Coordinated Assessments Data Exchange Standards

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StreamNet Project

for

Pacific Northwest Coordinated Assessments Data Exchange Standards Development Team

List of "indicators" described in this document

This document contains data structures for sharing information about several "high level indicators" (HLIs). You can use the table below to find which data table in the document contains the indicator of interest to you.

Indicator	Rearing Type	Description	Table
Spawner abundance	Natural origin	Number of natural origin fish that actually spawn, not necessarily the number of fish returning to a spawning area.	NOSA (A1)
Escapement	Natural origin	Number of natural origin fish that return to a specific spot(s) on their migration to spawn.	NOSA (A1)
Presmolt abundance	Natural origin	Number of natural origin juvenile fish in a population. Usually late summer parr, but may be any time and stage.	PresmoltAbundance (A6)
Number of outmigrants	Natural origin	Number of fish passing a defined point as they migrate downstream.	JuvenileOutmigrants (A4)
Smolt to adult return rate (percentage)	Natural origin	100 X the point estimate of the number of returning natural origin adults, divided by the point estimate of the number of smolts that produced those returning adults.	SAR (A2)
Recruits per spawner: adults	Natural origin	Recruit per spawner ratios are specific to the locations and seasons described in each record of data. The number of "recruits" can be defined at any life stage.	RperS (A3)
Recruits per spawner: juveniles	Natural origin		
Proportionate natural influence (PNI) of integrated natural / hatchery populations	Combination of natural origin and hatchery origin	Estimate of the relative selection pressure of the natural environment in an integrated natural / hatchery population.	PNI (B2)

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I. Introduction

This document data exchange standards for the Coordinated Assessments high level indicators. It includes 1) the names and purposes of tables, 2) relationships among tables, and 3) the names, purposes, and properties of fields within tables. These data exchange standards were created by Pacific Northwest United States representatives from state and federal and tribal fisheries management and regulatory agencies, private consultants, and federal funding agencies. These standards become effective no earlier than two months after the approval date.

These standards describe in detail the data items (fields), data types, and coding conventions for the various tables containing data submitted to the regional database by participating agencies and tribes. The standards apply to data submitted on or after the effective date shown on the title page of this document; adoption of the standards generally does not dictate resubmittal of data already in the regional database in order to bring existing data into the new standard. These exchange standards do not necessarily represent the final data structure of the data in the regional system, nor do they represent a comprehensive data dictionary for all data contained in the system. Rather, they provide a standardized data structure for sharing data at a regional level.

This document has three main divisions: this introduction; the descriptions of the data tables; and appendices. Sections within the data tables division describe tables that have a common theme: the first section contains the tables for indicators meant to characterize the status of naturally-spawning fish populations; the second section contains the tables meant to characterize the success of hatchery programs and the status of hatchery populations.

The tables in this document represent data tables in a computer file. The tables in this document are comprised of 4 columns:
- Field Name
- Field Description
- Data Type
- Codes/Conventions

Field Name is the name of the field in the data table. Underlined field names indicate primary key designations; multiple underlined field names indicate a multi-field key. Tables sometimes have key(s) in addition to the primary key; the additional key(s) are called "alternate keys". The word "unique" in parentheses under a field name indicates a single-field (primary or alternate) key – each value in that field must be unique within the table. When one or more multi-field alternate keys exist they are noted in the table's introductory paragraph.

Field Description is a brief definition or description of the field. The definitions/descriptions are the most important part of the tables in this document.

Data Type specifies the type of data/information. The number next to a "Text" designation indicates the maximum number of characters allowed in that field, with "∞" indicating essentially no length limit. Appendix F contains details regarding these data types.

Codes/Conventions provides lookup codes, business rules, or other information applicable to the field. Due to lack of space, not all lookup codes are listed in this document. The full lists are available upon request, as is the most recent draft of the next DES version. The DES revision procedure document is available at https://www.streamnet.org/resources/exchange-tools/des/.

Required fields are indicated by **bold red font** in the *Field Name* and *Data Type* columns. If the *Field Name* and *Data Type* are ***bold and red and italicized***, then whether the field is required varies according to entries in other fields of the record – refer to the *red italicized text in the Field Description column* for business rules on when the field is required.

II. Data Tables

Section A: Indicators for Populations of Natural Origin Fishes

In all tables, "natural origin" fish are those resulting from spawning in the natural environment, while "hatchery origin" fish are those resulting from spawning in a hatchery. Whether the parents were natural origin, hatchery origin, or a mix does not matter.

A1. NOSA Table
This table stores information concerning natural origin spawner abundance (NOSA) and natural origin escapement. NOSA refers to the number of live natural origin fish available to participate in natural spawning during the spawning period Escapement refers to the

Data are normally submitted to the StreamNet database via a program that interacts with the StreamNet API. New partners may initially send files in Microsoft Access, SQL Server, or Excel format.

For help understanding the data tables or this document, or if you would like to use a non-API data submission process, contact Mike Banach with Pacific States Marine Fisheries Commission (503-595-3152; Mike_Banach@psmfc.org).

number of natural origin fish returning to spawn that pass upstream of a specified location during a specified time period.

Field Name	Field Description	Data Type	
			Fields for defining a
ID (unique)	Value used by computer to identify a record.	***GUID***	This value is a glob... • When submitting... the central syster... must be incorpor... • When updating c...
TimeSeriesID	This field identifies the time series a record belongs to. Records with the same TimeSeriesID are grouped and presented together on the CAX query systems. Assigned by data compilers or regional data assemblers as appropriate.	**Integer**	TimeSeriesID is use... tables in the CA ha... the Trend table of th... "TrendID"). The sa... than one of these ta... For records in this t... • All PopID value... • The SpawningY... Although not enfor... will usually have: • The same PopFi... • The same Estim... • The same Water... If ownership of a ti... organizations, the T...
CommonName	Common name of the taxon of fish.	**Text 50**	Select from the foll...

Field Name	Field Description	Data Type	Field Name	Field Description	Data Type	
Run	Run of fish.	**Text 20**	Enter the name of the run here, even if run name is included in the name of the population. Entries in this field are not recognized as taxonomic divisions. Select from the following: *[Do not include comments in brackets.]* — WaterBody: Enter the name of the body of water associated with the time series. • Spring • Summer • Fall • Late fall • Winter • Spring/summer	• For NOSA estimates (when EstimateType = "NOSA"), the name of the body of water associated with the time series. • For escapement estimates (when EstimateType = "Escapement") the specific location of the estimate, which may include weirs, fish ladders, PIT tag — BothEstimateType & winter • Early • Late • Both early & late *(N/A for species without recognized runs. For example, bull trout.)*	**Text 255**	For NOSA estimates • the name of a flu • the name of an i • the name of a len For a description of r • the name of a dan
RecoveryDomain	Name of the "recovery domain," as defined by the NMFS Northwest Region, in which the population falls geographically.	Text 255	Five recovery domains have been defined by NMFS in Washington, Oregon, and Idaho. Select the appropriate one from this list. • Puget Sound • Willamette/Lower Columbia • Interior Columbia • Oregon Coast • Southern Oregon/Northern California Coast	detectors, sonar installations, or other sites. Escapement is the number of fish passing upstream of this location. **EscapementLong** — For escapement estimates, longitude of the location specified in the WaterBody field in decimal degrees (not in degrees-minutes-seconds). Should be in NAD83/WGS84 datum.	Further information about recovery domains can be found at https://web.archive.org/web/20161215214935/http://www.nwfsc.noaa.gov/trt/. — **Real**	For escapement esti fish ladder on the W This is a negative n example, if WaterB
ESU_DPS	For populations listed under the federal ESA, this is the name of a defined Evolutionarily Significant Unit (ESU) or Distinct Population Segment (DPS) as defined by NMFS Northwest Region or by USFWS. For non-listed populations this is the DPS or other name.	Text 255	Enter the name of the ESU or DPS here. Entries in this field are not recognized as taxonomic divisions including at the species, subspecies, or finer scale. ESUs/DPSs defined by NMFS or USFWS, and may wish to pro https://web.archive.org/web/20161215214935/ in California are listed at http://www.nwfsc.noaa.gov/trt/.	[In such cases the system, and the Wa		Required if Estimat
MajorPopGroup	Name of "major population group" (MPG) or "stratum" as defined by the NMFS Northwest Region, in which the population falls.	Text 255	The term "stratum" is used in the Willamette/Lower Columbia recovery domain, while "major population group" is used in the Interior Columbia recovery domain. Both represent aggregations of areas. The term "stratum" includes life history considerations as well as geographic criteria; single MPGs are defined geographically. **EscapementLat** — For escapement estimates, latitude of the location specified in the WaterBody field in decimal degrees. Should be in NAD83/WGS84 datum.	— **Real**	Use two digits left Redmond-Sheppherd R Required if Estimat
PopID	Code for the population(s) of fish represented by this record.	**Integer**	See Appendix C if you need a code for a population not already in the list. **SpawningCode** — Then four-digit population code which represents in this list of the year (or run where appropriate) began.	Then four-digit population code which represents this species (and run where appropriate) began.	**Integer**	In cases where an u (after December 31 this species/run in c populations do not b
CommonPopName	Population name used by local biologists.	Text 255	Often this is simply the name of the population(s) as written on the original time series spreadsheets.			other populations th
PopFit	Categorization of how well the geographic extent of the NOSA/escapement estimate corresponds to the geographic definition of the population.	**Text 8**	This value must be "Multiple" if PopID represents a superpopulation. Acceptable values: *[Do not include comments in brackets.]* • Same *[Estimate represents one entire population, the whole population, and nothing but the population.]* • Portion *[Estimate represents a portion of one population. (Describe in PopFitNotes field.)]* • Multiple *[Estimate is from more than one population. (Describe in PopFitNotes field.)]* — **EscapementTiming**: Specific time period for an escapement estimate, in terms of months of the year. May be the start and end months of sampling, or the first and last months of fish observations.		**Text 7**	31. Use 3-character mo • Mar-Jun • Nov-Feb Required if Estimat
PopFitNotes	Text description of how well the NOSA/escapement value corresponds to the defined population, and why the data are not at the scale of a single population.	*Text ∞*	This field is required if the PopFit field is "Portion" or "Multiple". If the PopFit field is "Portion" or "Multiple", describe the lack of correspondence between the defined population and which the NOSA/escapement estimate was made. Also state why this scale of data was used to represent the population. — **ContactAgency**: Agency, tribe, or other entity, or person responsible for these data that is the best contact for questions that true population-scale data. (Examples: "Data at this scale best represents the population.") may arise about this data record.		**Text 255**	Entries in this field agency list. Here a represent instead of here, contact your a StreamNet staff at 5
EstimateType	Whether the values in the NOSAIJ / NOSAEJ fields are classified as spawner abundance or escapement. See the NOSA/Escapement Decision Tree (Appendix D) for guidance in determining NOSA vs. escapement.	**Text 10**	Acceptable values: *[Do not include comments in brackets.]* • NOSA *[The number of live natural origin fish available to participate in natural spawning during the spawning period.]* • Escapement *[The number of natural origin fish returning to spawn that pass upstream of a specified location during a specified time period. Includes fish harvested / pre-spawn mortalities that occurred after passing the specified location.)]* If "Escapement" is chosen then the EscapementLong, EscapementLat, and EscapementTiming fields are required. If "NOSA" is chosen then those fields must be null.			• Columbia River • Confederated Tri • Confederated Tri • Confederated Tri • Confederated Tri

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
MethodNumber	This field represents the method(s) used to calculate the values in the "Indicators" and "Metrics" sections. / This field is used in conjunction with the ContactAgency field. See the Codes/Conventions column for details.	**Integer**	This field, along with the "ContactAgency" field, identifies which (combination of) methods were used to calculate them. These allow for multiple entries for the same population and year. Thus, it is possible to share values that are based on different assumptions.	**NOSAEJ** "ContactAgency" field	The upper identifies which confidence level the value in the *record* and which (minimum value = 0 ... values in the record. NOSAEJ field		
				NOSAEJAlpha	The significance level for the NOSAEJ confidence interval, expressed as alpha.	Real	Express these values ...
				NOBroodStockRemoved	When EstimateType = "NOSA", this field is the number of natural origin fish (adults plus jacks) that were prevented from participating in natural spawning because they were taken for use as hatchery broodstock. / When EstimateType = "Escapement", this field is the number of natural origin fish (adults plus jacks) that were prevented from passing upstream of the site specified in the WaterBody and location fields because they were taken for use as hatchery broodstock.	Integer	Provide whole numbers ... broodstock were taken. / The value in this field ... / **NOSA example:** EstimateType = "NO... NOSAIJ = 450 indi... NOBroodStockRem... Therefore the total ...
BestValue	A declaration of whether the ContactAgency considers this record to be their approved best estimate for this combination of PopID, PopFit, and SpawningYear. / When a ContactAgency provides >1 record for that combination then "Yes" in this BestValue field indicates this record contains the indicator value the agency recognizes as their best estimate.	**Text 13**	Acceptable values: [*Do not include comments in brackets*] • Yes [*The entity (tribe, state agency, etc.) that created this record recognizes it as their approved best estimate.*] • No [*Not recognized as the best estimate provided by that entity.*] • Not specified Notes regarding the combination of fields specified in the "Field Description": 1. When only one record exists for the combination, BestValue generally should be "Yes". 2. It is acceptable for all alternatives to have "No" / "Yes" / "Not specified" in the BestValue field. 3. Different contact agencies can each specify "Yes" for the same combination.				
Indicators							**Escapement exam...** EstimateType = "Es... NOSAIJ = 450 indi... NOBroodStockRem... Details should be e... Therefore the total ... location is 450.
NOSAIJ	The point estimate for NOSA or natural origin escapement, including jacks. / See the EstimateType field for definitions of NOSA and escapement. / Includes "adults" and jacks, all of natural origin. "Natural origin" means the fish's parents spawned in the wild.	*Integer*	Provide whole numbers only, not decimal values. / This field is required if the NOSAEJ field is null and NullRecord = "No". / For populations for which "jacks" are not recognized, enter the NOSA estimate in this field. The only species for which jacks are recognized are Chinook salmon, coho salmon, chum salmon (rarely), and winter steelhead (rarely). / The statistical approach ... ProtMethURL / ProtMethDocumentation fields				
Metrics supporting the "In... / Note: These "metrics" fields were not modified when escapement estimates were explicitly added to this ta...							
				pHOSij	Point estimate for the proportion of fish spawning naturally, including jacks, that are hatchery origin fish.	Real	Express these values ... For populations for ... recognized are Chin...
NOSAIJLowerLimit	The lower limit of the confidence interval for the NOSAIJ field.	*Integer*	Minimum value = 0. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).				
NOSAIJUpperLimit	The upper limit of the confidence interval for the NOSAIJ field.	*Integer*	Minimum value = 0	pHOSijLowerLimit	The lower limit of the confidence interval for the pHOSij field.	Real	Minimum value = 0 ... in this field, but we ... normal distribution...
NOSAIJAlpha	The significance level for the NOSAIJ confidence interval, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".	pHOSijUpperLimit	The upper limit of the confidence interval for the pHOSij field.	Real	Minimum value = 0 ... 1.0 in this field, but ...
NOSAEJ	The point estimate for NOSA or natural origin escapement, excluding jacks. / See the EstimateType field for definitions of NOSA and escapement. / Includes only "adults" of natural origin, excluding jacks. "Natural origin" means the fish's parents spawned in the wild.	*Integer*	Provide whole numbers only, not decimal values. / This field is required if the NOSAIJ field is null and NullRecord = "No". / For populations for which "jacks" are not recognized, leave this field blank. The only species for which jacks are recognized are Chinook salmon, coho salmon, chum salmon (rarely), and winter steelhead (rarely). / The statistical approach used to generate the estimate should be thoroughly explained in the methods referenced in the ProtMethURL / ProtMethDocumentation fields	pHOSijAlpha	The significance level for the pHOSij confidence interval, expressed as alpha.	Real	Express these values ...
				pHOSej	Point estimate for the proportion of fish spawning naturally, excluding jacks, that are hatchery origin fish.	Real	Express these value... For populations for ...
				pHOSejLowerLimit	The lower limit of the confidence interval for the pHOSej field.	Real	Minimum value = 0 ... in this field, but we ... normal distribution...
NOSAEJLowerLimit	The lower limit of the confidence interval for the NOSAEJ field.	*Integer*	Minimum value = 0. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).	pHOSejUpperLimit	The upper limit of the confidence interval for the pHOSej field.	Real	Minimum value = 0 ... 1.0 in this field, but ...

Field Name	Field Description	Data Type	
pHOSejAlpha	The significance level for the pHOSej confidence interval, expressed as alpha.	Real	Express these value
NOSJF	The point estimate for the natural origin spawners jack fraction.	Real	Proportion of natural origin spawners that are jacks. Express these values as numbers from zero to one, with three digits to the right of the decimal point.
NOSJFLowerLimit	The lower limit of the confidence interval for the NOSJF field.	Real	Minimum value = 0 and maximum = 1. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).
NOSJFUpperLimit	The upper limit of the confidence interval for the NOSJF field.	Real	Minimum value = 0 and maximum = 1. If the calculated lower limit of the confidence interval is more than 1.0 you may report 1.0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits.
NOSJFAlpha	The significance level for the NOSJF confidence interval, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".
HOSJF	The point estimate for the hatchery origin spawners jack fraction.	Real	Proportion of hatchery origin spawners that are jacks. Express these values as numbers from zero to one, with three digits to the right of the decimal point.
TSAIJ	The point estimate for total spawner abundance, including jacks.	Integer	Estimated total number of fish contributing to spawning in a particular year. Includes both natural origin and hatchery origin returns, and adult and jack age classes. Provide whole numbers only, not decimal values. For populations for which "jacks" are not recognized, enter the TSA estimate in this field. The only species for which jacks are recognized are Chinook salmon, coho salmon, chum salmon (rarely), and winter steelhead (rarely).
TSAIJLowerLimit	The lower limit of the confidence interval for the TSAIJ field.	Integer	Minimum value = 0. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).
TSAIJUpperLimit	The upper limit of the confidence interval for the TSAIJ field.	Integer	Minimum value = 0.
TSAIJAlpha	The significance level for the TSAIJ confidence interval, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".
TSAEJ	The point estimate for total spawner abundance, excluding jacks.	Integer	Estimated total number of fish contributing to spawning in a particular year. Includes both natural origin and hatchery origin returns, for adult age classes excluding jacks. Provide whole numbers only, not decimal values. For populations for which "jacks" are not recognized, leave this field blank.
TSAEJLowerLimit	The lower limit of the confidence interval for the TSAEJ field.	Integer	Minimum value = 0. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).
TSAEJUpperLimit	The upper limit of the confidence interval for the TSAEJ field.	Integer	Minimum value = 0.
TSAEJAlpha	The significance level for the TSAEJ confidence interval, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".

Field Name	Field Description	Data Type	
	Age distribution		
Age2Prop	The proportion of natural origin fish that were age 2 (brood year +2).	Real	Values must be between
Age2PropLowerLimit	The lower limit of the confidence interval for the Age2Prop field.	Real	
Age2PropUpperLimit	The upper limit of the confidence interval for the Age2Prop field.	Real	
Age3Prop	The proportion of natural origin fish that were age 3 (brood year +3).	Real	See the Codes/Con
Age3PropLowerLimit	The lower limit of the confidence interval for the Age3Prop field.	Real	See the Codes/Con
Age3PropUpperLimit	The upper limit of the confidence interval for the Age3Prop field.	Real	See the Codes/Con
Age4Prop	The proportion of natural origin fish that were age 4 (brood year +4).	Real	See the Codes/Con
Age4PropLowerLimit	The lower limit of the confidence interval for the Age4Prop field.	Real	
Age4PropUpperLimit	The upper limit of the confidence interval for the Age4Prop field.	Real	
Age5Prop	The proportion of natural origin fish that were age 5 (brood year +5).	Real	See the Codes/Con

Left-hand table:

Field Name	Field Description	Data Type	
Age5PropLowerLimit	The lower limit of the confidence interval for the Age5Prop field.	Real	See the Codes/Con...
Age5PropUpperLimit	The upper limit of the confidence interval for the Age5Prop field.	Real	See the Codes/Con...
Age6Prop	The proportion of natural origin fish that were age 6 (brood year +6).	Real	See the Codes/Conventions column for the Age2Prop field.
Age6PropLowerLimit	The lower limit of the confidence interval for the Age6Prop field.	Real	See the Codes/Conventions for the Age2PropLowerLimit field.
Age6PropUpperLimit	The upper limit of the confidence interval for the Age6Prop field.	Real	See the Codes/Conventions for the Age2PropUpperLimit field.
Age7Prop	The proportion of natural origin fish that were age 7 (brood year +7).	Real	See the Codes/Conventions column for the Age2Prop field.
Age7PropLowerLimit	The lower limit of the confidence interval for the Age7Prop field.	Real	See the Codes/Conventions for the Age2PropLowerLimit field.
Age7PropUpperLimit	The upper limit of the confidence interval for the Age7Prop field.	Real	See the Codes/Conventions for the Age2PropUpperLimit field.
Age8Prop	The proportion of natural origin fish that were age 8 (brood year +8).	Real	See the Codes/Conventions column for the Age2Prop field.
Age8PropLowerLimit	The lower limit of the confidence interval for the Age8Prop field.	Real	See the Codes/Conventions for the Age2PropLowerLimit field.
Age8PropUpperLimit	The upper limit of the confidence interval for the Age8Prop field.	Real	See the Codes/Conventions for the Age2PropUpperLimit field.
Age9Prop	The proportion of natural origin fish that were age 9 (brood year +9).	Real	See the Codes/Conventions column for the Age2Prop field.
Age9PropLowerLimit	The lower limit of the confidence interval for the Age9Prop field.	Real	See the Codes/Conventions for the Age2PropLowerLimit field.
Age9PropUpperLimit	The upper limit of the confidence interval for the Age9Prop field.	Real	See the Codes/Conventions for the Age2PropUpperLimit field.
Age10Prop	The proportion of natural origin fish that were age 10 (brood year +10).	Real	See the Codes/Conventions column for the Age2Prop field.
Age10PropLowerLimit	The lower limit of the confidence interval for the Age10Prop field.	Real	See the Codes/Conventions for the Age2PropLowerLimit field.
Age10PropUpperLimit	The upper limit of the confidence interval for the Age10Prop field.	Real	See the Codes/Conventions for the Age2PropUpperLimit field.
Age11PlusProp	The proportion of natural origin fish that were age 11 (brood year +11) or older.	Real	See the Codes/Con...
Age11PlusPropLowerLimit	The lower limit of the confidence interval for the Age11PlusProp field.	Real	See the Codes/Conventions for the Age2PropLowerLimit field.
Age11PlusPropUpperLimit	The upper limit of the confidence interval for the Age11PlusProp field.	Real	See the Codes/Conventions for the Age2PropUpperLimit field.
AgePropAlpha	The significance level for the Age_x_Prop confidence intervals, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".

Right-hand table (overlaid):

Field Name	Field Description	Data Type	
Protocol and method			
ProtMethName	Provide title of all protocols and associated data collection and data analysis methods used to calculate the indicator estimate.	Text ∞	Provide title of prot... Documentation sho... implementation not... description of field...
ProtMethURL	URL(s) for published protocols and methods describing the methodology and documenting the derivation of the indicator. If published in MonitoringResources.org, this link will provide access to study design information and all methods associated with the protocol.	*Text ∞*	Required if ProtMe... Provide URL(s) to s... documentation shou... online methods doc... If methodology is u... provide a new link.
ProtMethDocumentation	Citation or documentation that describes the protocol and/or method(s) listed in the ProtMethName field. Include references not documented in MonitoringResources.org, such as reports, journal articles or other publications that describe the survey design, field methodology and analytical approach used to derive the indicator estimate.	*Text ∞*	Required if ProtMe... Provide a citation(s... publications that de... step by step proced... published, either in... blank if methodolo... Note: If there is no... Library (cbfwl.org)... If methodology is u... new link or referen...
MethodAdjustments	Minor adjustments to a method in a given year that are not described in the method citations above but are important.	Text ∞	Give a brief descrip... already provided. I... adjusted... In MonitoringResou... Implementation No...
OtherDataSources	The ContactAgency field identifies an organization involved in calculating the values in this record. This "OtherDataSources" field identifies additional organizations that provided data or expertise to calculate the indicator(s), metric(s), or age distribution for this record.	Text 255	List all the organiza... defined in the Conta... This field is for AD...
Comments abou...			
Comments	Any issues, problems, questions about this indicator that were not already captured in other places.	*Text ∞*	If possible, it is use... Required if NullRe...

A2. SAR Table   Codes/Conventions for NOSA Table

This table stores information concerning smolt to adult return rates (SAR). Smolt to adult return rates are specific to the smolt and adult locations described in each row of data.

Field Name	Field Description	Data Type
Supporting information		
NullRecord	In some years data may not be collected and so indicator values cannot be calculated. For example, high muddy water or wildfires can prevent redd counts that indicator values are based on. This field is used to indicate that indicator values do not exist because the data do not exist to calculate them.	**Text 3**
DataStatus	Status of the data in the current record.	**Text 255**
IndicatorLocation	Where this indicator is maintained at the source.	Text ∞
MetricLocation	Where the supporting metrics are maintained at the source.	Text ∞
MeasureLocation	Where the measurements are maintained that were used for these calculations.	Text ∞
ContactPersonFirst	First name of person who is the best contact for questions that may arise about this data record.	**Text 30**
ContactPersonLast	Last name of person who is the best contact for questions that may arise about this data record.	**Text 30**
ContactPhone	Phone number of person who is the best contact for questions that may arise about this data record.	**Text 30**
ContactEmail	Email address of person who is the best contact for questions that may arise about this data record.	**Text 50**
MetaComments	Comments regarding the supporting information.	Text ∞
Fields needed by people programming the Exchange Network		
If you are a programmer or database manager, refer to Appendix A for additional fields that are part of this table but are not listed here.		

Normally "No".
A value of "Yes" in this field is placed in each row of data to calculate the indicator for the population and time period specified. M...

The value of includ... that is repeatedly re... encouraged to create them for years with both earlier and later ... cannot be calculated...

Acceptable values: [*Do not include comments in brackets.*]
- Draft [*Values in this record are preliminary and have not been thoroughly reviewed.*]
- Reviewed [*Values in this record have been reviewed but are not yet approved as "final".*]
- Final [*Values in this record have been thoroughly reviewed and are considered "final".*]

If online, provide URL(s).
If online, provide URL(s).
If online, provide URL(s).

Preferred format is "123-456-7890".
If an extension is included, preferred format is "123-456-7890 ext. 34".

Field Name	Field Description	Data Type
Fields for defining a ...		
ID (unique)	Value used by computer to identify a record. Explain in the Comments field why the indicator ...	**GUID**
TimeSeriesID	This field identifies the time series a record belongs to. Records with the same TimeSeriesID are grouped and presented together on the CAX query systems. Assigned by data compilers or regional data assemblers as appropriate.	**Integer**
CommonName	Common name of the taxon of fish.	**Text 50**
Run	Run of fish.	**Text 20**

Field Name	Field Description	Data Type	Field Name	Field Description	Data Type	
RecoveryDomain	Name of the "recovery domain," as defined by the NMFS Northwest Region, in which the population falls geographically.	Text 255	Five recovery domains have been defined by NMFS in Washington, Oregon, and Idaho. Select the appropriate one from this list: • Puget Sound • Willamette/Lower Columbia • Interior Columbia • Oregon Coast • Southern Oregon/Northern California Coast	**ReturnDef** — "Sown return" is defined for this SAR estimate.	Text 255	Further information about recovery domains can be found at https://web.archive.org/web/20161215214 935/http://www.nwfsc.noaa.gov/trt/.	Acceptable values: • Fish surviving to • Returns to a dam • Returns to popul *mortalities, in the* • Returns to mouth *only if the mouth* • Returns to spawn *tributaries.*] • Returns to a weir • Returns to a PIT • Estimated number • Number of mark • Adult fish migra
ESU_DPS	For populations listed under the federal ESA, this is the name of a defined Evolutionarily Significant Unit (ESU) or Distinct Population Segment (DPS) as defined by NMFS Northwest Region or by USFWS. For non-listed populations this is the DPS or other name.	Text 255	Enter the name of the ESU or DPS here. Entries in this field are taxonomic divisions defined by NMFS or USFWS, and may be at the species, subspecies, or finer scale. ESUs of salmon north of California are listed at https://web.archive.org/web/20161215214935/http://www.nwfsc.noaa.gov/trt/.			
MajorPopGroup	Name of "major population group" (MPG) or "stratum" as defined by the NMFS Northwest Region, in which the population falls.	Text 255	The term "stratum" is used in the Willamette/Lower Columbia Recovery Domain, while "major population group" is used in other areas. The term "stratum" includes life history considerations as well as geographic criteria, while MPGs are defined geographically.			
PopID	Code for the population(s) of fish represented by this record.	**Integer**	See Appendix C if you need a code for a population or superpopulation not already in the list.	**SARtype** — The type of return estimate, in terms of what fish are included in the estimate of total returns. See Codes/Conventions column for details.	**Text 255**	Acceptable values: • Including jacks • Excluding jacks
CommonPopName	Population name used by local biologists.	Text 255	Often this is simply the name of the population(s) as written on the original time series spreadsheets.	**OutmigrationYear** — The four-digit year for which this SAR is calculated, defined as the year the group migrated to sea.	**Integer**	Year in which the f
PopFit	Categorization of how well the geographic extent of the SAR estimate corresponds to the geographic definition of the population.	**Text 8**	This value must be "Multiple" if PopID represents a superpopulation. Acceptable values: • Same [*Estimate represents one entire population, the whole population, and nothing but the population.*] • Portion [*Estimate represents a portion of one population. (Describe in PopFitNotes field.)*] • Multiple [*Estimate is from more than one population. (Describe in PopFitNotes field.)*]	**ContactAgency** — Agency, tribe, or other entity, or person responsible for these data that is the best contact for questions that may arise about this data record. [*Do not include comments in brackets.*]	**Text 255**	Entries in this field agency list. Here a here, contact your a StreamNet staff at 5 • Columbia River • Confederated Tri • Confederated Tri • Confederated Tri • Confederated Tri
PopFitNotes	Text description of how well the SAR value corresponds to the defined population, and why the data are not at the scale of a single population.	*Text ∞*	This field is required if the PopFit field is "Portion" or "Multiple". If the PopFit field is "Portion" or "Multiple", describe the lack of correspondence between the defined population and the scale at which the SAR estimate was made. Also state *why* this scale of data was used to represent the population instead of true population-scale data. (Examples: "Data not available at exact scale of this population."; "Data at this scale best represent the population.")			
SmoltLocation	The specific named location(s) where the smolt abundance numbers were determined.	**Text 255**	This may be any of the following: • the name of a fluvial water body • the name of an impounded fluvial water body (reservoir)	**MethodNumber** — This field represents the method(s) used to calculate the values in the "Indicators" and "Metrics" sections. This field is used in conjunction with the ContactAgency field. See the Codes/Conventions column for details. • the name of a lentic water body • a description of multiple water bodies if appropriate • the name of a dam, or weir, or trap, etc.	**Integer**	This field, along wi of) methods were u possible to share va If only one set of m changed, you can e If more than one se which records are n method 2 was used 1994. In such cases the 1980-2013 meth to indicate which re When more than on most use when cond
SmoltDef	How the number of smolts is defined.	**Text 255**	Acceptable values: • Number of smolts marked • Smolts outmigrating past a point		Acceptable values: • Smolts outmigrating past a point • Juveniles leaving tributary mouth • Juveniles leaving population boundary	
SmoltLocPTcode	PTAGIS code for the location where smolts were enumerated.	Text 255	There should be a PTAGIS code for most locations where smolts were trapped. Provide that code, or multiple codes if smolts were trapped at multiple locations for this population.			
AdultLocation	The specific named location(s) where the adult abundance numbers were determined.	**Text 255**	This may be any of the following: • the name of a fluvial water body • the name of an impounded fluvial water body (reservoir)		• the name of a lentic water body • a description of multiple water bodies if appropriate • the name of a dam, or weir, or trap, etc.	

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
BestValue	A declaration of whether the ContactAgency considers this record to be their approved best estimate for this combination of <u>PopID, SmoltLocation, SmoltDef, AdultLocation, ReturnDef, SARtype,</u> and <u>OutmigrationYear.</u> When a ContactAgency provides >1 record for that combination then "Yes" in this BestValue field indicates this record contains the indicator value the agency recognizes as their best estimate.	**Text 13**	Acceptable values: • Yes [*The entity (tribe, state agency, etc.) that produced the record recognizes it as their approved best estimate.*] • No [*Not recognized as the best estimate provided by that entity.*] • Not specified Notes regarding the ... 1. When only one r... 2. It is acceptable for all alternatives to have "No". "Yes" can be used a maximum of once per agency for the combination. 3. Different contact agencies can each specify "Yes" for the same combination.	**RearingType** [*Do not include comments*]	The rearing type (origin; production type) of the fish represented by this record.	**Text 8**	Acceptable values: • Natural • Mixed [*Known ...*] • Unknown [*Non ...*]
							Metrics supporting the "Ind...
				TSO	Total smolt outmigration. Point estimate of the number of smolts for this outmigration year, or the number of marked smolts used to calculate the SAR.	Integer	This should be the ... already taken out. ... Provide whole num...
Indicators				TSOLowerLimit	The lower limit of the confidence interval for the TSO field.	Integer	Minimum value = 0 ...
SAR	The point estimate for smolt-to-adult return rate, calculated as 100 X the point estimate of the number of returning <u>natural origin</u> adults, divided by the point estimate of the number of smolts that produced those returning adults. Do NOT include repeat spawners in the number of adult returns. (A fish only returns once from smolting; subsequent returns are not appropriate for inclusion in smolt-to-adult estimates because they head to sea as adults on subsequent trips and thus are not exposed to the same suite of mortality factors.)	**Real**	Required if NullRecord = "No". Express these values as percentages (numbers from zero to one hundred), with two digits to the right of the decimal point. Examples: .020 = 2.00, .00015 = 0.15. This field holds a numeric value only – the percent sign is implied but not included.	TSOUpperLimit	The upper limit of the confidence interval for the TSO field.	Integer	Minimum value = 0 ... suggest you consider ... transformations, and ...
				TSOAlpha	The significance level for the TSO confidence interval, expressed as alpha.	Real	Express these value...
SARLowerLimit	The lower limit of the confidence interval for the SAR field.	Real	This field holds a numeric value only – the percent sign is implied but not included. Minimum value = 0 and maximum = 100. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).	TAR	Total adult return. Point estimate of the number of adults returning <u>for the first time</u> from the indicated outmigration year, or the group of marked smolts (as appropriate), to match the outmigrants in the TSO field.	Integer	For iteroparous spe... result in some adult... Provide whole num... Minimum value = 0...
				TARLowerLimit	The lower limit of the confidence interval for the TAR field.	Integer	Minimum value = 0 ... suggest you consider ... transformations, and ...
SARUpperLimit	The upper limit of the confidence interval for the SAR field.	Real	This field holds a numeric value only – the percent sign is implied but not included. Minimum value = 0 and maximum = 100. If the calculated lower limit of the confidence interval is more than 100 you may report 100 in this field, but we suggest you consider statistical options that prevent values outside of possible limits.	TARUpperLimit	The upper limit of the confidence interval for the TAR field.	Integer	Minimum value = 0 ...
SARAlpha	The significance level for the SAR confidence interval, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".	TARAlpha	The significance level for the TAR confidence interval, expressed as alpha.	Real	Express these value...
				HarvestAdj	How was the return adjusted to account for harvest? (Are harvested fish included in the estimate of number of adults?)	Text 35	Acceptable values: • Ocean [*Value in...*] • Ocean and mains... • Ocean and mains... • Ocean and tribut... • Mainstem [*Valu...*] • Mainstem and tri... • Tributaries [*Val...*] • Not adjusted [*V...*]
ReturnsMissing	Whether any adult return years for this out-migration year were missing.	**Text 18**	Acceptable values: [*Do not include comments*] • Yes [*Years were missing.*] • No [*No years missing; return estimates were complete.*] • Not yet determined • N/A [*Not applicable*] Must be "N/A" if NullRecord = "Yes". Must not be "N/A" if NullRecord = "No". If some years were missing, describe how that gap was addressed under ReturnsMissingExplanation		• "Ocean" means fish harvested in the ocean. • "Mainstem" means fish harvested in the mainstem Columbia River, including the estuary. Do not indicate "mainstem" for populations outside the Columbia Basin. • "Tributaries" means streams other than the mainstem Columbia River		
ReturnsMissingExplanation	If some return data are not accounted for in the SAR estimate, explain the gap.	**Text ∞**	Describe how any gap in return years was addressed: Filled in with an interpolated estimate, ignored, etc. Required if ReturnsMissing = "Yes". Must be null if ReturnsMissing = "No".	OceanHarvest	The estimated number of fish from the smolt group indicated under the TSO field that were harvested in the ocean. The value of the SARtype field determines whether females, males, and/or jacks are included here.	Integer	This field is for har... adjust the return/rec...
ScopeOfInference	Description of what this SAR represents: the specific population(s); specific ESU/DPS(s); specific MPG(s); etc. represented.	Text 255	Identify the specific population(s), ESU(s), etc. ... ESU(s) or MPG(s) or population(s) represented ... "Scoggins Creek population" or "All populations above Lower Granite Dam" or other appropriate entry.		Do not set the SARtype field to "Population", but instead the specific population(s) should be included here.	Integer	This may no... value reflects fish h...

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
MainstemHarvest	The estimated number of fish from the smolt group indicated in the TSO field that were harvested in the mainstem (including the estuary). The value of the SARtype field determines whether females, males, and jacks are included here. This field is for use in the Columbia Basin only.	Integer	This field is only for mainstem adjustment estimate ONLY if it was used to adjust the return decimal values. This harvest value reflects fish harvested from the mixed origin, as indicated by the RearingType should be explained in the Methods citation.	MethodsAdjustment / Min study, which is defined in a given year that tributary not described in the model but citations about fish. Pare important. the indicated smolt group – they may be all natural origin, all hatchery field. This may or may not include indirect fishery impacts, and these dep The ContactAgency field identifies an organization	Minor study, which is defined in a given year that tributary not described in the model but citations about fish. Pare / all natural origin, all hatchery	Text ∞ / Text 255	Give this brief descrip only provided. I adjusted. MonitoringResou mentation No List all the organiza
TribHarvest	"Tributaries" is defined as the tributary(ies) the estuary harvest is included here for coastal and estimate ONLY if it was used to adjust the return decimal values. This harvest value m mixed origin, as ind should be explained	Integer	The estimated number of fish from the smolt group indicated in the TSO field that were harvested in tributaries. The value of the SARtype field determines whether females, males, and jacks are included here.	OtherDataSources	populated in calculating because "maintenance" refers only to the Columbia OtherDataSources field identifies additional mainstem harvest. Provide this organizations that provide back harvested fish to Provide whole numbers. Only, field calculate the indicator(s), metric(s), or age distribution for this record.	River, in the Cont This field is for AD	
					Comments about		
BroodStockRemoved	The number of additional fish that would have returned from the smolt group indicated in the TSO field, had there not been removal of fish for use as broodstock in a hatchery. The value of the SARtype field determines whether females, males, and jacks are included here.	Integer	This value reflects fish taken for hatchery use or mixed origin, as indicated by the RearingType Provide whole numbers only, not decimal values.	*Comments* / NullRecord	Any issues, problems, questions about this indicator from the indicated smolt group – they may be all natural origin, all hatchery field. Details should be explained in the Methods citation In some years data may not be collected and so indicator values cannot be calculated. For example, high muddy water or wildfires can prevent redd counts that indicator values are based on. This field is used to indicate that indicator values do not exist because the data do not exist to calculate them.	*Text ∞* / Text 3	If possible, it is use Required if NullRec **Supporting info** Normally "No". A value of "Yes" in period specified. M The value of includ that is repeatedly re encouraged to creat cannot be calculated
			Protocol and method documentation				
ProtMethName	The name(s) of all protocols and associated data collection and data analysis methods used to calculate the indicator estimate.	Text ∞	Provide title of protocol and name(s) of relevant methods used. Documentation should describe the study design (including spatial, temporal, response and inference designs), annual implementation notes on variations from routine step by step procedures or design criteria, also known as survey design, description of field methodology and analytical approach.	DataStatus	Status of the data in the current record.	Text 255	Acceptable values: • Draft [*Values in* • Reviewed [*Val* • Final [*Values in* If online, provide U
ProtMethURL	URL(s) for published protocols and methods describing the methodology and documenting the derivation of the indicator. If published in MonitoringResources.org, this link will provide access to study design information and all methods associated with the protocol.	*Text ∞*	Required if ProtMethDocumentation is null. Provide URL(s) to source documentation of methodology. For MonitoringResources.org provide link to the protocol documentation should include survey design, description of field methodology and analytical approach. URL links may be to online methods documentation resources like MonitoringResources.org, other online resources, or online literature. If methodology is unchanged from a previous year, provide a new link.	IndicatorLocation / MetricLocation / MeasureLocation	Where this indicator is maintained at the source. / Where the supporting metrics are maintained at the source the previous link references. If methodology changed for this / Where the measurements are maintained that were used for these calculations.	Text ∞ / Text ∞ / Text ∞	If online, provide U estimate, If online, provide U
ProtMethDocumentation	Citation or documentation that describes the protocol and/or method(s) listed in the ProtMethName field. Include references not documented in MonitoringResources.org, such as reports, journal articles or other publications that describe the survey design, field methodology and analytical approach used to derive the indicator estimate.	*Text ∞*	Required if ProtMethURL is null. Provide a citation(s) to documentation of the methodology used. This may be in the form of reports, journal articles, or other publications that describe the study design (including spatial, temporal, response and inference designs), variations from routine step by step procedures or design criteria, description of field methodology and analytical approach. If the methodology is not yet published, either insert here, or describe in a separate document and make it available online (provide the URL). Leave this field blank if methodology is described in MonitoringResources.org. Note: If there is no link to a cited document online, you may wish to submit the document to the Columbia Basin Fish & Wildlife Library (cbfwl.org). The Library will scan the document and provide a URL. Post the URL in the ProtMethURL field. If methodology is unchanged from a previous year, use the previous link or reference citation. If methodology changed, provide a new link or reference citation.	ContactPersonFirst / ContactPersonLast / ContactPhone / ContactEmail / MetaComments	First name of person who is the best contact for questions that may arise about this data record. / Last name of person who is the best contact for questions that may arise about this data record. / Phone number of person who is the best contact for questions that may arise about this data record. / Email address of person who is the best contact for questions that may arise about this data record. / Comments regarding the supporting information.	Text 30 / Text 30 / Text 30 / Text 30 / Text ∞	Preferred format is if an extension is in

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
				Fields needed by people programming the Exchange Network	Run of fish.	**Text 20**	Enter the name of t...
If you are a programmer or database manager, refer to Appendix A for additional fields that are part of this table but are not listed here.							name is included in... population. Entries... recognized as taxon... from the following: *comments in bracke...*

A3. RperS Table

This table stores information concerning recruits per spawner (R/S). Recruit per spawner ratios are specific to the locations described in each record of data. This table can include the number of juvenile or adult recruits as measures, or full life cycle productivity. That is, "recruit" can be defined at any life stage. (Back to Table of Contents)

| | | | | RecoveryDomain | Name of the "recovery domain," as defined by the NMFS Northwest Region, in which the population falls geographically. | Text 255 | Five recovery doma... defined by NMFS i... Oregon, and Idaho. appropriate one fro... |
| | | | | ESU_DPS | For populations listed under the federal ESA, this is the name of a defined Evolutionarily Significant Unit (ESU) or Distinct Population Segment (DPS) as defined by NMFS Northwest Region or by USFWS. For non-listed populations this is the DPS or other name. | Text 255 | Enter the name of t... at the species, subsp... https://web.archive... |

Field Name	Field Description	Data Type		**Codes/Conventions for RperS Table**			
				Fields for defining a unique record			
ID (unique)	Value used by computer to identify a record.	**GUID**	This value is a globally unique identifier (GUID) exactly 36 characters long. • When submitting a new record you may include this value or leave it blank. If you include this value then it will be used by the central system. If you leave it blank then a value will be created for you, and it will be sent back to your system where it must be incorporated. • When updating or deleting records this value must be...	MajorPopGroup	Name of "major population group" (MPG) or "stratum" as defined by the NMFS Northwest Region in which the population falls.	Text 255	The term "stratum"... areas. The term "st... geographically.
TimeSeriesID	This field identifies the time series a record belongs to. Records with the same TimeSeriesID are grouped and presented together on the CAX query systems. Assigned by data compilers or regional data assemblers as appropriate.	**Integer**	TimeSeriesID is used in several tables in this DES, in tables in the CA hatchery DES (HatcheryReturns, etc.), and in the Trend table of the StreamNet DES (where it is called "TrendID"). The same TimeSeriesID cannot be used in more than one of these tables. For records in this table with the same TimeSeriesID: • All PopID values must be the same. • The BroodYear may NOT be repeated • All RecruitDef values must be the same. • All RperStype values must be the same. Although not enforced, records with the same TimeSeriesID will usually have: • All SpawnerLocation values must be the same. • All RecruitLocation must be the same. If ownership of a time series is transferred between organizations, the TimeSeriesID is not changed.		PopID	Code for the population(s) of fish represented by this record, in several...	Integer	Assigned TimeSeriesID ranges are the same as assigned TrendID ranges in the StreamNet DES. Coordinate with other personnel in your organization assigning TimeSeriesID and TrendID values. 10,000-19,999 =MFWP 20,000-22,499= CRITFC 22,500-24,999 = NPT 25,000-27,499=CTWS 27,500-29,999=YN 200,000-299,999 =CTUIR 30,000-39,000 =USFWS 40,000-49,999 =IDFG 50,000-59,999; 500,000-599,999 = ODFW 100,000-199,999 = WDFW (GCT range jointly managed by WDFW and GCT)
				CommonPopName	Population name used by local biologists.	Text 255	Often this is simply...
				PopFit	Categorization of how well the geographic extent of the recruits per spawner estimate corresponds to the geographic definition of the population.	**Text 8**	This value must be... Acceptable values: • Same [*Estimate*... • Portion [*Estimate*... • Multiple [*Estim*...
				PopFitNotes	Text description of how the recruits per spawner value corresponds to the population, and why the data are not at the level of a single population.	**Text ∞**	This field is require... If the PopFit field i... which the recruits p... of true population-s... the population.")
				SpawnerLocation	The specific named locations where the spawner abundance numbers were determined.	**Text 255**	This may be any of... • the name of a flu... • the name of an in... • the name of a len...
CommonName	Common name of the taxon of fish.	**Text 50**	Select from the following: • Bull trout • Chinook salmon • Chum salmon • Coho salmon • Sockeye salmon • Steelhead				Additional species may be added in the future: refer to https://www.streamnet.org/resources/nw-fish/fish-species/ for common names. ...or description of r...

Field Name	Field Description	Data Type
RecruitLocation	The specific named location(s) where the recruit abundance numbers were determined.	**Text 255**
RecruitDef	How "recruit" is defined for this R/S estimate.	**Text 255**
RperStype	The type of recruit per spawner estimate, in terms of what fish are included in the estimates of number of spawners and number of recruits.	**Text 255**
BroodYear	The four-digit brood year for which the recruit per spawner ratio is calculated. Same as "spawning year" for the parent generation.	**Integer**

RecruitLocation detail: This field describes the location where the abundance numbers were determined:
- the name of a fluvial water body
- the name of an impounded fluvial water body
- the name of a lentic water body
- a description of multiple water bodies if appropriate for the time series
- the name of a dam, or weir, or trap, etc. where fish numbers can be estimated

RecruitDef detail:
Acceptable values: [Do not include comments in brackets.]
For juvenile recruits:
- Parr
- Juveniles migrating past a point(s)
- Juveniles leaving population boundary
For adult recruits:
- Fish surviving to adulthood [Potential returns...]
- Returns to a dam [Fish returning to a dam... the dam]
- Returns to mouth [Includes all fish that returned... removals or mortalities, in the tributaries. Appropriate... only if the mouth does not define the population]
- Returns to population boundary [Includes all fish that returned to the population boundary before any removals or mortalities, in the tributaries]
- Returns to spawning ground [Fish in river available to spawn after removals, but before pre-spawn mortality, in the tributaries]
- Returns to a weir [Fish returning to weir before removing broodstock or other removals at the weir, in the tributaries]
- Returns to a PIT tag array
- Estimated number of spawners [Fish available after all removals and pre-spawn mortality, in the tributaries (i.e., NOSA)]
- Number of marked adult fish captured
- Adult fish migrating to/past a point(s)

If more than one type of estimate is done for one brood year for a population, the estimates go in separate data records.

RperStype detail:
Acceptable values: [Do not include comments in brackets.]

For adult to adult R/S estimates:
- Total recruits per total spawners [Including jacks]
- Adult recruits per adult spawners [Excluding jacks]
- Female recruits per female spawners [All males excluded]

For R/S estimates from juvenile recruits:
Parr per total spawners

Additional fields:
- **ContactAgency** — Agency of individuals... responsible for these data that is the best contact for questions... [Text 255]
- **MethodNumber** — This field represents the method(s) used to calculate the values in the "Indicators" and "Metrics" sections. [Integer] This field is used in conjunction with the ContactAgency field. See the Codes/Conventions...
- **BestValue** — A declaration of whether the ContactAgency considers this record to be their approved best estimate for this combination of PopID, SpawnerLocation, RecruitLocation, RecruitDef, RperStype, and BroodYear. When a ContactAgency provides a record for that combination then "Yes" in this BestValue field indicates this record contains the indicator value the agency recognizes as their best estimate. [Text 13]
  Acceptable values:
  - Yes [The entity...]
  - No [Not recogn...]
  - Not specified
- **RperS** — The point estimate for the ratio of recruits from the designated brood year and RperStype, divided by the number of parent spawners responsible for that brood year. Straight ratio calculation, not a log/natural log transformation. [Real]
- **RperSLowerLimit** — The lower limit of the confidence interval for the RperS field. [Real]

Indicators:
- Smolts per total spawners [Including jacks]
- Parr per adult spawners [Excluding jacks]
- Smolts per adult spawners [Excluding jacks]
- Parr per female spawners [Includes female parents only]
- Smolts per female spawners [Includes female parents only]

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
RperSUpperLimit	The upper limit of the confidence interval for the RperS field.	Real	Minimum value = 0.	RecruitsAlpha	The significance level for the Recruits confidence interval, expressed as alpha.	Real	Express these value
RperSAlpha	The significance level for the RperS confidence interval, expressed as alpha.	Real	Express these values... For example... this field... the confidence interval enter 0.05 in this field...	RecruitsMissing	This field indicates whether any recruits for this year were missing.	Text 1%	Indicate if recruit es RecruitsMissingExp
	Metrics supporting the "Indicators" fields above				This field and the next are intended mainly for adult recruits data. An example where this field may be useful for juvenile fish is if an outmigration estimate is done only for spring-migrating fish, but it's known that some fish out-migrate during fall or winter. If such R/S estimates are done, then these fields would be helpful for juveniles also.		Acceptable values: • Yes [*Years wer* • No [*No years m* • Not yet determin • N/A [*Not applic* Must be "N/A" if N If some years were
TotalSpawners	Point estimate for the total number of parent spawners, both natural and hatchery origin, that produced the brood year this record reflects. The number in this field reflects the RperStype field above. That is, if this record is for total spawners then this number will be the total number of spawners; if this record is for females to females, then this number will be only the female spawners.	Integer	Provide whole numbers only, not decimal values.				
				RecruitsMissingExplanation	If some recruits data are not accounted for in the RperS estimate, explain the gap.	*Text ∞*	Explain how any ga *Required if Recruit*
TotalSpawnersLowerLimit	The lower limit of the confidence interval for the TotalSpawners field.	Integer	Minimum value = 0. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).	HarvestAdj	For adult returns, were possible returns adjusted to account for harvest? (Are harvested fish included in the estimate of number of recruits?)	Text 25	Acceptable values: • Ocean [*Value i* • Ocean and mains • Ocean and mains *tributaries*.] • Ocean and tributa
TotalSpawnersUpperLimit	The upper limit of the confidence interval for the TotalSpawners field.	Integer	Minimum value = 0.				
TotalSpawnersAlpha	The significance level for the TotalSpawners confidence interval, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".		• "Ocean" means fish harvested in the ocean. • "Mainstem" means fish harvested in the mainstem Columbia River, including the estuary. Do not indicate "mainstem" for populations outside the Columbia Basin. • "Tributaries" means streams other than the mainstem Columbia River.		• Mainstem [*Valu* • Mainstem and tr • Tributaries [*Va* • Not adjusted [*V*
HatcherySpawners	Point estimate for the number of parent spawners of <u>hatchery origin</u> that contributed to the brood year this record reflects. This number is the hatchery portion of the TotalSpawners field.	Integer	Provide whole numbers only, not decimal values.				
HatcherySpawnersLowerLimit	The lower limit of the confidence interval for the HatcherySpawners field.	Integer	Minimum value = 0. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).	OceanHarvest	The estimated number of adults and jacks from the recruit group indicated in the Recruits field that were harvested in the ocean.	Integer	This field is for har adjust the return/rec This may or may no
HatcherySpawnersUpperLimit	The upper limit of the confidence interval for the HatcherySpawners field.	Integer	Minimum value = 0.				value reflects fish h
HatcherySpawnersAlpha	The significance level for the HatcherySpawners confidence interval, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".	MainstemHarvest	The estimated number of adults and jacks from the recruit group indicated in the Recruits field that were harvested in the mainstem (including the estuary).	Integer	This field is only fo population. Provid whole numbers onl
Recruits	Point estimate for the total number of <u>natural origin</u> recruits from the indicated combination of species, run, population, spawner location, recruit location, brood year, and RperStype.	Integer	This is the sum of returns by juvenile life stage or age group as specified in the RperStype field. This is the number of fish recruited to the location indicated in the RecruitLocation field. Adult recruits should include all fish from the brood year that return to spawn, including repeat spawners, since repeat spawners add to the productivity of the population				This may or may no value reflects fish h
			Provide whole numbers only, not decimal values.	TribHarvest	The estimated number of adults and jacks from the recruit group indicated in the Recruits field that were harvested in tributaries.	Integer	"Tributaries" is def estuary harvest is in estimate ONLY if i decimal values.
RecruitsLowerLimit	The lower limit of the confidence interval for the Recruits field.	Integer	Minimum value = 0. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).				
RecruitsUpperLimit	The upper limit of the confidence interval for the Recruits field.	Integer	Minimum value = 0.				This may or may no value reflects fish h

Field Name	Field Description	Data Type	Codes/Conventions
NOBroodStockRemoved	The number of additional recruits that would have returned had there not been removal of fish from this brood year for use as broodstock in a hatchery.	Integer	Details should be explained in the Methods citation. Provide whole numbers only, not decimal values.

Age distribution

Juvenile Recruits:

Field Name	Field Description	Data Type	Codes/Conventions
YOY	Total number of juvenile recruits (parr or smolts) at age 0 (brood year +0).	Integer	Number of juvenile... Ages in this table are based on the year spawning occurred, not necessarily the year eggs hatched, so care must be taken in reporting ages. Assigning age can be complicated based on the life history (generally, salmon return and spawn in one year but hatch in the next, steelhead spawn and hatch in the same year). Make sure these details are accounted for in assigning ages. [Note – This means, we would never refer to age 0 salmon, because they hatch in the year after the eggs are laid, but for steelhead and other spring spawners YOY (age 0) is a valid age we would expect to see.]
Age1Juvs	Total number of juvenile recruits (parr or smolts) at age 1 (brood year +1).	Integer	See the Codes/Conventions for the YOY field.
Age2Juvs	Total number of juvenile recruits at age 2 (brood year +2).	Integer	See the Codes/Conventions for the YOY field.
Age3Juvs	Total number of juvenile recruits at age 3 (brood year +3).	Integer	See the Codes/Conventions for the YOY field.
Age4PlusJuvs	Total number of juvenile recruits at age 4 (brood year +4) or older.	Integer	See the Codes/Conventions for the YOY field.

Adult Recruits:

Field Name	Field Description	Data Type	Codes/Conventions
Age2Adults	Total number of adult recruits that recruited at age 2 (brood year +2).	Integer	Ages in this table are based on the year spawning occurred, not necessarily the year eggs hatched, so care must be taken in assigning returning fish to a brood year. Assigning returning fish to a brood year can be complicated based on the life history (generally, salmon return and spawn in one year but hatch in the next, steelhead spawn and hatch in the same year). Make sure these details are accounted for in assigning returns to a year class. Adult recruits should include all fish from the brood year that return to spawn, including repeat spawners, since repeat spawners add to the productivity of the population. Provide whole numbers only, not decimal values.
Age3Adults	Total number of adult recruits that recruited at age 3 (brood year +3).	Integer	See the Codes/Conventions column for the Age2Adults field.
Age4Adults	Total number of adult recruits that recruited at age 4 (brood year +4).	Integer	See the Codes/Conventions column for the Age2Adults field.
Age5Adults	Total number of adult recruits that recruited at age 5 (brood year +5).	Integer	See the Codes/Conventions column for the Age2Adults field.
Age6Adults	Total number of adult recruits that recruited at age 6 (brood year +6).	Integer	See the Codes/Conventions column for the Age2Adults field.
Age7Adults	Total number of adult recruits that recruited at age 7 (brood year +7).	Integer	See the Codes/Conventions column for the Age2Adults field.
Age8Adults	Total number of adult recruits that recruited at age 8 (brood year +8).	Integer	See the Codes/Conventions column for the Age2Adults field.

Field Name	Field Description	Data Type	Codes/Conventions
Age9Adults	Total number of adult recruits that recruited at age 9 (brood year +9).	Integer	See the Codes/Conv...
Age10Adults	Total number of adult recruits that recruited at age 10 (brood year +10).	Integer	See the Codes/Conv...
Age11PlusAdults	Total number of adult recruits that recruited at age 11 (brood year +11) or older.	Integer	See the Codes/Conv...

Protocol and method

Field Name	Field Description	Data Type	Codes/Conventions
ProtMethName	The names of all protocols and associated data collection and data analysis methods used to calculate the indicator estimate.	Text 255	Provide title(s) of p... Documentation should be in the next... Implementation note... description of field...
ProtMethURL	URL(s) for published protocols and methods describing the methodology and documenting the derivation of the indicator. If published in MonitoringResources.org, this link will provide access to study design information and all methods associated with the protocol	Text ∞	Required if ProtMe... Provide URL(s) to... documentation should... online methods doc... If methodology is u... provide a new link.
ProtMethDocumentation	Citation or documentation that describes the protocol and/or method(s) listed in the ProtMethName field. Include references not documented in MonitoringResources.org, such as reports, journal articles or other publications that describe the survey design, field methodology and analytical approach used to derive the indicator estimate.	Text ∞	Required if ProtMe... Provide a citation(s)... publications that de... step by step proced... published, either in... blank if methodolog... Note – If there is no... listing (cbfwl.org)... If methodology is u... new link or referen...
MethodAdjustments	Minor adjustments to a method in a given year that are not described in the method citations above but are important.	Text ∞	Give a brief descrip... already provided. I... adjusted. In MonitoringResou... Implementation No...
OtherDataSources	The ContactAgency field identifies an organization involved in calculating the values in this record. This "OtherDataSources" field identifies additional organizations that provided data or expertise to calculate the indicator(s), metric(s), or age distribution for this record.	Text 255	List all the organiza... defined in the Cont... This field is for AD...

Field Name	Field Description	Data Type	Codes/Conventions for RperS Table
			Comments about the data
Comments	Any issues, problems, questions about this indicator that were not already captured in other places.	*Text ∞*	If possible, it is use… Required if NullRe…
			Supporting information
NullRecord	In some years data may not be collected and so indicator values cannot be calculated. For example, high muddy water or wildfires can prevent redd counts that indicator values are based on. This field is used to indicate that indicator values do not exist because the data do not exist to calculate them.	**Text 3**	Normally "No". A value of "Yes" in this field is a positive statement that the data do not exist to calculate the indicator for the population and time period specified. Metric data and age data may still exist when NullRecord = "Yes". The value of including this field is so that missing data are explicitly accounted for rather than being a perpetually open question that is repeatedly researched. Including these "null" records allows for better data display on the web site, and you are encouraged to create them for years with both data and where data exist but Comments field why the indicator cannot be calculated.
DataStatus	Status of the data in the current record.	**Text 255**	Acceptable values: [*Do not include comments in brackets.*] • Draft [*Values in this record are preliminary and have not been thoroughly reviewed.*] • Reviewed [*Values in this record have been reviewed but are not yet approved as "final".*] • Final [*Values in this record have been thoroughly reviewed and are considered "final".*]
IndicatorLocation	Where this indicator is maintained at the source.	Text ∞	If online, provide URL(s).
MetricLocation	Where the supporting metrics are maintained at the source.	Text ∞	If online, provide URL(s).
MeasureLocation	Where the measurements are maintained that were used for these calculations.	Text ∞	If online, provide URL(s).
ContactPersonFirst	First name of person who is the best contact for questions that may arise about this data record.	**Text 30**	
ContactPersonLast	Last name of person who is the best contact for questions that may arise about this data record.	**Text 30**	
ContactPhone	Phone number of person who is the best contact for questions that may arise about this data record.	**Text 30**	Preferred format is "123-456-7890". If an extension is included, preferred format is "123-456-7890 ext. 34".
ContactEmail	Email address of person who is the best contact for questions that may arise about this data record.	**Text 50**	
MetaComments	Comments regarding the supporting information.	Text ∞	
		Fields needed by people programming the Exchange Network	
If you are a programmer or database manager, refer to Appendix A for additional fields that are part of this table but are not listed here.			

Overlapping table (right):

Field Name	Field Description	Data Type	
			Fields for defining a…
ID (unique)	Value used by computer to identify a record.	*GUID*	This value is a glob… • When submitting… the central syste… must be incorpor… • When updating…
TimeSeriesID	This field identifies the time series a record belongs to. Records with the same TimeSeriesID are grouped and presented together on the CAX query systems. Assigned by data compilers or regional data assemblers as appropriate.	*Integer*	TimeSeriesID is us… tables in the CA ha… the Trend table of t… "TrendID"). The s… than one of these ta… For records in this t… • All PopID value… • All SmoltEqLo… • All SmoltEqLo… • The Outmigratio… If ownership of a ti… organizations, the T…
CommonName	Common name of the taxon of fish.	**Text 50**	Select from the foll…
Run	Run of fish.	**Text 20**	Enter the name of t… even if run name is… the name of the pop… Entries in this field… recognized as taxon… divisions. Select fr… following: [*Do no… comments in brack…*
RecoveryDomain	Name of the "recovery domain," as defined by the NMFS Northwest Region, in which the population falls geographically.	Text 255	Five recovery doma… have been defined b… NMFS in Washing… Oregon, and Idaho. … the appropriate one… this list:

A4.1. JuvenileOutmigrants Table
This table stores information concerning the number of natural origin juvenile outmigrants to the location defined in each data record. The

Field Name	Field Description	Data Type	Field Name	Field Description	Data Type	
ESU_DPS	For populations listed under the federal ESA, this is the name of a defined Evolutionarily Significant Unit (ESU) or Distinct Population Segment (DPS) as defined by NMFS Northwest Region or by USFWS. For non-listed populations this is the DPS or other name.	Text 255				
MajorPopGroup	Name of "major population group" (MPG) or "stratum" as defined by the NMFS Northwest Region, in which the population falls. Enter "N/A" if not applicable.	Text 255		The term "stratum" is used in the Willamette/Lower Columbia Recovery Domain, while "major population group" is used in other areas. The term "stratum" includes life history considerations as well as geographic criteria, while MPGs are defined geographically.		
PopID	Code for the population(s) of fish represented by this record.	Integer		See Appendix C if you need a code for a population (or superpopulation) not already in the list.		
			MethodNumber	This field represents the method(s) used to calculate the values in the "Indicators" and "Metrics" sections.	Integer	
CommonPopName	Population name used by local biologists.	Text 255		Often this is simply the name of the population(s) as written on the original time series spreadsheets.		
PopFit	Categorization of how well the geographic extent of the juvenile outmigrants estimate corresponds to the geographic definition of the population.	Text 8		This value must be "Multiple" if PopID represents a superpopulation. Acceptable values: [Do not include comments in brackets.] • Same [Estimate represents one entire population, the whole population, and nothing but the population.] • Portion [Estimate represents a portion of one population. (Describe in PopFitNotes field.)] • Multiple [Estimate is from more than one population. (Describe in PopFitNotes field.)]		
PopFitNotes	Text description of how well the juvenile outmigrants value corresponds to the defined population, and why the data are not at the scale of a single population.	Text ∞		This field is required if the PopFit field is "Portion" or "Multiple". If the PopFit field is "Portion" or "Multiple", describe the lack of correspondence between the defined population and which the juvenile outmigrants estimate was made. Also state why this scale of data was used to represent the population instead of true population-scale data. (Examples: "Data not available at exact scale of this population."; "Data at this scale best represent the population.")		
SmoltEqLocation	The specific location(s) where the outmigrant abundance numbers were determined. [This table was originally designed for only "smolt equivalents". Later it was modified for other units of measure. This field name stays the same despite the widening of its meaning.]	Text 255		This may be any of the following: • the name of a fluvial water body, and text description of where on that stream or river (river mile preferred, but river kilometer, lat/long, or other characterization allowable) • the name of an impounded fluvial water body (reservoir), and description of where on that reservoir. • the name of a lentic water body, and description of where on that lake. • a description of multiple water bodies if appropriate • the name of a dam, or weir, or trap, etc.		
			BestValue	A declaration of whether the ContactAgency considers this record to be their approved best estimate for this combination of PopID, PopFit, and OutmigrationYear. When a ContactAgency provides >1 record for that combination then "Yes" in this BestValue field indicates this record contains the indicator value the agency recognizes as their best estimate.	Text 13	
SmoltEqLocationCategory	Categorization of the location given in the SmoltEqLocation field relative to the population's hydrologic extent.	Text 33		Must be one of the following: • Within population boundary [Outmigrants value calculated for location within the population boundary or at the downstream-most boundary of the population.] • Downstream of population boundary [Outmigrants value calculated for location significantly downstream of the population boundary.]		
SmoltEqLocPTcode	PTAGIS code for the SmoltEqLocation field.	Text 255		There should be a PTAGIS code for most locations where outmigrant abundance is estimated. Provide that code if available. Provide multiple codes if outmigrant abundance was determined by summing estimates at multiple locations for this population.		
OutmigrationYear	The four-digit year of the spring/summer in which outmigration of this species occurred.	Integer		Juvenile anadromous fishes generally migrate to the ocean in the spring. However, a significant portion of the migration may occur in the fall or winter before, or continue into summer. Enter here the year of the spring migration even if the migration begins earlier.		

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
			Indicato				
					Metrics supporting the "Indicators" fields above can be found in the Juv		

TotalNatural	The point estimate, to the location defined in the SmoltEqLocation field, of:
	• the number of spring/summer smolt equivalents for
	  o bull trout
	  o coastal cutthroat trout
	  o coho salmon
	  o east-side spring/summer (stream-type) Chinook salmon
	  o steelhead;
	• the total number of outmigrants of all types for
	  o fall Chinook salmon
	  o lower Columbia spring Chinook salmon
	  o upper Columbia summer Chinook salmon
	  o Willamette spring Chinook salmon;
	• the number of smolts for
	  o chum salmon
	  o pink salmon
	  o sockeye salmon.
		Integer	Estimated total nu
			spawned in the wil
			
			"Smolt equivalents
			a single location at the smolt life stage. See Appendix E for a detailed explanation.
			
			The statistical approach used to generate the estimate should be thoroughly explained in the methods referenced in the ProtMethURL / ProtMethDocumentation fields.
			
			Provide whole numbers only, not decimal values.
			
			Required if NullRecord = "No".
				Age0Prop	The proportion of natural origin fish that were age 0 (brood year +0).	Real	Values must be bet
							Ages in this table a
							reporting ages.
							
							Assigning age can
							steelhead spawn an
							we would never ref
							spawners age 0 is a
							
							The age distribution
							1. These age fields
							  they the expande
							  • The juvenile

TotalNaturalLowerLimit	The lower limit of the confidence interval for the TotalNatural field.	Integer	Minimum value = 0. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).				500 fish wer After age an • In this case t
TotalNaturalUpperLimit	The upper limit of the confidence interval for the TotalNatural field.	Integer	Minimum value = 0.				2. The values of the 3. The age distribu Therefore, do n
TotalNaturalAlpha	The significance level for the TotalNatural confidence interval, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".				The age informatio fish. For example, case, ensure this in
				Age0PropLowerLimit	The lower limit of the confidence interval for the Age0Prop field.	Real	Minimum value = 0 in this field, but we normal distribution The associated alph
				Age0PropUpperLimit	The upper limit of the confidence interval for the Age0Prop field.	Real	Minimum value = 0 1.0 in this field, bu
				Age1Prop	The proportion of natural origin fish that were age 1 (brood year +1).	Real	See the Codes/Con
				Age1PropLowerLimit	The lower limit of the confidence interval for the Age1Prop field.	Real	See the Codes/Con
				Age1PropUpperLimit	The upper limit of the confidence interval for the Age1Prop field.	Real	See the Codes/Con
				Age2Prop	The proportion of natural origin fish that were age 2 (brood year +2).	Real	See the Codes/Con
				Age2PropLowerLimit	The lower limit of the confidence interval for the Age2Prop field.	Real	See the Codes/Con

Left column table

Field Name	Field Description	Data Type	Codes/Conventions
Age2PropUpperLimit	The upper limit of the confidence interval for the Age2Prop field.	Real	See the Codes/Conventions column for the Age0Prop field.
Age3Prop	The proportion of natural origin fish that were age 3 (brood year +3).	Real	See the Codes/Conventions column for the Age0Prop field.
Age3PropLowerLimit	The lower limit of the confidence interval for the Age3Prop field.	Real	See the Codes/Conventions for the Age0PropLowerLimit field.
Age3PropUpperLimit	The upper limit of the confidence interval for the Age3Prop field.	Real	See the Codes/Conventions for the Age0PropUpperLimit field.
Age4PlusProp	The proportion of natural origin fish that were age 4 or higher (brood year +4) or older.	Real	See the Codes/Conventions column for the Age0Prop field.
Age4PlusPropLowerLimit	The lower limit of the confidence interval for the Age4PlusProp field.	Real	See the Codes/Conventions for the Age0PropLowerLimit field.
Age4PlusPropUpperLimit	The upper limit of the confidence interval for the Age4PlusProp field.	Real	See the Codes/Con...
AgePropAlpha	The significance level for the Age_x_Prop confidence intervals, expressed as alpha.	Real	Express these values as alpha values. For example, for the 95% confidence limits enter "0.05" in this field, not "95".

Protocol and method documentation

Field Name	Field Description	Data Type	Codes/Conventions
ProtMethName	The name(s) of all protocols and associated data collection and data analysis methods used to calculate the indicator estimate.	Text ∞	Provide title of protocol and name(s) of relevant... Documentation should describe the study design... implementation notes on variations from routine... description of field methodology and analytical approach.
ProtMethURL	URL(s) for published protocols and methods describing the methodology and documenting the derivation of the indicator. If published in MonitoringResources.org, this link will provide access to study design information and all methods associated with the protocol.	*Text ∞*	Required if ProtMethDocumentation is null. Provide URL(s) to source documentation of methodology. For MonitoringResources.org provide link to the protocol description of field methodology and analytical approach. URL links may be to online methods documentation resources like MonitoringResources.org, other online resources, or online literature. If methodology is unchanged from a previous year, use the previous link references. If methodology changed for this estimate, provide a new link.
ProtMethDocumentation	Citation or documentation that describes the protocol and/or method(s) listed in the ProtMethName field. Include references not documented in MonitoringResources.org, such as reports, journal articles or other publications that describe the survey design, field methodology and analytical approach used to derive the indicator estimate.	*Text ∞*	Required if ProtMethURL is null. Provide a citation(s) to documentation of the methodology that may be in the form of reports, journal articles, or other publications that describe the study design (including spatial, temporal, response and inference designs), variations from routine step by step procedures or design criteria, description of field methodology and analytical approach. If the methodology is not yet published, either insert here, or describe in a separate document and make it available online (provide the URL). Leave this field blank if methodology is described in MonitoringResources.org. Note: If there is no online document or URL, provide a copy of the document or file to the Columbia Basin Fish and Wildlife Library (cbfwl.org). The Library will scan the document and may store a URL, then insert the URL in the ProtMethURL field. If methodology is unchanged from a previous year... a new link or reference.

Right column table

Field Name	Field Description	Data Type	Codes/Conventions
MethodAdjustments	Minor adjustments to a method in a given year that are not described in the method citations above but are important.	Text ∞	Give a brief description. ... already provided. In MonitoringResources.org Implementation No... adjusted.
OtherDataSources	The ContactAgency field identifies an organization involved in calculating the values in this record. This "OtherDataSources" field identifies additional organizations that provided data or expertise to calculate the indicator(s), metric(s), or age distribution for this record.	Text 255	List all the organiz... defined in the Cont... This field is for AD...

Comments about...

Field Name	Field Description	Data Type	Codes/Conventions
Comments	Any issues, problems, questions about this indicator that were not already captured in other places.	*Text ∞*	If possible, it is use... Required if *NullRe...*

Supporting info...

Field Name	Field Description	Data Type	Codes/Conventions
NullRecord	In some years data may not be collected and so indicator values cannot be calculated. For example, high muddy water or wildfires can prevent redd counts that indicator values are based on. This field is used to indicate that indicator values do not exist because the data do not exist to calculate them.	*Text 3*	Normally "No". A value of "Yes" in... time period specific... The value of includ... that is repeatedly re... encouraged to crea... cannot be calculate...
DataStatus	Status of the data in the current record.	*Text 255*	Methods Acceptable values: • Draft [*Values i...*] • Reviewed [*Val...*] • Final [*Values i...*]
IndicatorLocation	Where this indicator is maintained at the source.	Text ∞	If online, provide U...
ContactPersonFirst	First name of person who is the best contact for questions that may arise about this data record.	*Text 30*	
ContactPersonLast	Last name of person who is the best contact for questions that may arise about this data record.	*Text 30*	
ContactPhone	Phone number of person who is the best contact for questions that may arise about this data record.	*Text 30*	Preferred format is... If an extension is in...
ContactEmail	Email address of person who is the best contact for questions that may arise about this data record.	*Text 50*	
MetaComments	Comments regarding the supporting information.	Text ∞	

Fields needed by people programm...

If you are a programmer or database manager, refer to Appendix A for additional fields that are part of this table but a...

A4.2. JuvenileOutmigrantsDetail Table

This table is a child of the JuvenileOutmigrants table. It stores metrics (outmigrant numbers and survival rates – see Appendix E) specific to the trapping site(s) and life stages used to calculate the juvenile outmigrant estimates captured in the JuvenileOutmigrants table. (Back to JuvenileOutmigrants table) (Back to Table of Contents)

Field Name	Field Description	Data Type	Codes/Conventions for JuvenileOutmigrantsDetail Table
	Fields for defining a unique record		
ID (unique)	Value used by computer to identify a record.	**GUID**	This value is a globally unique identifier (GUID) exactly 36 characters long. • When submitting a new record you may include this value or leave it blank. If you include this value then it will be used by the central system. If you leave it blank then a value will be created for you, and it will be sent back to your system where it must be incorporated. • When updating or deleting records this value must be included.
	Fields for linking to parent table		
JuvenileOutmigrantsID	Foreign key used to identify the parent record in the JuvenileOutmigrants table.	**GUID**	The ID of the parent record is a 36 character GUID returned by StreamNet when the parent record is loaded must be applied to both the JuvenileOutmigrants table and the child records in this table.
	Metrics supporting the "Indicators" fields in the JuvenileOutmigrants table		
Location	The specific location (trapping site) where abundance numbers were determined.	**Text 255**	This may be any of the following: • the name of a fluvial water body, and text description of where on that stream or river (river mile preferred, but river kilometer, lat/long, or other characterization allowable) • the name of an impounded fluvial water body (reservoir), and description of where on that reservoir • the name of a lentic water body, and description of where on that lake • the name of a dam, or weir, or trap, etc.
LocPTcode	PTAGIS code for the Location field.	Text 255	There should be a PTAGIS code for most locations represented by this record.
LifeStage	Life stage the record represents.	**Text 11**	This field is required if NullRecord = "No". Acceptable values: Use one of the following sets of values, depending on the fish.

Field Name	Field Description	Data Type	
			For • Lower Columbia... use the following: o Subyearling o Yearling
			For • Upper Columbia... use the following: o Fry o Subyearling
TotalNatural	The point estimate for the number of natural origin fish of the indicated life stage passing the indicated location. That GUID preferably is supplied by the data provider; if it is not provided when the record is loaded must be applied to both the JuvenileOutmigrants table. ProtMethURL / Pro... TotalNatural field.	**Integer**	This field is required... Estimated number of... suggest you consider transformations, an...
TotalNaturalLowerLimit	The lower limit of the confidence interval for the TotalNatural field.	Integer	Minimum value = 0...
TotalNaturalUpperLimit	The upper limit of the confidence interval for the TotalNatural field on that stream or river (river mile preferred, but river kilometer,...	Integer	Minimum value = 0...
TotalNaturalAlpha	The significance level for the TotalNatural confidence interval, expressed as alpha.	Real	Express these values...
SurvivalRate	The point estimate for the survival rate of fish from the life stage and trapping site indicated by the LifeStage and Location fields... The Location field... stage. The SmoltEq... number of outmigra... "1" because the dat...	**Real**	This field is required... Express as a proportion...
SurvivalRateLowerLimit	The lower limit of the confidence interval for the SurvivalRate field.	Real	Minimum value = 0... in this field, but we... normal distribution...
SurvivalRateUpperLimit	The upper limit of the confidence interval for the SurvivalRate field.	Real	Minimum value = 0... 1.0 in this field, but...
SurvivalRateAlpha	The significance level for the SurvivalRate confidence interval, expressed as alpha.	Real	Express these value...

This table stores information concerning natural origin presmolt abundance. "Presmolt abundance" is the total number of fish estimated for the population and time frame (year and months) indicated by each record. Most commonly these records will represent parr numbers estimated for late summer, but other times may be entered, and all presmolt life stages are included in these estimates.

Field Name	Field Description	Data Type		
ContactAgency	Agency, tribe, or other entity, or person responsible for these data that is the best contact for questions that may arise about this data record.	**Text 255**	Entries in this field ... matches ... name in the StreamNet agency list. Here are the ones most likely needed. If yours is not found here, contact your data or StreamNet representative, or call PSMFC's StreamNet staff at 503-595-3100. • Columbia River Inter-Tribal Fish Commission • Confederated Tribes ... Reservation • Confederated Tribes ... Yakama Nation • Confederated Tribes of the Umatilla Indian Reservation • Confederated Tribes of the Warm Springs Reservation of Oregon	• Idaho Department of Fish and Game • Nez Perce Tribe • ... Commission • Oregon Department of Fish and Wildlife • Quantitative Consultants, Inc. • Shoshone-Bannock Tribes • Spokane Tribe of Indians • U.S. Fish and Wildlife Service

Field Name	Field Description	Data Type	
			Fields for defining a
ID	Value used by computer to identify a record.	***GUID***	This value is a glob... • When submitting ... the central syste... must be incorpo... • When updating ...
TimeSeriesID	This field identifies the time series a record belongs to. Records with the same TimeSeriesID are grouped and presented together on the CAX query systems. Assigned by data compilers or regional data assemblers as appropriate.	**Integer**	TimeSeriesID is us... tables in the CA ha... the Trend table of... "TrendID"). The s... than one of these ta... For records in this... • All PopID values...
CommonName	Common name of the taxon of fish.	**Text 50**	• All WaterBody... That Sur... ... If ownership of a t... organization, the ... Select from the fol...
Run	Run of fish.	**Text 20**	Enter the name of ... name is included in ... population. Entrie... recognized as taxo... from the following... *comments in brack...*

Comments about the metrics data

Comments	Any issues, problems, questions about this record that were not already captured in other places.	***Text ∞***	If possible, it is useful to briefly explain any null metrics or age fields. Required if NullRecord = "Yes", to explain why the indicators are not available.

Supporting information

NullRecord	In some years data may not be collected and so a value cannot be calculated. For example, high muddy water or wildfires can prevent redd counts. This field is used to indicate that metric values do not exist because the data do not exist to calculate them.	**Text 3**	Normally "No". A value of "Yes" in this field is a positive statement that the data do not exist to calculate the metric for the population X life stage X time period specified. The value of including this field is so that missing data are explicitly accounted for rather than being a perpetually open question that is repeatedly researched. Including these 'null' records allows for better data display on the web site, and you are encouraged to create them for years with both earlier and later non-null data. Explain in the Comments field why the metric cannot be calculated.
MetricLocation	Where this supporting metric is maintained at the source.	Text ∞	If online, provide URL(s).
MeasureLocation	Where the measurements are maintained that were used to calculate this metric.	Text ∞	If online, provide URL(s).

Fields needed by people programming the Exchange Network

If you are a programmer or database manager, refer to Appendix A for additional fields that are part of this table but are not listed here.

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
RecoveryDomain	Name of the "recovery domain," as defined by the NMFS Northwest Region, in which the population falls geographically.	Text 255	Five recovery domains have been defined by NMFS in Washington, Oregon, and Idaho. Select the appropriate one from this list: • Puget Sound • Willamette/Lower Columbia • Interior Columbia • Oregon Coast • Southern Oregon/Northern California Coast	ContactAgency	Agency, tribe, or other entity, or person responsible for this data record that is the best contact for questions that may arise about this data record.	Text 255	Entries in this field... StreamNet agency... needed... If yours is... StreamNet represen... staff at 503-595-31...
ESU_DPS	For populations listed under the federal ESA, this is the name of a defined Evolutionarily Significant Unit (ESU) or Distinct Population Segment (DPS) as defined by NMFS Northwest Region or by USFWS. For non-listed populations this is the DPS or other name.	Text 255	Enter the name of the ESU or DPS here. Entries in this field are taxonomic divisions defined by NMFS or USFWS, and may be at the species, subspecies, or finer scale. ESUs of salmon north of California are listed at https://web.archive.org/web/20161215214935/http://www.nwfsc.noaa.gov/trt/.				• Columbia River... • Confederated Tr... • Confederated Tr... • Confederated Tr... Reservation • Confederated Tr... of Oregon
MajorPopGroup	Name of "major population group" (MPG) or "stratum" as defined by the NMFS Northwest Region, in which the population falls.	Text 255	The term "stratum" is used in the Willamette/Lower Columbia Recovery Domain, while "major population group" is used in other areas. The term "stratum" includes life history considerations as well as geographic criteria, while MPGs are defined geographically.	MethodNumber	This field represents the method(s) used to calculate the values in the "Indicators" and "Metrics" sections. This field is used in conjunction with the ContactAgency field. See the Codes/Conventions column for details.	Integer	This field, along w... of) methods were u... possible to share v... If only one set of n... changed, you can e...
PopID	Code for the population(s) of fish represented by this record.	Integer	See Appendix C if you need a code for a population (or superpopulation) not already in the list.				
CommonPopName	Population name used by local biologists.	Text 255	Often this is simply the name of the population(s) as written on the original time series spreadsheets.				
PopFit	Categorization of how well the geographic extent of the abundance estimate corresponds to the geographic definition of the population.	Text 8	This value must be "Multiple" if PopID represents a superpopulation. Acceptable values: [Do not include comments in brackets.] • Same [Estimate represents one entire population, the whole population, and nothing but the population.] • Portion [Estimate represents a portion of one population. (Describe in PopFitNotes field.)] • Multiple [Estimate is from more than one population. (Describe in PopFitNotes field.)]				If more than one se... which records are r... method 2 was used... 1994. In such case... the 1980-2013 met...
PopFitNotes	Text description of how well the natural origin spawner abundance value corresponds to the defined population, and why the data are not at the scale of a single population.	Text ∞	This field is required if the PopFit field is "Portion" or "Multiple". If the PopFit field is "Portion" or "Multiple", describe the lack of correspondence between the defined population and the fish for which the abundance estimate was made. Also state why this scale of data was used to represent the population instead of population-scale data. (Examples: "Data not available at exact scale of this population."; "Data at this scale best represents the population.")				to indicate which r... the fish for When more than o... when con...
WaterBody	Name of the body of water associated with the time series.	Text 255	This may be any of the following: • the name of a fluvial water body. • the name of an impounded fluvial water body (reservoir). • the name of a lentic water body. • a description of multiple water bodies if appropriate for the time series.	BestValue	A declaration of whether the ContactAgency considers this record to be their approved best estimate for this combination of PopID, PopFit, and SurveyYear. When a ContactAgency provides >1 record for that combination, then "Yes" in this BestValue field indicates this record contains the indicator value the agency recognizes as their best estimate.	Text 13	Acceptable values: • Yes [The entity... • No [Not recog... • Not specified Notes regarding th... 1. When only one... 2. It is acceptable... 3. Different contac...
SurveyYear	The four-digit year represented.	Integer					
StartMonth	The month presmolt sampling started.	Text 9	Enter full name of month, correctly spelled.				
EndMonth	The month presmolt sampling ended.	Text 9	Enter full name of...				

						Indicato...
Abundance	The point estimate for natural origin presmolt abundance.	Integer	Required if NullRe... Estimated number... spawned in the wil... should be thoroughl...
AbundanceLowerLimit	The lower limit of the confidence interval for the Abundance field.	Integer	Minimum value =... we suggest you con... transformations, an...

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
AbundanceUpperLimit	The upper limit of the confidence interval for the Abundance field.	Integer	Minimum value = 0	Age1PropLowerLimit	The lower limit of the confidence interval for the Age2Prop field.	Real	See the Codes/Con
AbundanceAlpha	The significance level for the Abundance confidence interval, expressed as alpha.	Real	Express these value...	Age1PropUpperLimit	The upper limit of the confidence interval for the Age2Prop field.	Real	See the Codes/Con
	Metrics supporting the "Indicators" fields above			Age2Prop	The proportion of natural origin fish that were age 2 (brood year +2).	Real	See the Codes/Con
	Because of the diversity of ways in which presmolt numbers may be determined, there is no common set of fields to act as "Metrics" for this data type. Therefore, at least initially, there are no "metrics" fields in this table.			Age2PropLowerLimit	The lower limit of the confidence interval for the Age2Prop field.	Real	See the Codes/Con
				Age2PropUpperLimit	The upper limit of the confidence interval for the Age2Prop field.	Real	See the Codes/Con
	Age distribution			Age3Prop	The proportion of natural origin fish that were age 3 (brood year +3).	Real	See the Codes/Con
Age0Prop	The proportion of natural origin fish that were age 0 (brood year +0).	Real	Values must be between 0 and 1. Express with 2 digits to the right of the decimal point.

Ages in this table are based on the year spawning occured, not necessarily the year eggs hatched, so care must be taken in reporting ages.

Assigning age can be complicated based on the life history of natural origin fish that spawn age 1 one year (both scale and age based on the details are older accounted for in assigning ages.   [Note – This means we would never refer to age 0 salmon, because they hatch in the year after the eggs are laid, but for steelhead and other spring spawners age 0 is a valid age we would expect to see.)

The age distribution numbers reported here must meet three criteria. If these criteria are not met then do not report ages.
1. These age fields contain proportions by age for the natural origin fish. They are not the numbers of fish actually aged, nor are they the expanded age of a population. Consider this scenario for the Age_x_Prop confidence
    a. The presmolt number estimate is 100,000 fish (as reported in the Abundance field)
    b. 500 fish we
    c. After age an
    d. In this case me value in this field should be 0.43 (43,000/100,000) not 43,000, 500, or 100,000.
2. The values of the Age0Prop through Age4PlusProp fields must sum to 1.00 ± 0.01.
3. The age distribution must be derived only from the natural origin fish of the specific population and year this record represents. Therefore, do not include age data that are derived in part or in whole from any other group of fish.

The age information may represent the exact group of fish indicated in the Abundance field, or a somewhat different group of fish. For example, the ages may have been taken from a geographic or temporal subset of the population. Whatever may be the case, ensure this information is included in the protocol and method documentation section below. | | | Age3PropLowerLimit | The lower limit of the confidence interval for the Age3Prop field. | Real | See the Codes/Con |
				Age3PropUpperLimit	The upper limit of the confidence interval for the Age3Prop field.	Real	See the Codes/Con
				Age4PlusProp	The proportion of natural origin fish that were age 4 (brood year +4) or older.	Real	See the Codes/Con
				Age4PlusPropLowerLimit	The lower limit of the confidence interval for the Age4PlusProp field.	Real	See the Codes/Con
				Age4PlusPropUpperLimit	The upper limit of the confidence interval for the Age4PlusProp field.	Real	See the Codes/Con
				AgePropAlpha	Consider this scenario for the Age_x_Prop confidence interval (as expressed in alpha)	Real	Express these valu
					Protocol and method		
				GeneralApproach	The general class of method(s) used to make the abundance estimate.	**Text 255**	Acceptable values: • Snorkeling • Mark/recapture • Removal estima • Presmolt taggin • Downstream migrant t • Not applicable
Age0PropLowerLimit	The lower limit of the confidence interval for the Age2Prop field.	Real	The associated alpha value is in the AgePropAlpha field, which is found below after the fields for age 4+.				(Contact Mike Ba
			Minimum value = 0 and maximum = 1. If the calculated lower limit of the confidence interval is less than zero you may report 0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits (these include non-normal distributions, transformations, and/or bootstrapping approaches).	ProtMethName	The name(s) of all protocols and associated data collection and data analysis methods used to calculate the indicator estimate	Text	Provide title of pro Documentation sho implementation no description of field
Age0PropUpperLimit	The upper limit of the confidence interval for the Age2Prop field.	Real	Minimum value = 0 and maximum = 1. If the calculated lower limit of the confidence interval is more than 1.0 you may report 1.0 in this field, but we suggest you consider statistical options that prevent values outside of possible limits.				
Age1Prop	The proportion of natural origin fish that were age 2 (brood year +1).	Real	See the Codes/Conventions column for the Age0Prop field.				

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
ProtMethURL	URL(s) for published protocols and methods describing the methodology and documenting the derivation of the indicator. If published in MonitoringResources.org, this link will provide access to study design information and all methods associated with the protocol.	*Text ∞*	Required if ProtM... Provide URL(s) to documentation sho... online methods doc... If methodology is unchanged from a previous... provide a new link.	**NullRecord**	description of field methodology and analytical approach. URL links m... MonitoringResources.org or other online literature. ...high muddy water or wildfires can prevent redd counts ...indicate that indicator values do not exist because the data do not exist to calculate them.	**Text 3**	Normally "No". A value of "Yes" i... time period specific... The value of inclu...
ProtMethDocumentation	Citation or documentation that describes the protocol and/or method(s) listed in the ProtMethName field. Include references not documented in MonitoringResources.org, such as reports, journal articles or other publications that describe the survey design, field methodology and analytical approach used to derive the indicator estimate.	*Text ∞*	Required if ProtMethURL is null. Provide a citation(s) to documentation of the methodology used. This may be in the form of reports, journal articles, publications that describe the study design (including spatial, temporal, response and inference designs), variations from... step by step proce... criteria, desc... yet published, either insert here, or describe in a separate document and make it available online (provide the URL). Leave this field blank if methodology is described in MonitoringResources.org. Note: If there is no link to a cited document online, provide a copy of the document to the Columbia Basin Fish & Wildlife Library (cbfwl.org)... The Library will scan the document and provide a URL. Post the URL in the ProtMethURL field. If methodology is unchanged from a previous year, use the previous link or reference citation. If methodology changed, provide a new link or reference citation.		**DataOrigin** **IndicatorLocation** MetricLocation MeasureLocation	Station of field methodology and analytical approach. If the methodology... Where this indicator is maintained at the source. Where the supporting metrics are maintained at the source. Where the measurements are maintained that were used...	**Text 255** Text ∞ Text ∞ Text ∞	Acceptable values: • Draft [Values i... • Reviewed [Val... • Final [Values i... If online, provide U If online, provide U If online, provide U
MethodAdjustments	Minor adjustments to a method in a given year that are not described in the method citations above but are important.	Text ∞	Be sure to include information specified in the MethodAdjustments field, as appropriate. Give a brief description of changes or adjustments to a standard method if they are NOT described in the methods documentation already provided. If multiple documentation sources are cited, be sure to indicate which method from which document was adjusted. In MonitoringResources.org, documentation of changes or adjustments to methods or protocols can be described in the Implementation Notes section of each published method or protocol. In this table, because there are no dedicated fields for metrics, this MethodAdjustments field can be used to display metric-level data. If you choose to do so, be aware that these metric-level data will be visible to all in the online query system. See note in the General Approach field above.	**ContactPersonFirst** **ContactPersonLast** **ContactPhone** **ContactEmail** MetaComments	First name of person who is the best contact for questions that may arise about this data record. Last name of person who is the best contact for questions that may arise about this data record. Phone number of person who is the best contact for questions that may arise about this data record. Email address of person who is the best contact for questions that may arise about this data record. Comments regarding the supporting information.	**Text 30** **Text 30** **Text 30** **Text 50** Text ∞	Preferred format is If an extension is i...
OtherDataSources	The ContactAgency field identifies an organization involved in calculating the values in this record. This "OtherDataSources" field identifies additional organizations that provided data or expertise to calculate the indicator(s), metric(s), or age distribution for this record.	Text 255	List all the organizations that provided data used to calculate the values for this record. Entries must meet the requirements as defined in the ContactAgency field. If more than one, separate the entries with the bar character. This field is for ADDITIONAL organizations. Do not include the organization identified in the ContactAgency field.		If you are a programmer or database manager, refer to Appendix A for additional fields that are part of this table but a...		
					Fields needed by people programm...		

	Comments about the data		
Comments	Any issues, problems, questions about this indicator that were not already captured in other places.	*Text ∞*	If possible, it is useful to briefly explain any null "metrics" or "age" fields. Required if NullRecord = "Yes", to explain why the indicators are not available.

Section B: Indicators for Hatchery Programs and Populations of Hatchery Origin Fishes

B1. PNI Table

This table stores information about proportionate natural influence (PNI) of supplementation hatcheries, which is an estimate of the relative selection pressure of the natural environment on an integrated natural / hatchery population.

(Back to Table of Contents)

Field Name	Field Description	Data Type	Codes/Conventions for the PNI Table
Fields for defining a unique record			
ID (unique)	Value used by computer to identify a record.	*GUID*	This value is a globally unique identifier (GUID) which... • When submitting a new record you may include this value or leave it blank. If you include this value then it will be used by the central system. If you leave it blank then a value will be created for you, and it will be sent back to your system where it must be incorporated. • When updating or deleting records this value must be included.
TimeSeriesID	This field identifies the time series a record belongs to. Records with the same TimeSeriesID are grouped and presented together on the CAX query systems. Assigned by data compilers or regional data assemblers as appropriate.	**Integer**	TimeSeriesID is used in several tables in this DES, in several tables in the CA hatchery DES (HatcheryReturns) and the Trend table of the StreamNet DES (where it's called "TrendID"). The same TimeSeriesID cannot be used in more than one of these tables. For records in this table with the same TimeSeriesID: • All PopID values must be the same. • All PopFit values must be the same. • The SpawningYear may NOT be repeated. If ownership of a time series is transferred between organizations, the TimeSeriesID is not changed.
CommonName	Common name of the taxon of fish.	**Text 50**	Select from the following: • Bull trout • Chinook salmon • Chum salmon • Coho salmon • Sockeye salmon • Steelhead Additional species may be added in the future: refer to https://www.streamnet.org/resources/nw-fish/fish-species/ for common names.
Run	Run of fish.	**Text 20**	Enter the name of the run here, even if run name is included in the name of the population. Entries in this field are not recognized as taxonomic divisions. Select from the following: [*Do not include comments in brackets.*] • Spring • Summer • Fall • Late fall • Winter • Spring/summer • Both summer & winter • Early • Late • Both early & late • N/A [*For species without recognized runs example, bull trout.*]

Continuation of the PNI Table field definitions:

Field Name	Field Description	Data Type	Notes
RecoveryDomain	Name of the "recovery domain," as defined by the NMFS Northwest Region, in which the population falls geographically.	Text 255	Five recovery doma... defined by NMFS i... Oregon, and Idaho. appropriate one fro...
ESU_DPS	For populations listed under the federal ESA, this is the name of a defined Evolutionarily Significant Unit (ESU) or Distinct Population Segment (DPS) as defined by NMFS Northwest Region or by USFWS in which the population falls geographically. For non-listed populations... other name.	Text 255	Enter the name of t... at the species, subsp... https://web.archive...
MajorPopGroup	Name of "major population group" (MPG) or "stratum" as defined by the NMFS Northwest Region, in which the population falls geographically.	Text 255	The term "stratum"... areas. The term "st... geographically.
PopID	Code for the population(s) of fish represented by this record.	Integer	See Appendix C if y... where it
CommonPopName	Population name used by local biologists.	Text 255	Often this is simply... with other... Acceptable values: • Same [*Estimate*... • Portion [*Estima*... • Multiple [*Estim*...
PopFit	Categorization of how well the PNI estimate corresponds to the geographic definition of the population.	*Text 8*	This value must be...
PopFitNotes	Text description of how well the PNI value corresponds to the defined population, and why the data are not at the scale of a single population.	*Text ∞*	This field is required... If the PopFit field i... which the hatchery... true population-sca... the population.")
HatcheryProgramName	Hatchery program this record describes.	Text 255	
HatcheryStockName	Stock of hatchery fish this record describes.	Text 255	
ESAlisted	Flag indicating whether the hatchery fish are part of the ESU or DPS in which the population falls geographically.	Text 3	Acceptable values: • Yes • No If you are unsure ab... https://www.federal... code-of-federal-reg...
Hatchery	Name of the hatchery or hatchery complex associated with the time series.	Text 255	This may be any of... • the name of a hat... • the name of a hat... • the names of mu... To allow for easy s... https://www.stream...

Assigned TimeSeriesID ranges are the same as assigned TrendID ranges at StreamNet DES. Coordinate with the organization assigning TimeSeriesID values.

- 10,000–19,999 = MFWP
- 20,000–22,499 = CRITFC
- 22,500–24,999 = NPT
- 25,000–27,499 = CTWS
- 27,500–29,999 = YN
- 200,000–209,999 = CTUIR
- 30,000–39,999 = USFWS
- 40,000–49,999 = IDFG
- 50,000–59,999; 500,000–599,999 = ODFW
- 160,000–169,999 = WDFW
- (GCT range jointly managed by WDFW and CCT)

Field Name	Field Description	Data Type		Field Name	Field Description	Data Type	
HatcheryProgramType	Purpose of the hatchery program this record represents.	Text 40	Acceptable values for this field are taken from Beasley, C.A., et al. 2008. Recommendations for broodstock and monitoring approaches that reduce the effects of hatchery supplementation on the fitness of natural salmon and steelhead populations. Final report from the Ad Hoc Supplementation monitoring and evaluation workgroup. Available at https://www.streamnet.org/final_draft_ahswg_2008april4/. Descriptions (in italics) are derived from the entire document as necessary. [Do not include when ContactAgency provides >1 record for that combination than 1 Yes in this BestValue field.] • Segregated harvest augmentation [Purpose is to minimize... spawning in the wild with natural origin fish.] • Integrated supplementation [Purpose is to... and natural origin fish are intentionally encouraged to interbreed in the hatchery and in the natural environment.] • Integrated supple... harvest to mitiga...	The implementation of the Compliance Monitoring section of Appendix A, chapter 5 of this document. When ContactAgency provides >1 record for that combination than 1 Yes in this BestValue field indicates this record contains the indicator value the agency recognizes as their best estimate.	Text 40	Acceptable values: • Yes (if the entity... • No (if not recogn... • Not specified Notes regarding the... 1. When only one r... 2. It is acceptable fo... 3. Different contact...
							Indicato...
SpawningYear	The four-digit year in which spawning of this species (and run where appropriate) began.	Integer	In cases where an unusual population is spawned uncharacteristically early (before January 1 for spring spawners) or late (after December 31 for fall spawners) for the species (and perhaps run), assign the year based on the majority of this species/run in order to be consistent for all members of the spawning cohort. For example, most coho spawn in fall but a few populations do not begin spawning until after Jan. 1. The spawning year assigned for these unusual populations would match the other populations that spawned in the fall, even though these particular populations did not begin spawning until after December 31.	PNI[J] Proportionate natural influence index, calculated as $pNOB/(pNOB + pHOS)$ where: • pNOB = proportion of broodstock actually spawned in hatchery that are natural origin fish. • pHOS = proportion of fish spawning naturally that are hatchery origin fish. Include jacks when calculating 'broodstock' in Glossary.)	Real	Required if the PNI... This is equation 11... Wide Report. 278 p... When calculating P... wild. Rather, weigh...
ContactAgency	Agency, tribe, or other entity, or person responsible for these data that is the best contact for questions that may arise about this data record.	Text 255	Entries in this field must precisely match a name in the StreamNet agency list. Here are the ones most likely needed here, contact your agency StreamNet representative, or call PSMFC's StreamNet staff at 503-595-3100. • Columbia River Inter-Tribal Fish Commission • Confederated Tribes of the Colville Reservation • Confederated Tribes and Bands of the Yakama Nation • Confederated Tribes of the Umatilla Indian Reservation • Confederated Tribes of the Warm Springs Reservation of Oregon	• Fish Passage Center • Idaho Department of Fish and Game • Nez Perce Tribe • Northwest Indian Fisheries Commission • Oregon Department of Fish and Wildlife • Quantitative Consultants, Inc. • Shoshone-Bannock Tribes • Spokane Tribe of Indians • U.S. Fish and Wildlife Service • Washington Department of Fish and Wildlife		Express these value... For populations for... recognized are Chi...
			PNIEJ	Proportionate natural influence index, calculated as $pNOB/(pNOB + pHOS)$	Real	Required if the PNI... This is equation 11... Wide Report. 278 p...
MethodNumber	This field represents the method(s) used to calculate the values in the "Indicators" and "Metrics" sections. This field is used in conjunction with the ContactAgency field. See the Codes/Conventions column for details.	Integer	This field, along with the "ContactAgency" field above, identifies which entity calculated the values in the record and which (or of) methods were used to calculate them. These fields allow for multiple records... each population and year. Thus, it is possible to share values that are based on different assumptions. If only one set of methods is used to calculate the values for a population, enter "1" for all records. Even if methods are changed, you can enter "1" for all records if there is always only one record per year for a population. If more than one set of methods is used... which records are m... method 2 was used to calculate values for 1980 through 2013, then there will be more than one record for the years 1980 through 1994. In such cases you would enter "1" for records that result from the 1980-1994 method, and "2" for records that result from the 1980-2013 method. Similarly, if 3 different methods are proposed in an area for the same years, then use "1" and "2"... to indicate which records belong together. This lets a data user know which records belong together. When more than one... exists for a popula... most use when conducting their day to day busin...	where: • pNOB = proportion of broodstock actually spawned in hatchery that are natural origin fish. • pHOS = proportion of fish spawning naturally that are hatchery origin fish. Exclude jacks when calculating this value.		Because jacks are n... Express these value... For populations for... Chinook salmon, c...
							Metrics supporting the "Ind...
			HOSIJ	The number of hatchery origin fish spawned in the hatchery, including jacks. (This is the same value reported in HOSIJ field of the draft HatcherySpawning table.)	Integer	"Hatchery origin" m... Provide whole num... For populations for... recognized are Chi...
			NOSIJ	The number of natural origin fish spawned in the hatchery, including jacks. (This is the same value reported in NOSIJ field of the draft HatcherySpawning table.)	Integer	This value reflects th... means the fish's par... Provide whole num... For populations for... recognized are Chi...

Field Name	Field Description	Data Type
NOSAIJ	The point estimate for natural origin spawner abundance, including jacks, spawning in the wild. (This is the same value reported in NOSAIJ field of the NOSA table for the population and year specified for the current record.)	Integer
HOSAIJ	The point estimate for hatchery origin spawner abundance, including jacks, spawning in the wild.	Integer
HOSEJH	The number of hatchery origin fish spawned in the hatchery, excluding jacks. (This is the same value reported in HOSEJ field of the draft HatcherySpawning table.)	Integer
NOSEJH	The number of natural origin fish spawned in the hatchery, excluding jacks. (This is the same value reported in NOSEJ field of the draft HatcherySpawning table.)	Integer
NOSAEJ	The point estimate for natural origin spawner abundance, excluding jacks, spawning in the wild. (This is the same value reported in NOSAEJ field of the NOSA table for the population and year specified for the current record.)	Integer
HOSAEJ	The point estimate for hatchery origin spawner abundance, excluding jacks, spawning in the wild.	Integer
Protocol and method documentation		
ProtMethName	The name(s) of all protocols and associated data collection and data analysis methods used to calculate the indicator estimate.	Text ∞
ProtMethURL	URL(s) for published protocols and methods describing the methodology and documenting the derivation of the indicator. If published in MonitoringResources.org, this link will provide access to study design information and all methods associated with the protocol.	*Text ∞*

Field Name	Field Description	Data Type	Codes/Conventions for PNI Table
MeasureLocation	Where the measurements are maintained that were used for these calculations.	Text ∞	If online, provide URL(s).
ContactPersonFirst	First name of person who is the best contact for questions that may arise about this data record.	**Text 30**	
ContactPersonLast	Last name of person who is the best contact for questions that may arise about this data record.	**Text 30**	
ContactPhone	Phone number of person who is the best contact for questions that may arise about this data record.	**Text 30**	Preferred format is "123-456-7890". If an extension is included, preferred format is "123-456-7890 ext. 34".
ContactEmail	Email address of person who is the best contact for questions that may arise about this data record.	**Text 50**	
MetaComments	Comments regarding the supporting information.	Text ∞	
Fields needed by people programming the Exchange Network			
If you are a programmer or database manager, refer to Appendix A for additional fields that are part of this table but are not listed here.			

III. Appendices

Appendix A. Fields included in every data table by reference

The fields shown in this appendix are included in all data tables of sections A and B of this document. (But not the Populations or SuperPopulations tables.) These fields are for use by the programmers implementing the Exchange Network system; everyone else can ignore them. In the interest of saving space in the document, easing editing of this document, and keeping these fields out of the way of people who don't need to see them, these fields are included here by reference rather than being shown in every table above. At this time none of these fields are required except the "SubmitAgency" and "Publish" fields.

Field Name	Field Description	Data Type	
UpdDate	The date and time that the record was created or updated. For data obtained in electronic format from another source it can reflect the date and time of data capture or of conversion to Coordinated Assessment/StreamNet standards.	Datetime	This can be the tim… modified at the sou…
DataEntry	Compiler's name.	Text 50	The name of the pe…
DataEntryNotes	Notes about this record by the compiler identified in the "DataEntry" field.	Text ∞	Notes for the com…
CompilerRecordID	Agency record ID maintained by the data submitter.	Text 36	This field can be u… Coordinated Asses…
Publish	Yes/no value indicating whether this record should be shared freely with all public users via the Exchange Network. If "No" then the record can only be accessed by using the apikey that created it.	**Text 3**	Acceptable values: • Yes [Record w… • No [Record wi… Setting this value t…

Appendix B. Glossary

Terms in this list are defined in the following way for use in this document.

Broodstock: Fish set aside for spawning in a hatchery setting. NOTE 1: Broodstock may be fish raised in a hatchery their entire lives ('captive broodstock'), fish released to grow that returned to spawn ('hatchery broodstock' for salmon and steelhead), and/or fish obtained from natural populations ('natural broodstock' or 'wild broodstock'). In hatchery jargon "hatchery broodstock" refers only to fish of hatchery origin.

NOTE 2: Broodstock selection and spawning can be complicated. Often, not all returning fish will be part of the broodstock. Also, broodstock may be brought in from other hatcheries or from natural populations. Further, in many cases not all of the identified broodstock will be spawned due to pre-spawning mortality, broodstock set-aside in excess of spawning needs, skewed sex ratio, selection of individuals, and other

Field Name	Field Description	Data Type	Codes/Conventions for Appendix A Fields	
			Fields needed by people programming the Exchange Network	
SubmitAgency	Initials or acronym for the agency, tribe, or other entity, or name of person, that sent this record of data to the exchange network node at StreamNet. Note that it is possible for one entity to share data with another, and that second entity sends the record to the exchange network node. For example, the Shoshone-Bannock Tribes may send data to IDFG, who in turn sends those data to the exchange network. In such a case the Sho-Ban Tribes would be identified as the contact agency for the data, but the "SubmitAgency" would be IDFG.	**Text 15**	Entries in this field must precisely match a name in the Acronym field of the StreamNet agency list unless it is for an individual. Here are the ones most likely needed. If yours is not found here, contact your agency StreamNet representative, or call PSMFC's StreamNet staff at 503-595-3100. • CRITFC = Columbia River Inter-Tribal Fish Commission • Colville Tribes = Confederated Tribes of the Colville Reservation • YN = Confederated Tribes and Bands of the Yakama Nation • CTUIR = Confederated Tribes of the Umatilla Indian Reservation	• CTWSIR = Confederated Tribes of the Warm Springs Reservation of Oregon • Biomark = Biomark, Inc. • FPC = Fish Passage Center • IDFG = Idaho Department of Fish and Game • NPT = Nez Perce Tribe • NWIFC = Northwest Indian Fisheries Commission • ODFW = Oregon Department of Fish and Wildlife • SBT = Shoshone-Bannock Tribes • STOI = Spokane Tribe of Indians • USFWS = U.S. Fish and Wildlife Service • WDFW = Washington Department of Fish and Wildlife
RefID	The unique StreamNet reference ID number that identifies the source document or database from which the record was obtained.	Integer	Not applicable = 98 Pre-Data Exchange - 0 - 1,000 WDFW = 10,000-19,999; 100,000-199,999 CRITFC = 20,000-29,999; 200,000-299,999 CCT = 299,001-299,999 USFWS = 30,000-39,999; 300,000-399,999	IDFG = 40,000-49,999; 400,000-499,999 ODFW = 50,000-59,999; 500,000-599,999 NPT = 60,000-69,999; 600,000-699,999 MEWP = 70,000-80,999; 700,000-799,999 CDFG = 90,000-99,999; 800,000-899,999

factors. In a simple case where only returning salmon are selected as broodstock, the broodstock is usually a subset of the total return, and the hatchery spawners are usually a subset of the broodstock.

Hatchery origin / Natural origin: "Hatchery origin" fish are those resulting from spawning in a hatchery, while "Natural origin" fish are those resulting from spawning in the natural environment. Whether the parents were hatchery origin, natural origin, or a mix does not matter.

Smolt equivalent: This term, used in the JuvenileOutmigrants table, is a way to standardize information from across different locations and juvenile fish life stages to a single location and life stage. See Appendix E for a fuller explanation of this term.

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Appendix C. Defining New Populations and "Superpopulations"

The tables in the main portion of this document ask that the species common name, run, evolutionarily significant unit (ESU), major population groups (MPG), recovery domain, and fish population code be provided whenever possible and appropriate. The current list of population names and population codes, along with their ESUs and MPGs defined by NMFS, can be found at https://www.streamnet.org/cap/current-hli/current-pop/.

MPGs are groups of populations intermediate in scope between individual populations and ESUs. MPGs are sometimes called "strata" in the Willamette/Lower Columbia recovery domain and "geographic regions" in the Puget Sound recovery area. Further information about MPGs can be found at the Northwest Fisheries Science Center web site.

To add a new population or a new "superpopulation" (a collection of populations) for use in the main HLI tables, contact StreamNet at project@streamnet.org or 503-595-3100. The following steps, more or less, will be followed. Because we want to avoid duplicates and other data problems, new populations cannot be submitted using the API.

To add a new population:

1) Fill out a record for Table C1 (Populations) as fully as possible for each new population. Leave the ID field blank for now.
   a) Along with the table, a geographic description (preferably in GIS format) for each population must be included. The RecordNote field can be used instead if a text description suffices.
   b) If the population is listed in the CRITFC "population crosswalk" at http://www.critfc.org/fish-and-watersheds/fishery-science/data-resources-for-scientists/columbia-basin-salmon-and-steelhead-crosswalk-project/, specify the name from the crosswalk in the RecordNote field. Doing this will satisfy the requirement under step 1a.
2) Submit the new record(s) to StreamNet (project@streamnet.org) and request an ID assignment for each population. Submit them as early as you can to allow spatial data QC work at StreamNet.
3) StreamNet will provide you with an ID for each population.

To add a new superpopulation (a collection of populations):

1) Use the directions above to get an ID for each population that is a component of the superpopulation, if necessary.
2) Fill out a record for Table C1 (Populations) as fully as possible for each new superpopulation. Leave the ID field blank for now.
   a) Put the superpopulation's name in the PopulationName field.
   b) No geographic descriptions or GIS data are required for superpopulations.
3) StreamNet will provide you with an ID for each superpopulation (but you can temporarily use 1, 2, 3, etc. if defining more than one superpopulation).
4) Fill out records in Table C2 (SuperPopulations) for each superpopulation.
   a) All fields are required except PopFitNotes, which is required only if PopFit = "Portion".
   b) There will be one record in SuperPopulations for each component population.
      i) For example, if a superpopulation consists of populations with ID values of 1 and 3 and 7, then there will be 3 records in the SuperPopulations table.
      ii) All 3 records for the superpopulation will have the same SuperPopID, which is the ID provided in step 3.

Table C1. Populations Table

This table stores information about populations and superpopulations. Also included is who requested each record be added. At least one of the fields that indicates a population name must be filled in.

Field Name	Field Description	Data Type	Codes/Conventions for Populations Table		
ID	StreamNet-defined code for the population (or superpopulation) of fish represented by this record.	Integer	Must be null when submitting a new record.		
PopTypeID	Code for whether the record is for a single population or a superpopulation.	**Integer**	1 = Population 2 – Superpopulation		
CommonName	Common name of the taxon of fish.	**Text 50**	Select from the following:	• Bull trout • Chinook salmon • Chum salmon • Coho salmon • Sockeye salmon • Steelhead	Additional species may be added in the future: refer to https://www.streamnet.org/resources/nw-fish/fish-species/ for common names.
Run	Run(s) of fish.	**Text 20**	Enter the name of the run here, even if run name is included in the name of the population. Entries in this field are not recognized as taxonomic divisions. Select from the following: [*Do not include comments in brackets.*]	• Spring • Summer • Fall • Late fall • Winter • Spring/summer	• Both summer & winter • Early • Late • Both early & late • N/A [*For species without recognized runs. For example, bull trout.*]

Field Name	Field Description	Data Type	Codes/Conventions for Populations Table		
RecoveryDomain	Name of the "recovery domain," as defined by the NMFS Northwest Region, in which the population falls geographically.	Text 255	Five recovery domains have been defined by NMFS in Washington, Oregon, and Idaho. Select the appropriate one from this list:	• Puget Sound • Willamette/Lower Columbia • Interior Columbia • Oregon Coast • Southern Oregon/Northern California Coast	Further information about recovery domains can be found at https://web.archive.org/web/2016121521 4935/http://www.nwfsc.noaa.gov/trt/.
ESU_DPS	For populations listed under the federal ESA, this is the name of a defined Evolutionarily Significant Unit (ESU) or Distinct Population Segment (DPS) as defined by NMFS Northwest Region or by USFWS. For non-listed populations this is the DPS or other name.	Text 255	Enter the name of the ESU or DPS here. Entries in this field are taxonomic divisions defined by NMFS or USFWS, and may be at the species, subspecies, or finer scale. ESUs of salmon north of California are listed at https://web.archive.org/web/20161215214935/http://www.nwfsc.noaa.gov/trt/.		
MajorPopGroup	Name of "major population group" (MPG) or "stratum" as defined by the NMFS Northwest Region, in which the population falls.	Text 255	The term "stratum" is used in the Willamette/Lower Columbia Recovery Domain, while "major population group" is used in other areas. The term "stratum" includes life history considerations as well as geographic criteria, while MPGs are defined geographically.		
PopulationName	Name of the population (or superpopulation).	Text 100	Follow the formula for names already in use for other populations/superpopulations. https://www.streamnet.org/cap/current-hli/current-pop/		
ContactAgency	Agency, tribe, or other entity that requested this population be added to the list.	**Text 255**	Entries in this field must precisely match a name in the StreamNet agency list. Here are the ones most likely needed. If yours is not found here, contact your agency StreamNet representative, or call PSMFC's StreamNet staff at 503-595-3100. • Columbia River Inter-Tribal Fish Commission • Confederated Tribes of the Colville Reservation • Confederated Tribes and Bands of the Yakama Nation • Confederated Tribes of the Umatilla Indian Reservation • Confederated Tribes of the Warm Springs Reservation of Oregon	• Fish Passage Center • Idaho Department of Fish and Game • Nez Perce Tribe • Northwest Indian Fisheries Commission • Oregon Department of Fish and Wildlife • Quantitative Consultants, Inc. • Shoshone-Bannock Tribes • Spokane Tribe of Indians • U.S. Fish and Wildlife Service • Washington Department of Fish and Wildlife	
RecordNote	Information about the record.	Text 255	For superpopulations, describe why it exists – why the specific list of component populations was selected; the superpopulation's original purpose; and which data types are expected to use the superpopulation.		
UpdDate	The date and time that the record was created or updated. For data obtained in electronic format from another source it can reflect the date and time of data capture or of conversion to Coordinated Assessment/StreamNet standards.	**Datetime**	This can be the time a record was created, or the last time it was edited. This field tells the end user when the record was last modified at the source organization.		

Table C2. SuperPopulations Table

This table lists the individual component populations which, when combined, define a superpopulation. The records with the same SuperPopID all belong to the same superpopulation. Both the SuperPopID and the PopID of each component population must already exist with an "ID" value in the Populations table before this table can be filled.

Field Name	Field Description	Data Type	Codes/Conventions for SuperPopulations Table	
SuperPopID	StreamNet-defined code for the superpopulation.	**Integer**	Foreign key to the Populations table's ID field. This value must already exist in the Populations table before being used here.	
PopID	StreamNet-defined code for a component population.	**Integer**	Foreign key to the Populations table's ID field. This value must already exist in the Populations table before being used here.	
PopFit	Categorization of how well the geographic extent of the data corresponds to the geographic definition of the component population.	**Text 8**	Acceptable values: [*Do not include comments in brackets.*] • Same [*Represents one entire population, the whole population, and nothing but the population.*] • Portion [*Represents a portion of one population. (Describe in PopFitNotes field.)*]	
PopFitNotes	Text description of why only part of the component population is included in the superpopulation.	*Text ∞*	This field is required if the PopFit field is "Portion". If the PopFit field is "Portion" describe the lack of correspondence between the whole component population and that part of it that is part of the superpopulation.	
ContactAgency	Agency, tribe, or other entity that requested this population be added to the list.	**Text 255**	Entries in this field must precisely match a name in the StreamNet agency list. Here are the ones most likely needed. If yours is not found here, contact your agency StreamNet representative, or call PSMFC's StreamNet staff at 503-595-3100. • Columbia River Inter-Tribal Fish Commission • Confederated Tribes of the Colville Reservation • Confederated Tribes and Bands of the Yakama Nation • Confederated Tribes of the Umatilla Indian Reservation • Confederated Tribes of the Warm Springs Reservation of Oregon	• Fish Passage Center • Idaho Department of Fish and Game • Nez Perce Tribe • Northwest Indian Fisheries Commission • Oregon Department of Fish and Wildlife • Quantitative Consultants, Inc. • Shoshone-Bannock Tribes • Spokane Tribe of Indians • U.S. Fish and Wildlife Service • Washington Department of Fish and Wildlife
UpdDate	The date and time that the record was created or updated. For data obtained in electronic format from another source it can reflect the date and time of data capture or of conversion to Coordinated Assessment/StreamNet standards.	**Datetime**	This can be the time a record was created, or the last time it was edited. This field tells the end user when the record was last modified at the source organization.	

Appendix D. NOSA/Escapement Decision Tree

Line colors: Blue=Go to next decision point; Green=An escapement estimate is called for; Yellow=A NOSA estimate is called for.

Coordinated Assessments
Spawner Abundance (SA)
and Escapement (ESC)
Decision Tree
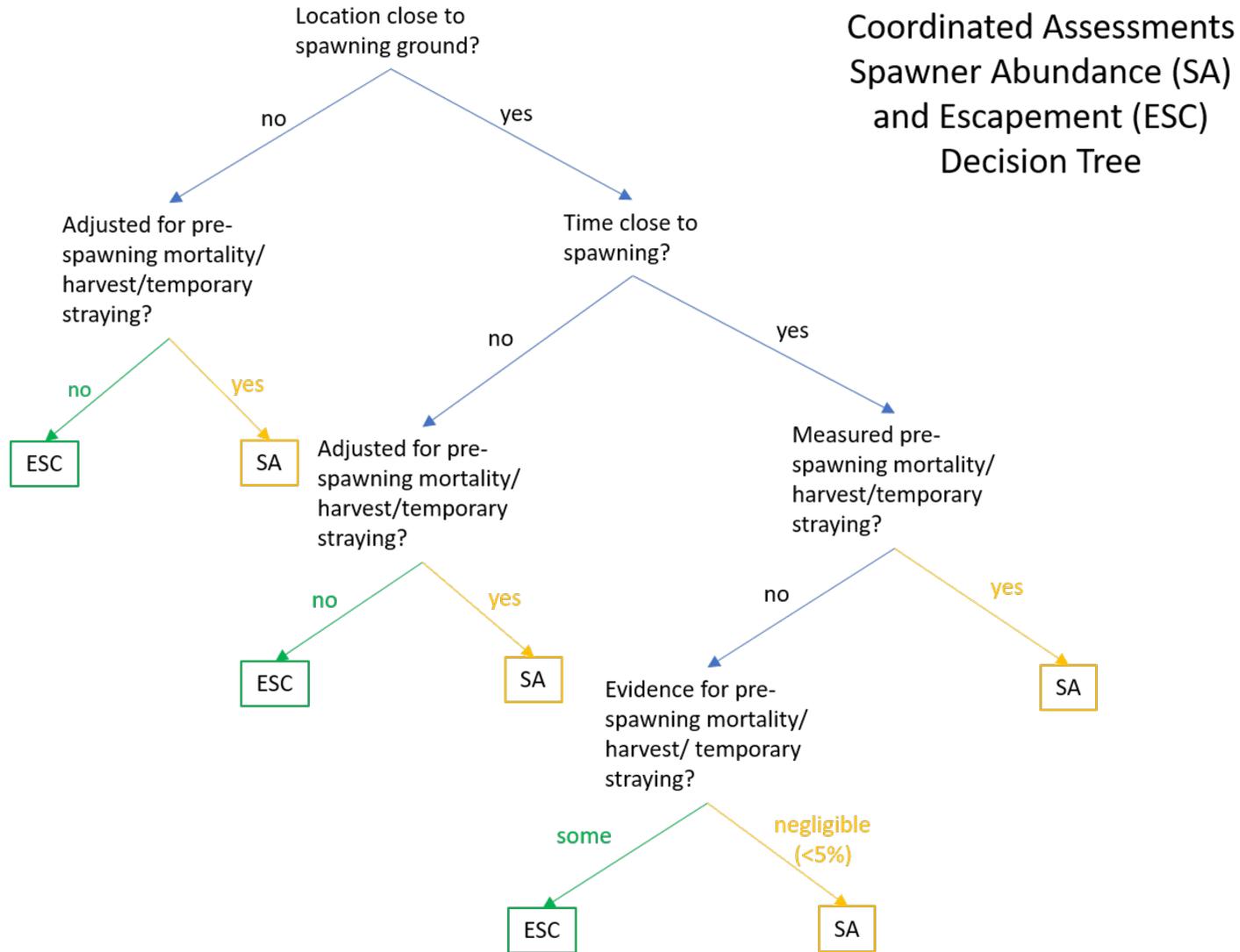
Appendix E. An Explanation of the Term "Smolt Equivalents" As Used By the Coordinated Assessments Partnership

"Smolt equivalents", a term used in the JuvenileOutmigrants table, is a concept used to standardize outmigrant numbers from one or more locations and/or juvenile life stages to a single location at the smolt life stage.

The simplest example is an estimate made within a population's boundaries for just the smolts at one trap. Umatilla River steelhead juvenile monitoring at Threemile Falls Dam is an example – emigrant numbers are estimated using a trap at the juvenile bypass facility on the dam. In this case all emigrants passing the trap are considered smolts due to the migration timing, location of the trap, and physical evaluation of juveniles for smolt characteristics at the juvenile bypass facility. No special "smolt equivalent" estimation is performed because the emigrants are all considered smolts.

A more complex example, where the "smolt equivalent" concept becomes useful, is sampling fish within a population but generating a smolt numbers estimate downstream of the sampling site. IDFG estimates the number of Chinook salmon smolts each year from the South Fork Salmon River (SFSR) in central Idaho. If all these fish overwintered in the SFSR and smolted during a brief springtime period, then IDFG could estimate the number of smolts on their way downstream in the spring and provide a juvenile outmigrant estimate for the population as they leave the SFSR, as is done for the Umatilla River steelhead. But the majority of Chinook salmon leave the SFSR during the summer and fall as parr, rather than as smolts the following spring. Because of this protracted migration period, if IDFG is to produce a complete estimate of the number of juvenile outmigrants then they must capture parr on their way downstream in the summer and fall, as well as smolts during the following spring. This reality of field sampling dictated by the life history of the fish introduces a new need: because mortality is a continuous process, IDFG cannot simply add the number of summer parr + fall parr + spring smolts. Rather, an end point must be defined, and a survival rate to that end point must be applied to each of these groups if their numbers are to be added. If we define the end point as the smolt stage, then:

    (Summer parr) * (Summer parr survival rate to smolt stage)
+ (Fall parr) * (Fall parr survival rate to smolt stage)
+ (Spring smolts) * 1.0   [Because they are already smolts, survival to smolt stage is 100%.]
= Final smolt estimate

The "Final smolt estimate" in the equation above is the "Smolt equivalents", and the data may look like this:

$$100,000 * 0.2$$
$$+ 200,000 * 0.34$$
$$+ 10,000 * 1.0$$
$$= 98,000 \text{ smolt equivalents}$$

The word "equivalents" is used because the 100,000 summer parr, due to their 20% survival rate to the smolt stage, are equivalent to only 20,000 smolts – a 5:1 ratio. Similarly, it takes roughly 3 fall parr to yield one smolt. Smolts, on the other hand, are already smolts and thus are not discounted.

The example above is a simplification. In reality, IDFG sets the end point for this population as "smolts at Lower Granite Dam" because that is where tagged fish are detected. (ODFW has a similar method for estimating Grande Ronde River population estimates to Lower Granite.) They therefore need to estimate the number of fish in each group (summer parr, fall parr, and spring smolts, based on trap data) and the survival rate of each group to Lower Granite (based on PIT tag data). Here are IDFG's actual data for outmigration year 2018. The value in the lower right (48,198) is the estimated smolt equivalents for that outmigration year.

Capture season	Emigrant abundance at trap	Survival to LGR	Smolt abundance at LGR
Summer 2017	55,935	0.23	12,865
Fall 2017	117,507	0.28	32,902
Spring 2018	5,403	0.45	2,431
TOTAL	**178,845**		**48,198**

While calculations can be more complicated for other sampling situations, or species such as steelhead with more variable life histories, the basic "smolt equivalent" concept is the same: accounting for survival rates to the smolt stage at a specific location.

In this example, 48,198 is the HLI for this year. The "metrics" used to calculate that HLI value are the individual abundance measures and the survival rates. To share these metrics, if desired, use the JuvenileOutmigrantsDetail table.

One final note: Many trapping operations capture "transitional" or "presmolt" fish that are not quite fully smolted, but the researchers include them in the number of smolts. In such cases you would include that information in the methods, but there is no need to try to slice and dice life stages more finely than how you already analyze your data.

Appendix F. Data Types Used in the Data Tables

Data Type[1]	Purpose	Characteristics
Date	Dates	
DateTime	Dates and time	This data type stores date <u>and</u> time -- it is not possible to store one without the other. A date with no time is usually interpreted as 00:00 in the morning. A time with no date may be interpreted differently by different software packages. Calculations recognize and use these default values, so must be accounted for when using the data.
GUID (globally unique identifier)	Unique values to identify a record	A text string of exactly 36 hexadecimal characters displayed in five groups separated by four hyphens, in the form 8-4-4-4-12.
Integer	Whole numbers, both positive and negative	Integers only: no decimal places.

Real[2]	Numbers with decimals	While "real" numbers in mathematics include irrational numbers such as pi, e, and square roots, for our needs "real numbers" include only the rational numbers.
Text	Text strings (Includes numbers not used in calculations.)	Variable length entries usually allowed. Maximum length is indicated for each field, with "∞" indicating essentially no upper limit.

[1]Fields of types 'Byte', 'Integer', and 'Long int' in the previous DES version map to "Integer" in this version; 'Single' and 'Double' map to "Real"; 'Text' and 'Memo' map to "Text" except for GUID values, which map to "GUID"; 'DateTime' maps to "Date" or "DateTime", depending on whether time is included in the values.

[2]The word "Real" was selected rather than "Decimal" for a practical reason: it is visually easier to distinguish from "Integer".