum Detected	5.481
Mean of Detected	3.114
SD of Detected	1.4
Minimum Non-Detect	-1.204
Maximum Non-Detect	-1.204

UCL Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.794
5% Shapiro Wilk Critical Value	0.936

Data not Normal at 5% Significance Level

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.959
5% Shapiro Wilk Critical Value	0.936

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	44.28
SD	52.42
95% DL/2 (t) UCL	58.43

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	2.857
SD	1.764
95% H-Stat (DL/2) UCL	164.8

Maximum Likelihood Estimate(MLE) Method

Mean	42.71
SD	53.8
95% MLE (t) UCL	57.24
95% MLE (Tiku) UCL	56.38

Log ROS Method

Mean in Log Scale	2.943
SD in Log Scale	1.554
Mean in Original Scale	44.31
SD in Original Scale	52.39
95% Percentile Bootstrap UCL	58.34
95% BCA Bootstrap UCL	62.05

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	0.765
Theta Star	61.03
nu star	56.58

Data Distribution Test with Detected Values Only

Data appear Gamma Distributed at 5% Significance Level

A-D Test Statistic	0.285
5% A-D Critical Value	0.785
K-S Test Statistic	0.785
5% K-S Critical Value	0.15

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data	
Minimum	1.0000E-9
Maximum	240
Mean	44.27
Median	30.7
SD	52.43
k star	0.343
Theta star	128.9
Nu star	26.79
AppChi2	15.99
95% Gamma Approximate UCL	74.17
95% Adjusted Gamma UCL	75.74

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	44.31
SD	51.71
SE of Mean	8.395
95% KM (t) UCL	58.47
95% KM (z) UCL	58.12
95% KM (jackknife) UCL	58.43
95% KM (bootstrap t) UCL	62.56
95% KM (BCA) UCL	59.12
95% KM (Percentile Bootstrap) UCL	59.14
95% KM (Chebyshev) UCL	80.91
97.5% KM (Chebyshev) UCL	96.74
99% KM (Chebyshev) UCL	127.8

Potential UCLs to Use

95% KM (Chebyshev) UCL	80.91
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Note: DL/2 is not a recommended method.

General Statistics

Number of Valid Data	72	Number of Detected Data	51
Number of Distinct Detected Data	23	Number of Non-Detect Data	21
Number of Missing Values	2	Percent Non-Detects	29.17%

Raw Statistics

Minimum Detected	0.3
Maximum Detected	6.2
Mean of Detected	1.478
SD of Detected	1.143
Minimum Non-Detect	0.3
Maximum Non-Detect	0.3

Log-transformed Statistics

Minimum Detected	-1.204
Maximum Detected	1.825
Mean of Detected	0.173
SD of Detected	0.645
Minimum Non-Detect	-1.204
Maximum Non-Detect	-1.204

Background Statistics

Normal Distribution Test with Detected Values Only

Lilliefors Test Statistic	0.168
5% Lilliefors Critical Value	0.124

Data not Normal at 5% Significance Level

Lognormal Distribution Test with Detected Values Only

Lilliefors Test Statistic	0.123
5% Lilliefors Critical Value	0.124

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	1.091
SD	1.136
95% UTL 90% Coverage	2.877
95% UPL (t)	2.997
90% Percentile (z)	2.546
95% Percentile (z)	2.959
99% Percentile (z)	3.733
Maximum Likelihood Estimate(MLE) Method	
Mean	0.857
SD	1.419
95% UTL with 90% Coverage	3.088
95% UPL (t)	3.238
90% Percentile (z)	2.675
95% Percentile (z)	3.191
99% Percentile (z)	4.157

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean (Log Scale)	-0.43
SD (Log Scale)	1.092
95% UTL 90% Coverage	3.618
95% UPL (t)	4.06
90% Percentile (z)	2.634
95% Percentile (z)	3.915
99% Percentile (z)	8.238
Log ROS Method	
Mean in Original Scale	1.128
SD in Original Scale	1.107
95% UTL with 90% Coverage	3.209
95% BCA UTL with 90% Coverage	2.5
95% Bootstrap (%) UTL with 90% Coverage	2.6
95% UPL (t)	3.534
90% Percentile (z)	2.458
95% Percentile (z)	3.428
99% Percentile (z)	6.399

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	2.321
Theta Star	0.637
nu star	236.8

A-D Test Statistic	0.907
5% A-D Critical Value	0.76
K-S Test Statistic	0.134
5% K-S Critical Value	0.126

Data not Gamma Distributed at 5% Significance Level

Data Distribution Test with Detected Values Only

Data appear Lognormal at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics with extrapolated Data

Mean	1.238
Median	0.946
SD	1.06
k star	0.553
Theta star	2.237
Nu star	79.66
95% Percentile of Chisquare (2k)	4.099
90% Percentile	3.277
95% Percentile	4.586
99% Percentile	7.773

Nonparametric Statistics

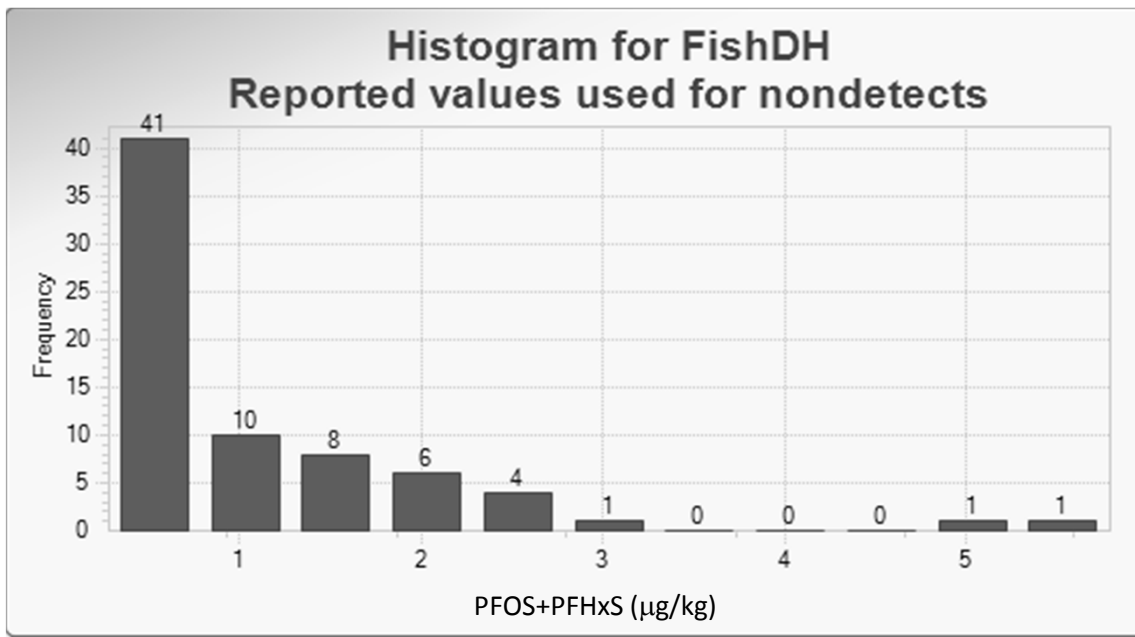
Kaplan-Meier (KM) Method

Mean	1.135
SD	1.093
SE of Mean	0.13
95% KM UTL with 90% Coverage	2.853
95% KM Chebyshev UPL	5.931
95% KM UPL (t)	2.968
90% Percentile (z)	2.535
95% Percentile (z)	2.932
99% Percentile (z)	3.677

Note: UPL (or upper percentile for gamma distributed data) represents a preferred estimate of BTV

For an Example: KM-UPL may be used when multiple detection limits are present

Note: DL/2 is not a recommended method.



General Statistics

Number of Valid Data	72	Number of Detected Data	51
Number of Distinct Detected Data	23	Number of Non-Detect Data	21
Number of Missing Values	2	Percent Non-Detects	29.17%

Raw Statistics

Minimum Detected	0.3
Maximum Detected	6.2
Mean of Detected	1.478
SD of Detected	1.143
Minimum Non-Detect	0.3
Maximum Non-Detect	0.3

Log-transformed Statistics

Minimum Detected	-1.204
Maximum Detected	1.825
Mean of Detected	0.173
SD of Detected	0.645
Minimum Non-Detect	-1.204
Maximum Non-Detect	-1.204

UCL Statistics**Normal Distribution Test with Detected Values Only**

Lilliefors Test Statistic	0.168
5% Lilliefors Critical Value	0.124

Data not Normal at 5% Significance Level**Lognormal Distribution Test with Detected Values Only**

Lilliefors Test Statistic	0.123
5% Lilliefors Critical Value	0.124

Data appear Lognormal at 5% Significance Level**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	1.091
SD	1.136
95% DL/2 (t) UCL	1.314

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	-0.43
SD	1.092
95% H-Stat (DL/2) UCL	1.108

Maximum Likelihood Estimate(MLE) Method

Mean	0.857
SD	1.419
95% MLE (t) UCL	1.136
95% MLE (Tiku) UCL	1.149

Log ROS Method

Mean in Log Scale	-0.274
SD in Log Scale	0.916
Mean in Original Scale	1.128
SD in Original Scale	1.107
95% Percentile Bootstrap UCL	1.357
95% BCA Bootstrap UCL	1.369

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	2.321
Theta Star	0.637
nu star	236.8

Data Distribution Test with Detected Values Only**Data appear Lognormal at 5% Significance Level**

A-D Test Statistic	0.907
5% A-D Critical Value	0.76
K-S Test Statistic	0.76
5% K-S Critical Value	0.126

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	1.135
SD	1.093
SE of Mean	0.13
95% KM (t) UCL	1.351
95% KM (z) UCL	1.349
95% KM (jackknife) UCL	1.331
95% KM (bootstrap t) UCL	1.389
95% KM (BCA) UCL	1.422
95% KM (Percentile Bootstrap) UCL	1.372
95% KM (Chebyshev) UCL	1.702
97.5% KM (Chebyshev) UCL	1.947
99% KM (Chebyshev) UCL	2.429

Data not Gamma Distributed at 5% Significance Level**Assuming Gamma Distribution****Gamma ROS Statistics using Extrapolated Data**

Minimum	1.0000E-9
Maximum	6.2
Mean	1.238
Median	0.946
SD	1.06
k star	0.553
Theta star	2.237
Nu star	79.66
AppChi2	60.1
95% Gamma Approximate UCL	1.641
95% Adjusted Gamma UCL	1.65

Potential UCLs to Use

95% KM (BCA) UCL	1.422
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Note: DL/2 is not a recommended method.

Crustaceans Ludmilla

General Statistics

Total Number of Observations	28	Number of Distinct Observations	27
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Raw Statistics

Minimum	0.8
Maximum	49.11
Second Largest	41.15
First Quartile	3.175
Median	7.15
Third Quartile	17.65
Mean	12.61
SD	13.62
Coefficient of Variation	1.08
Skewness	1.482

Log-Transformed Statistics

Minimum	-0.223
Maximum	3.894
Second Largest	3.717
First Quartile	1.154
Median	1.967
Third Quartile	2.868
Mean	1.961
SD	1.145

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.786
Shapiro Wilk Critical Value	0.924

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.924

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage	37.11
95% UPL (t)	36.21
90% Percentile (z)	30.06
95% Percentile (z)	35.01
99% Percentile (z)	44.29

Assuming Lognormal Distribution

95% UTL with 90% Coverage	55.72
95% UPL (t)	51.69
90% Percentile (z)	30.81
95% Percentile (z)	46.7
99% Percentile (z)	101.9

Gamma Distribution Test

k star	0.922
Theta Star	13.68
nu star	51.63

A-D Test Statistic	0.485
5% A-D Critical Value	0.774
K-S Test Statistic	0.128
5% K-S Critical Value	0.17

Data appear Gamma Distributed at 5% Significance Level

Data Distribution Test

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Statistics

90% Percentile	41.1
95% Percentile	45.53
99% Percentile	49.11

Assuming Gamma Distribution

90% Percentile	29.62
95% Percentile	38.88
99% Percentile	60.51

95% UTL with 90% Coverage	41.15
95% Percentile Bootstrap UTL with 90% Coverage	42.74
95% BCA Bootstrap UTL with 90% Coverage	42.74
95% UPL	45.53
95% Chebyshev UPL	73.01
Upper Threshold Limit Based upon IQR	39.36

Note: UPL (or upper percentile for gamma distributed data) represents a preferred estimate of BTV

General Statistics

Number of Valid Observations	28	Number of Distinct Observations	27
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Raw Statistics

Minimum	0.8
Maximum	49.11
Mean	12.61
Median	7.15
SD	13.62
Coefficient of Variation	1.08
Skewness	1.482

Log-transformed Statistics

Minimum of Log Data	-0.223
Maximum of Log Data	3.894
Mean of log Data	1.961
SD of log Data	1.145

Relevant UCL Statistics**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.786
Shapiro Wilk Critical Value	0.924

Data not Normal at 5% Significance Level**Assuming Normal Distribution**

95% Student's-t UCL	16.99
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95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	17.61
95% Modified-t UCL	17.11

Gamma Distribution Test

k star (bias corrected)	0.922
Theta Star	13.68
nu star	51.63
Approximate Chi Square Value (.05)	36.13
Adjusted Level of Significance	0.0404
Adjusted Chi Square Value	35.32
Anderson-Darling Test Statistic	0.485
Anderson-Darling 5% Critical Value	0.774
Kolmogorov-Smirnov Test Statistic	0.128
Kolmogorov-Smirnov 5% Critical Value	0.17

Data appear Gamma Distributed at 5% Significance Level**Assuming Gamma Distribution**

95% Approximate Gamma UCL	18.02
95% Adjusted Gamma UCL	18.43

Potential UCL to Use**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.924

Data appear Lognormal at 5% Significance Level**Assuming Lognormal Distribution**

95% H-UCL	24.47
95% Chebyshev (MVUE) UCL	27.83
97.5% Chebyshev (MVUE) UCL	34.17
99% Chebyshev (MVUE) UCL	46.61

Data Distribution**Data appear Gamma Distributed at 5% Significance Level****Nonparametric Statistics**

95% CLT UCL	16.84
95% Jackknife UCL	16.99
95% Standard Bootstrap UCL	16.74
95% Bootstrap-t UCL	18.45
95% Hall's Bootstrap UCL	17.34
95% Percentile Bootstrap UCL	17.02
95% BCA Bootstrap UCL	17.59
95% Chebyshev(Mean, Sd) UCL	23.83
97.5% Chebyshev(Mean, Sd) UCL	28.68
99% Chebyshev(Mean, Sd) UCL	38.21

Use 95% Approximate Gamma UCL 18.02

General Statistics			
Total Number of Observations	7	Number of Distinct Observations	7
Raw Statistics		Log-Transformed Statistics	
Minimum	6	Minimum	1.792
Maximum	142	Maximum	4.956
Second Largest	79	Second Largest	4.369
First Quartile	22.37	First Quartile	3.108
Median	27	Median	3.296
Third Quartile	79	Third Quartile	4.369
Mean	47.05	Mean	3.439
SD	47.58	SD	1.006
Coefficient of Variation	1.011		
Skewness	1.687		

Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 7 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.771	Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical Value	0.803	Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	178.1	95% UTL with 90% Coverage	497.6
95% UPL (t)	145.9	95% UPL (t)	251.7
90% Percentile (z)	108	90% Percentile (z)	113
95% Percentile (z)	125.3	95% Percentile (z)	162.9
99% Percentile (z)	157.7	99% Percentile (z)	323.3
Gamma Distribution Test		Data Distribution Test	
k star	0.869	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	54.12		
nu star	12.17		
A-D Test Statistic	0.497	Nonparametric Statistics	
5% A-D Critical Value	0.723	90% Percentile	142
K-S Test Statistic	0.316	95% Percentile	142
5% K-S Critical Value	0.318	99% Percentile	142
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	142
90% Percentile	112.1	95% Percentile Bootstrap UTL with 90% Coverage	142
95% Percentile	148.2	95% BCA Bootstrap UTL with 90% Coverage	142
99% Percentile	232.7	95% UPL	142
		95% Chebyshev UPL	268.8
		Upper Threshold Limit Based upon IQR	163.9

Note: UPL (or upper percentile for gamma distributed data) represents a preferred estimate of BTV

General Statistics

Number of Valid Observations	7	Number of Distinct Observations	7
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Raw Statistics

Minimum	6
Maximum	142
Mean	47.05
Median	27
SD	47.58
Coefficient of Variation	1.011
Skewness	1.687

Log-transformed Statistics

Minimum of Log Data	1.792
Maximum of Log Data	4.956
Mean of log Data	3.439
SD of log Data	1.006

Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 7 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.771
Shapiro Wilk Critical Value	0.803

Data not Normal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	82
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95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	88.88
95% Modified-t UCL	83.91

Gamma Distribution Test

k star (bias corrected)	0.869
Theta Star	54.12
nu star	12.17
Approximate Chi Square Value (.05)	5.34
Adjusted Level of Significance	0.0158
Adjusted Chi Square Value	4.057

Anderson-Darling Test Statistic	0.497
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Anderson-Darling 5% Critical Value	0.723
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Kolmogorov-Smirnov Test Statistic	0.316
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Kolmogorov-Smirnov 5% Critical Value	0.318
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Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	107.2
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95% Adjusted Gamma UCL	141.1
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Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical Value	0.803

Data appear Lognormal at 5% Significance Level

Assuming Lognormal Distribution

95% H-UCL	237.4
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95% Chebyshev (MVUE) UCL	125.3
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97.5% Chebyshev (MVUE) UCL	159.2
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99% Chebyshev (MVUE) UCL	225.7
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Data Distribution

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Statistics

95% CLT UCL	76.63
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95% Jackknife UCL	82
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95% Standard Bootstrap UCL	74.23
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95% Bootstrap-t UCL	188.3
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95% Hall's Bootstrap UCL	331.3
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95% Percentile Bootstrap UCL	74.71
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95% BCA Bootstrap UCL	82.91
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95% Chebyshev(Mean, Sd) UCL	125.4
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97.5% Chebyshev(Mean, Sd) UCL	159.4
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99% Chebyshev(Mean, Sd) UCL	226
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General Background Statistics for Full Data Sets

Crustaceans Rapid Creek Estuary

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Number of Missing Values	1		

Raw Statistics

Minimum	3.14
Maximum	44.1
Second Largest	34.8
First Quartile	7.725
Median	10.35
Third Quartile	31.75
Mean	16.72
SD	12.68
Coefficient of Variation	0.758
Skewness	0.915

Log-Transformed Statistics

Minimum	1.144
Maximum	3.786
Second Largest	3.55
First Quartile	2.044
Median	2.337
Third Quartile	3.458
Mean	2.542
SD	0.77

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.823
Shapiro Wilk Critical Value	0.905

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% UTL with 90% Coverage	41.15
95% UPL (t)	39.2
90% Percentile (z)	32.98
95% Percentile (z)	37.59
99% Percentile (z)	46.23

Assuming Lognormal Distribution

95% UTL with 90% Coverage	56
95% UPL (t)	49.73
90% Percentile (z)	34.09
95% Percentile (z)	45.09
99% Percentile (z)	76.22

Gamma Distribution Test

k star	1.706
Theta Star	9.801
nu star	68.25

A-D Test Statistic	0.899
5% A-D Critical Value	0.753
K-S Test Statistic	0.194
5% K-S Critical Value	0.196

Data follow Appx. Gamma Distribution at 5% Significance Level

Data Distribution Test

Data Follow Appr. Gamma Distribution at 5% Significance Level

Nonparametric Statistics

90% Percentile	34.7
95% Percentile	43.64
99% Percentile	44.1

Assuming Gamma Distribution

90% Percentile	33.78
95% Percentile	41.75
99% Percentile	59.59

95% UTL with 90% Coverage 44.1

95% Percentile Bootstrap UTL with 90% Coverage 44.1

95% BCA Bootstrap UTL with 90% Coverage 34.8

95% UPL 43.64

95% Chebyshev UPL 73.38

Upper Threshold Limit Based upon IQR 67.79

Note: UPL (or upper percentile for gamma distributed data) represents a preferred estimate of BTV

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	20
Number of Missing Values	1		

Raw Statistics

Minimum	3.14
Maximum	44.1
Mean	16.72
Median	10.35
SD	12.68
Coefficient of Variation	0.758
Skewness	0.915

Log-transformed Statistics

Minimum of Log Data	1.144
Maximum of Log Data	3.786
Mean of log Data	2.542
SD of log Data	0.77

Relevant UCL Statistics**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.823
Shapiro Wilk Critical Value	0.905

Data not Normal at 5% Significance Level**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.905

Data appear Lognormal at 5% Significance Level**Assuming Normal Distribution**

95% Student's-t UCL	21.63
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95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	22.01
95% Modified-t UCL	21.72

Assuming Lognormal Distribution

95% H-UCL	25.6
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95% Chebyshev (MVUE) UCL	30.36
97.5% Chebyshev (MVUE) UCL	36.24
99% Chebyshev (MVUE) UCL	47.79

Gamma Distribution Test

k star (bias corrected)	1.706
Theta Star	9.801
nu star	68.25
Approximate Chi Square Value (.05)	50.24
Adjusted Level of Significance	0.038
Adjusted Chi Square Value	49.01

Anderson-Darling Test Statistic	0.899
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Anderson-Darling 5% Critical Value	0.753
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Kolmogorov-Smirnov Test Statistic	0.194
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Kolmogorov-Smirnov 5% Critical Value	0.196
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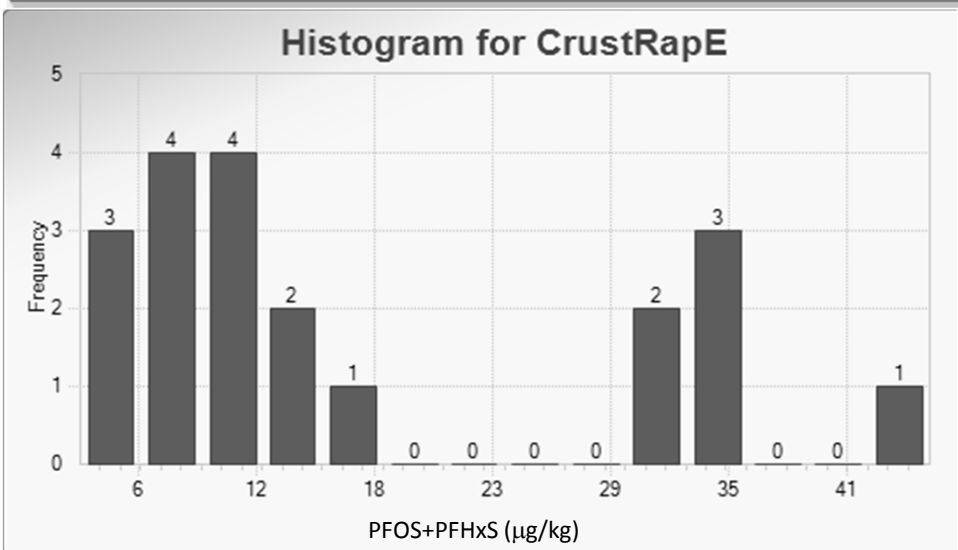
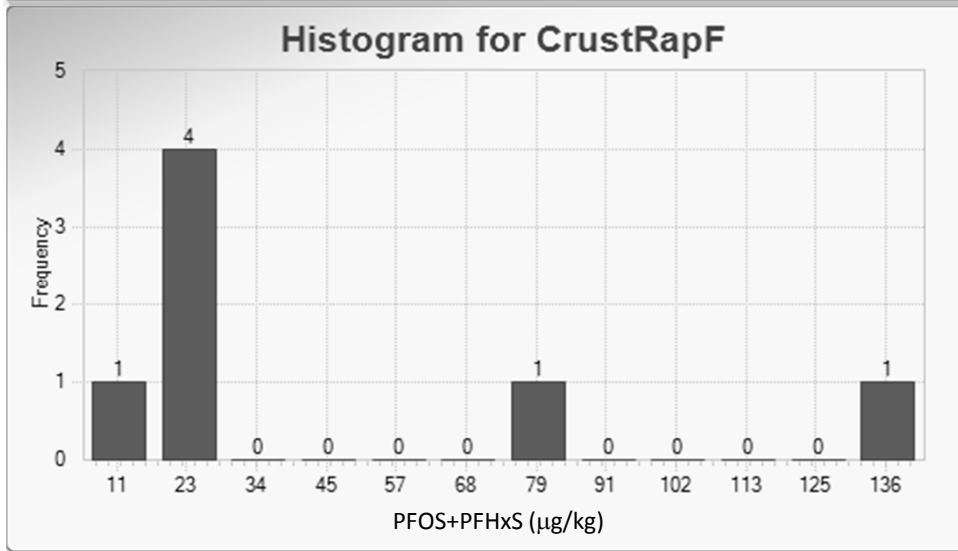
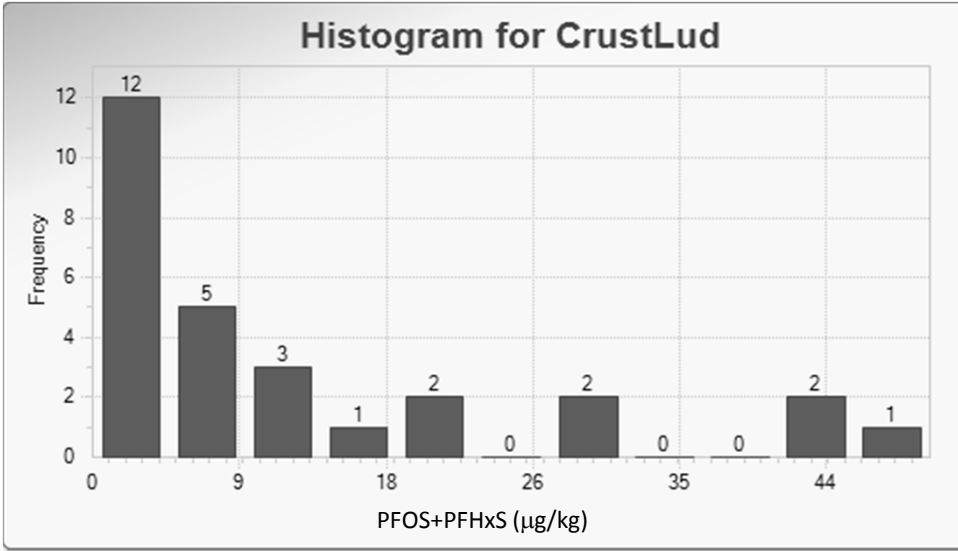
Data follow Appr. Gamma Distribution at 5% Significance Level**Assuming Gamma Distribution**

95% Approximate Gamma UCL	22.72
95% Adjusted Gamma UCL	23.29

Potential UCL to Use**Data Distribution****Data Follow Appr. Gamma Distribution at 5% Significance Level****Nonparametric Statistics**

95% CLT UCL	21.39
95% Jackknife UCL	21.63
95% Standard Bootstrap UCL	21.29
95% Bootstrap-t UCL	22.57
95% Hall's Bootstrap UCL	21.44
95% Percentile Bootstrap UCL	21.41
95% BCA Bootstrap UCL	22.02
95% Chebyshev(Mean, Sd) UCL	29.09
97.5% Chebyshev(Mean, Sd) UCL	34.44
99% Chebyshev(Mean, Sd) UCL	44.94

Use 95% Approximate Gamma UCL 22.72



General Statistics

Number of Valid Data	15	Number of Detected Data	10
Number of Distinct Detected Data	8	Number of Non-Detect Data	5
		Percent Non-Detects	33.33%

Raw Statistics

Minimum Detected	0.4
Maximum Detected	3.3
Mean of Detected	1.08
SD of Detected	0.897
Minimum Non-Detect	0.3
Maximum Non-Detect	0.3

Log-transformed Statistics

Minimum Detected	-0.916
Maximum Detected	1.194
Mean of Detected	-0.154
SD of Detected	0.675
Minimum Non-Detect	-1.204
Maximum Non-Detect	-1.204

Background Statistics**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.748
5% Shapiro Wilk Critical Value	0.842

Data not Normal at 5% Significance Level**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.924
5% Shapiro Wilk Critical Value	0.842

Data appear Lognormal at 5% Significance Level**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	0.77
SD	0.85
95% UTL 90% Coverage	2.528
95% UPL (t)	2.317
90% Percentile (z)	1.86
95% Percentile (z)	2.168
99% Percentile (z)	2.748

Maximum Likelihood Estimate(MLE) Method

Mean	0.568
SD	1.06
95% UTL with 90% Coverage	2.76
95% UPL (t)	2.496
90% Percentile (z)	1.926
95% Percentile (z)	2.311
99% Percentile (z)	3.033

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	1.69
Theta Star	0.639
nu star	33.79

A-D Test Statistic	0.521
5% A-D Critical Value	0.734
K-S Test Statistic	0.218
5% K-S Critical Value	0.269

Data appear Gamma Distributed at 5% Significance Level**Assuming Lognormal Distribution**

DL/2 Substitution Method	
Mean (Log Scale)	-0.735
SD (Log Scale)	1.008
95% UTL 90% Coverage	3.857
95% UPL (t)	3.001
90% Percentile (z)	1.746
95% Percentile (z)	2.518
99% Percentile (z)	5.005

Log ROS Method

Mean in Original Scale	0.774
SD in Original Scale	0.848
95% UTL with 90% Coverage	4.093
95% BCA UTL with 90% Coverage	3.3
95% Bootstrap (%) UTL with 90% Coverage	3.3
95% UPL (t)	3.161
90% Percentile (z)	1.81
95% Percentile (z)	2.639
99% Percentile (z)	5.35

Data Distribution Test with Detected Values Only**Data appear Gamma Distributed at 5% Significance Level**

Assuming Gamma Distribution

Gamma ROS Statistics with extrapolated Data

Mean	0.884
Median	0.738
SD	0.799
k star	0.387
Theta star	2.282
Nu star	11.62
95% Percentile of Chisquare (2k)	3.255
90% Percentile	2.511
95% Percentile	3.714
99% Percentile	6.748

Nonparametric Statistics

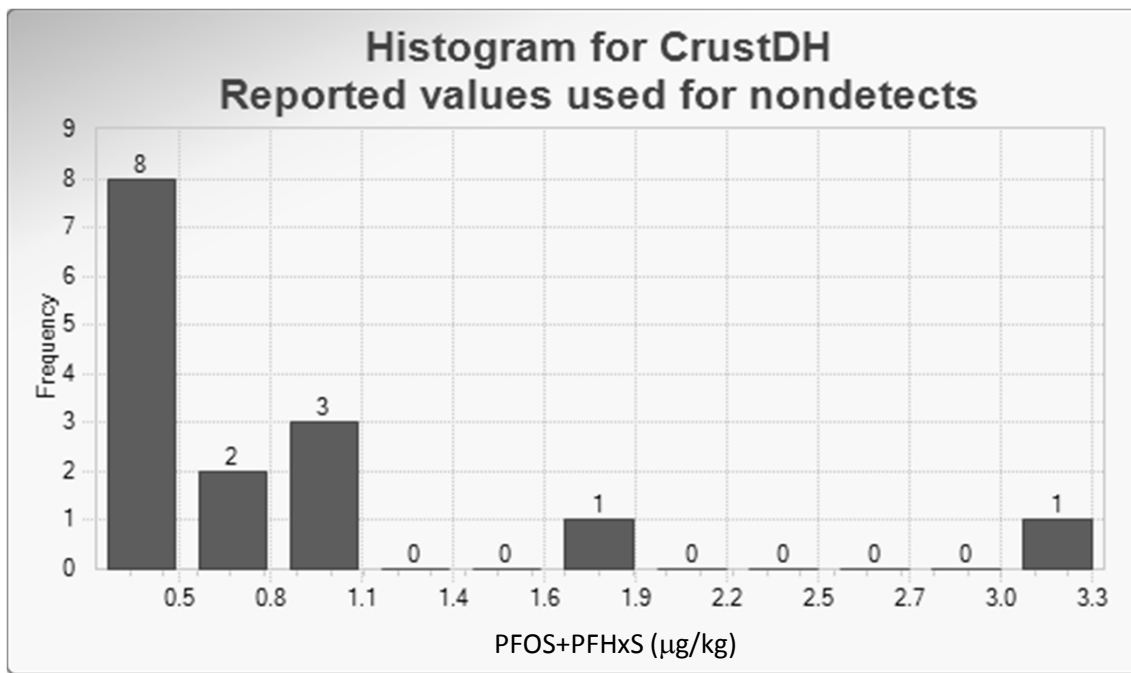
Kaplan-Meier (KM) Method

Mean	0.853
SD	0.765
SE of Mean	0.208
95% KM UTL with 90% Coverage	2.435
95% KM Chebyshev UPL	4.297
95% KM UPL (t)	2.245
90% Percentile (z)	1.834
95% Percentile (z)	2.112
99% Percentile (z)	2.633

Note: UPL (or upper percentile for gamma distributed data) represents a preferred estimate of BTV

For an Example: KM-UPL may be used when multiple detection limits are present

Note: DL/2 is not a recommended method.



General Statistics

Number of Valid Data	15	Number of Detected Data	10
Number of Distinct Detected Data	8	Number of Non-Detect Data	5
		Percent Non-Detects	33.33%

Raw Statistics

Minimum Detected	0.4
Maximum Detected	3.3
Mean of Detected	1.08
SD of Detected	0.897
Minimum Non-Detect	0.3
Maximum Non-Detect	0.3

Log-transformed Statistics

Minimum Detected	-0.916
Maximum Detected	1.194
Mean of Detected	-0.154
SD of Detected	0.675
Minimum Non-Detect	-1.204
Maximum Non-Detect	-1.204

UCL Statistics**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.748
5% Shapiro Wilk Critical Value	0.842

Data not Normal at 5% Significance Level**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.924
5% Shapiro Wilk Critical Value	0.842

Data appear Lognormal at 5% Significance Level**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	0.77
SD	0.85
95% DL/2 (t) UCL	1.157

Maximum Likelihood Estimate(MLE) Method

Mean	0.568
SD	1.06
95% MLE (t) UCL	1.05
95% MLE (Tiku) UCL	1.084

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	-0.735
SD	1.008
95% H-Stat (DL/2) UCL	0.974

Log ROS Method

Mean in Log Scale	-0.736
SD in Log Scale	1.037
Mean in Original Scale	0.774
SD in Original Scale	0.848
95% Percentile Bootstrap UCL	1.16
95% BCA Bootstrap UCL	1.275

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	1.69
Theta Star	0.639
nu star	33.79

A-D Test Statistic	0.521
5% A-D Critical Value	0.734
K-S Test Statistic	0.734
5% K-S Critical Value	0.269

Data appear Gamma Distributed at 5% Significance Level**Assuming Gamma Distribution****Gamma ROS Statistics using Extrapolated Data**

Minimum	1.0000E-9
Maximum	3.3
Mean	0.884
Median	0.738
SD	0.799
k star	0.387
Theta star	2.282
Nu star	11.62
AppChi2	4.98
95% Gamma Approximate UCL	2.063
95% Adjusted Gamma UCL	2.306

Data Distribution Test with Detected Values Only**Data appear Gamma Distributed at 5% Significance Level****Nonparametric Statistics**

Kaplan-Meier (KM) Method	
Mean	0.853
SD	0.765
SE of Mean	0.208
95% KM (t) UCL	1.22
95% KM (z) UCL	1.196
95% KM (jackknife) UCL	1.213
95% KM (bootstrap t) UCL	1.843
95% KM (BCA) UCL	1.287
95% KM (Percentile Bootstrap) UCL	1.233
95% KM (Chebyshev) UCL	1.761
97.5% KM (Chebyshev) UCL	2.154
99% KM (Chebyshev) UCL	2.925

Potential UCLs to Use

95% KM (Percentile Bootstrap) UCL	1.233
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Note: DL/2 is not a recommended method.

General Statistics

Number of Valid Data	16	Number of Detected Data	15
Number of Distinct Detected Data	14	Number of Non-Detect Data	1
		Percent Non-Detects	6.25%

Raw Statistics

Minimum Detected	1.15
Maximum Detected	31.8
Mean of Detected	11.29
SD of Detected	10.23
Minimum Non-Detect	0.5
Maximum Non-Detect	0.5

Log-transformed Statistics

Minimum Detected	0.14
Maximum Detected	3.459
Mean of Detected	1.915
SD of Detected	1.12
Minimum Non-Detect	-0.693
Maximum Non-Detect	-0.693

Background Statistics**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.851
5% Shapiro Wilk Critical Value	0.881

Data not Normal at 5% Significance Level**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.902
5% Shapiro Wilk Critical Value	0.881

Data appear Lognormal at 5% Significance Level**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	10.6
SD	10.26
95% UTL 90% Coverage	31.45
95% UPL (t)	29.13
90% Percentile (z)	23.74
95% Percentile (z)	27.47
99% Percentile (z)	34.46

Maximum Likelihood Estimate(MLE) Method

Mean	10.26
SD	10.42
95% UTL with 90% Coverage	31.45
95% UPL (t)	29.1
90% Percentile (z)	23.62
95% Percentile (z)	27.41
99% Percentile (z)	34.51

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	0.94
Theta Star	12.01
nu star	28.2

A-D Test Statistic	0.763
5% A-D Critical Value	0.761
K-S Test Statistic	0.21
5% K-S Critical Value	0.227

Data follow Appx. Gamma Distribution at 5% Significance Level**Assuming Lognormal Distribution**

DL/2 Substitution Method	
Mean (Log Scale)	1.708
SD (Log Scale)	1.361
95% UTL 90% Coverage	87.85
95% UPL (t)	64.59
90% Percentile (z)	31.59
95% Percentile (z)	51.79
99% Percentile (z)	131

Log ROS Method

Mean in Original Scale	10.61
SD in Original Scale	10.24
95% UTL with 90% Coverage	76.57
95% BCA UTL with 90% Coverage	26.94
95% Bootstrap (%) UTL with 90% Coverage	31.8
95% UPL (t)	57.4
90% Percentile (z)	29.37
95% Percentile (z)	46.68
99% Percentile (z)	111.3

Data Distribution Test with Detected Values Only

Data follow Appr. Gamma Distribution at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics with extrapolated Data

Mean	10.58
Median	4.45
SD	10.27
k star	0.334
Theta star	31.67
Nu star	10.69
95% Percentile of Chisquare (2k)	2.951
90% Percentile	30.77
95% Percentile	46.74
99% Percentile	87.7

Nonparametric Statistics

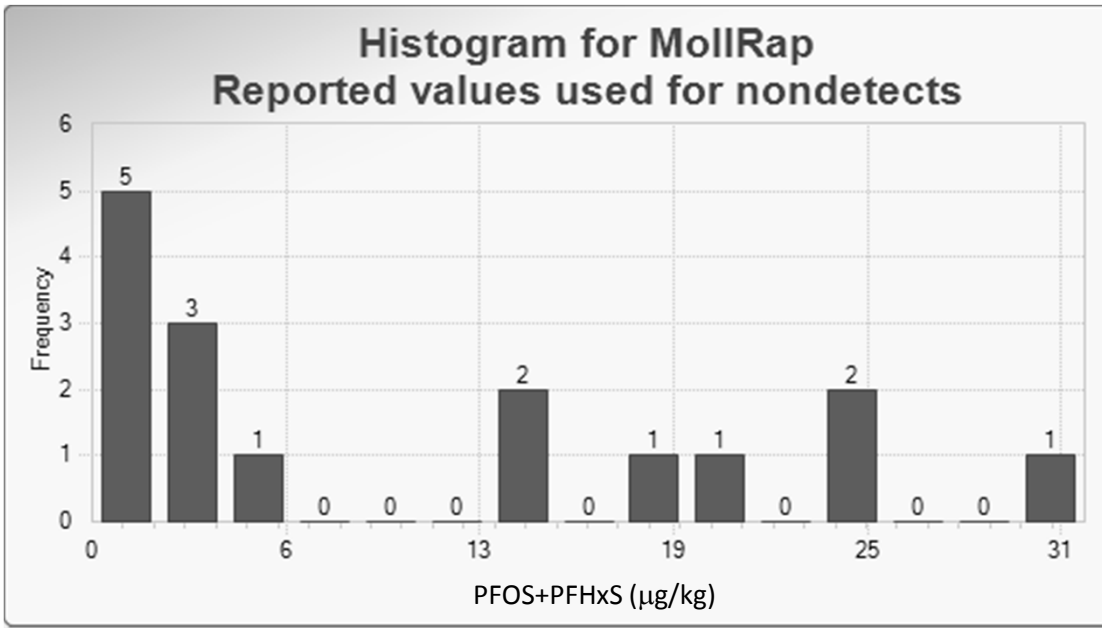
Kaplan-Meier (KM) Method

Mean	10.66
SD	9.875
SE of Mean	2.555
95% KM UTL with 90% Coverage	30.73
95% KM Chebyshev UPL	55.02
95% KM UPL (t)	28.5
90% Percentile (z)	23.31
95% Percentile (z)	26.9
99% Percentile (z)	33.63

Note: UPL (or upper percentile for gamma distributed data) represents a preferred estimate of BTV

For an Example: KM-UPL may be used when multiple detection limits are present

Note: DL/2 is not a recommended method.



General Statistics

Number of Valid Data	16	Number of Detected Data	15
Number of Distinct Detected Data	14	Number of Non-Detect Data	1
		Percent Non-Detects	6.25%

Raw Statistics

Minimum Detected	1.15
Maximum Detected	31.8
Mean of Detected	11.29
SD of Detected	10.23
Minimum Non-Detect	0.5
Maximum Non-Detect	0.5

Log-transformed Statistics

Minimum Detected	0.14
Maximum Detected	3.459
Mean of Detected	1.915
SD of Detected	1.12
Minimum Non-Detect	-0.693
Maximum Non-Detect	-0.693

UCL Statistics**Normal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.851
5% Shapiro Wilk Critical Value	0.881

Data not Normal at 5% Significance Level**Lognormal Distribution Test with Detected Values Only**

Shapiro Wilk Test Statistic	0.902
5% Shapiro Wilk Critical Value	0.881

Data appear Lognormal at 5% Significance Level**Assuming Normal Distribution**

DL/2 Substitution Method	
Mean	10.6
SD	10.26
95% DL/2 (t) UCL	15.09

Maximum Likelihood Estimate(MLE) Method

Mean	10.26
SD	10.42
95% MLE (t) UCL	14.83
95% MLE (Tiku) UCL	14.65

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	1.708
SD	1.361
95% H-Stat (DL/2) UCL	39.22

Log ROS Method

Mean in Log Scale	1.746
SD in Log Scale	1.275
Mean in Original Scale	10.61
SD in Original Scale	10.24
95% Percentile Bootstrap UCL	14.9
95% BCA Bootstrap UCL	15.07

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	0.94
Theta Star	12.01
nu star	28.2

A-D Test Statistic	0.763
5% A-D Critical Value	0.761
K-S Test Statistic	0.761
5% K-S Critical Value	0.227

Data follow Appr. Gamma Distribution at 5% Significance Level**Assuming Gamma Distribution****Gamma ROS Statistics using Extrapolated Data**

Minimum	1.0000E-9
Maximum	31.8
Mean	10.58
Median	4.45
SD	10.27
k star	0.334
Theta star	31.67
Nu star	10.69
AppChi2	4.379
95% Gamma Approximate UCL	25.84
95% Adjusted Gamma UCL	28.8

Data Distribution Test with Detected Values Only**Data Follow Appr. Gamma Distribution at 5% Significance Level****Nonparametric Statistics**

Kaplan-Meier (KM) Method	
Mean	10.66
SD	9.875
SE of Mean	2.555
95% KM (t) UCL	15.13
95% KM (z) UCL	14.86
95% KM (jackknife) UCL	15.1
95% KM (bootstrap t) UCL	15.84
95% KM (BCA) UCL	15.01
95% KM (Percentile Bootstrap) UCL	14.8
95% KM (Chebyshev) UCL	21.79
97.5% KM (Chebyshev) UCL	26.61
99% KM (Chebyshev) UCL	36.08

Potential UCLs to Use

95% KM (Chebyshev) UCL	21.79
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Note: DL/2 is not a recommended method.

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	34
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Raw Statistics

Minimum	0.08
Maximum	118
Mean	23.32
Median	4.85
SD	39.73
Coefficient of Variation	1.704
Skewness	1.779

Log-transformed Statistics

Minimum of Log Data	-2.526
Maximum of Log Data	4.771
Mean of log Data	1.385
SD of log Data	2.166

Relevant UCL Statistics**Normal Distribution Test**

Shapiro Wilk Test Statistic	0.597
Shapiro Wilk Critical Value	0.936

Data not Normal at 5% Significance Level**Assuming Normal Distribution**

95% Student's-t UCL	34.35
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95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	36.1
95% Modified-t UCL	34.66

Gamma Distribution Test

k star (bias corrected)	0.364
Theta Star	64.05
nu star	26.94
Approximate Chi Square Value (.05)	16.11
Adjusted Level of Significance	0.0431
Adjusted Chi Square Value	15.74

Anderson-Darling Test Statistic	1.407
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Anderson-Darling 5% Critical Value	0.84
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Kolmogorov-Smirnov Test Statistic	0.152
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Kolmogorov-Smirnov 5% Critical Value	0.156
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Data follow Appr. Gamma Distribution at 5% Significance Level**Assuming Gamma Distribution**

95% Approximate Gamma UCL	39.01
95% Adjusted Gamma UCL	39.91

Potential UCL to Use**Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.936

Data appear Lognormal at 5% Significance Level**Assuming Lognormal Distribution**

95% H-UCL	173
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95% Chebyshev (MVUE) UCL	111.2
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97.5% Chebyshev (MVUE) UCL	144.3
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99% Chebyshev (MVUE) UCL	209.2
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Data Distribution**Data Follow Appr. Gamma Distribution at 5% Significance Level****Nonparametric Statistics**

95% CLT UCL	34.06
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95% Jackknife UCL	34.35
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95% Standard Bootstrap UCL	33.94
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95% Bootstrap-t UCL	37.01
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95% Hall's Bootstrap UCL	34.27
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95% Percentile Bootstrap UCL	34.99
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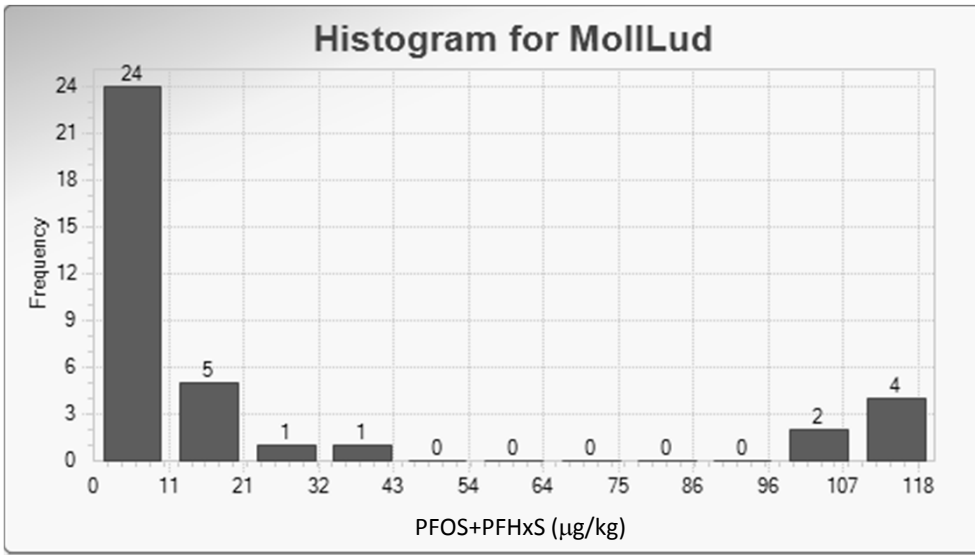
95% BCA Bootstrap UCL	36.31
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95% Chebyshev(Mean, Sd) UCL	51.79
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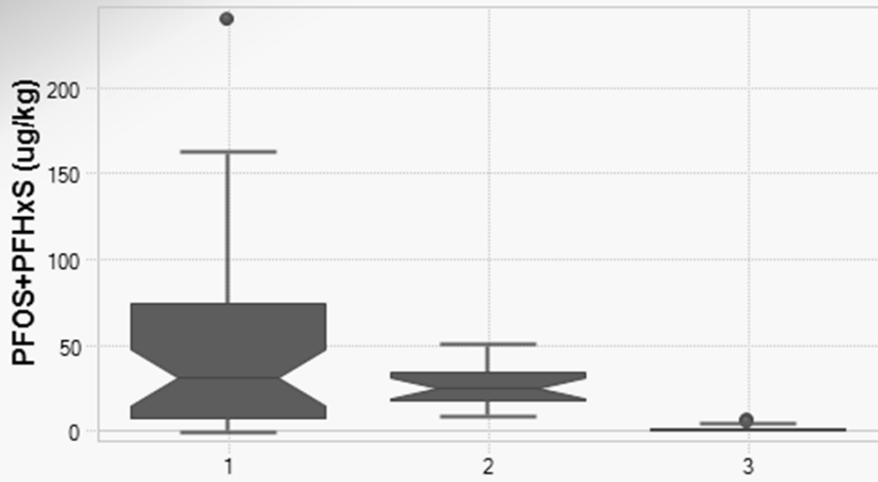
97.5% Chebyshev(Mean, Sd) UCL	64.11
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99% Chebyshev(Mean, Sd) UCL	88.31
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Use 95% Adjusted Gamma UCL	39.91
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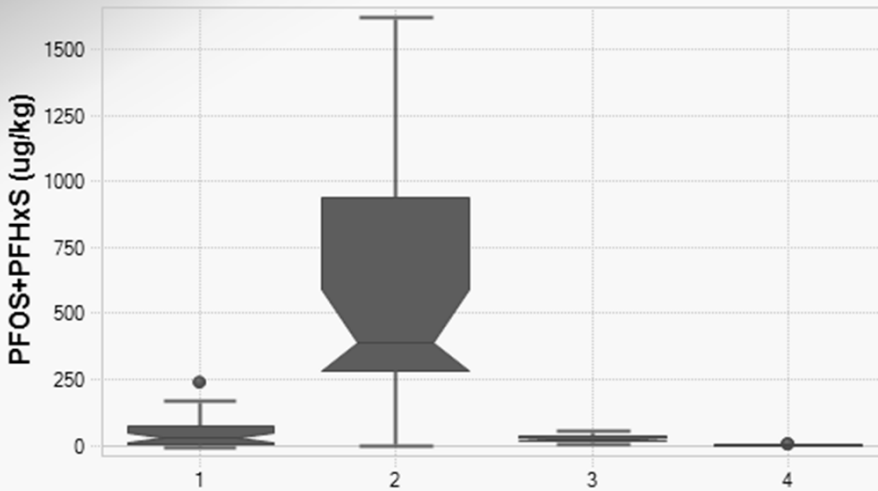


Estuarine and Marine Fish

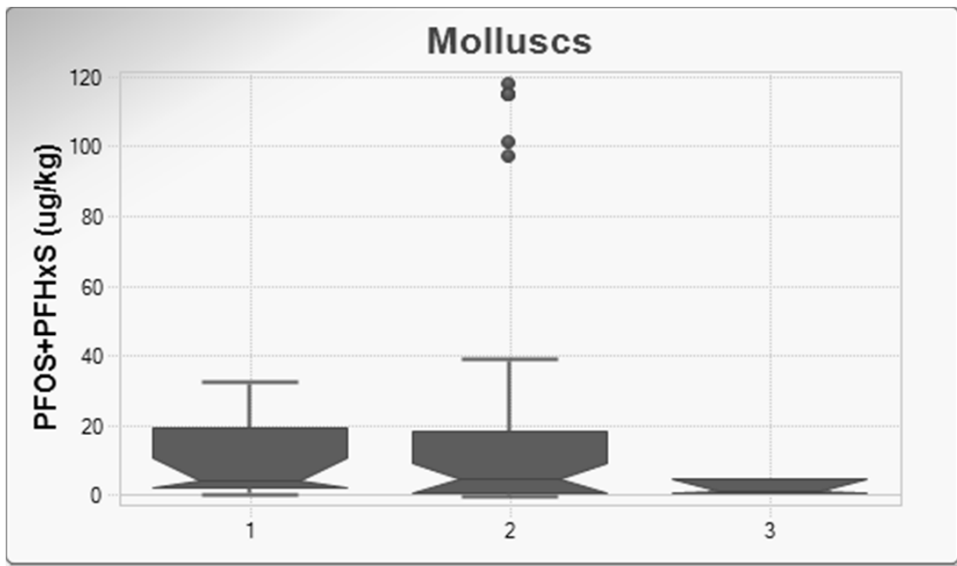


- 1 - Rapid Creek Fish - Estuarine
- 2 - Ludmilla Creek Fish
- 3 - Darwin Harbour Fish

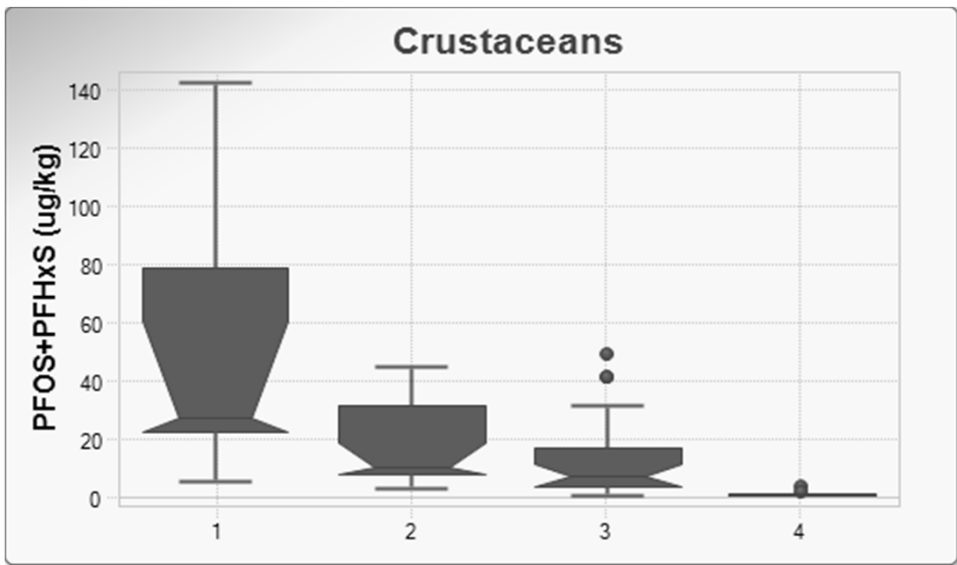
All Fish



- 1 - Rapid Creek Fish - Estuarine
- 2 - Rapid Creek Fish - Freshwater
- 3 - Ludmilla Creek Fish
- 4 - Darwin Harbour Fish



- 1 - Rapid Creek Molluscs - Estuarine
- 2 - Ludmilla Creek Molluscs
- 3 - Darwin Harbour/Sadgroves Creek Molluscs



- 1 - Rapid Creek Redclaw - Freshwater
- 2 - Rapid Creek Crabs - Estuarine
- 3 - Ludmilla Creek Crabs & Prawns
- 4 - Darwin Harbour Crabs