

captrends.csv metadata

Field	Description	Data type
DataTableID	Unique numerical code for each population trend record. Matches with tables: ts_abundance.csv, ts_change.csv, direction.csv.	Character
Species_corrected	Binomial species name following IUCN taxonomy, but with adjustment so populations that have been reclassified according to recent IUCN (as of 2022) range maps now represent the most recent species name e.g. when Canis aureus were recorded across Africa, these were changed to represent newly recognised Canis lupaster.	Character [populated from file: metadata_taxonomy]
Species_reported	Binomial species name following IUCN taxonomy	Character [populated from file: metadata_taxonomy]
Sub_species	Subspecies as listed within the source	Character
IUCN_id	Unique species identifier used by the IUCN	Numeric
Citation_key	Unique alphanumeric code for each source to match with table sources.csv	Character
Spatial_locality	If papers have trends split into different sites, each site is given its own spatial unique numerical code	Numeric
Temporal_locality	If papers have trends split into different time points (e.g. 1980 - 1990, and 1990 - 2000), each consecutive time series is given its own temporal numerical code	Numeric
Locality_name	Name of study site as described in the primary source	Character
Singular_country	Country where studied population occurs following ISO3166 naming standards as of 2018 (e.g. source mentions Soviet Union and coordinates indicate Russia, Russia was recorded).	Character [populated from file: metadata_countries]
Multiple_countries	When studied population overlaps multiple countries, each country is included in a list separated with semi-colons. Country names follow ISO3166 standards.	Character [populated from file: metadata_countries]
Wider_population	Further information about the study site e.g. name of the region, state or national park.	Character
Locality_area	Numeric estimate of the study site area	Numeric
Locality_area_units	Units in which area of study site 'Locality_area' is reported. Categories: <u>Km²</u> : Area where the population was studied (recorded in square kilometres) <u>Missing values represent no units or area value were provided</u>	Categorical
Study_year_start	Year of first population size estimate	Numeric
Study_year_end	Year of final population size estimate	Numeric
Field_method	Field method for deriving population size estimates or demographic information. Categories: <u>Individuals identified</u> : All individuals of a population were identified. <u>Systematic – direct</u> : Monitoring approach is systematic (not-opportunistic), is not clearly prone to spatial or temporal bias, and involves direct observations of the animal (either alive or dead) e.g. through camera-trap grids or road-transects. <u>Systematic – indirect</u> : Monitoring approach is systematic (not-opportunistic), is not clearly prone to spatial or temporal bias, and involves indirect observations of the animal e.g. footprint, audio calls, fur traps. <u>Systematic -undefined</u> : Monitoring approach is systematic (not-opportunistic) and is not clearly prone to spatial or temporal bias but the actual method of making observations is unclear or a mix of direct and indirect.	Categorical

Unsystematic – direct: Monitoring approach is opportunistic or not completely systematic and is at least partially prone to spatial or temporal bias; also involves direct observations of the animal (either alive or dead) e.g. through camera-trap grids or road-transects.

Unsystematic – indirect: Monitoring approach is opportunistic or not completely systematic and is at least partially prone to spatial or temporal bias; also involves indirect observations of the animal e.g. footprint, audio calls, fur traps.

Unsystematic - undefined: Monitoring approach is opportunistic or not completely systematic and is at least partially prone to spatial or temporal bias; also the actual method of making observations is unclear or a mix of direct and indirect.

Undefined: Population monitoring method poorly defined or does not meet one of the above criteria.

Modelling_method	Analysis method for deriving population estimates or demographic information. Categories: <u>Model derived abundance/density:</u> Statistical model used to convert field data into population abundance or density estimates. <u>Model occupancy:</u> Statistical model used to convert occupancy field data into population abundance or density estimates. <u>Matrix modelling:</u> Statistical model to estimate population change using demographic parameters. <u>Total count:</u> Total population size is known, no need for statistical inference of abundance. <u>Relative abundance:</u> Statistical approach to control for different sampling effort in detection events e.g. relative abundance. <u>Field values:</u> Raw field data presented, no statistical modelling used to control for differences in sampling effort, observers etc. <u>Undefined:</u> Approach for estimating population size is unclear or not explained, or does not clearly fall into any other category.	Categorical
Population_metric	Type of population size measurement. Categories: <u>Abundance:</u> Estimates of the number of individuals in the population. <u>Density:</u> Estimate of the number of individuals per unit of area. Units defined by variable 'Density_scale'. <u>Other:</u> Estimate of the population size in alternate units e.g. relative abundance.	Categorical
Density_scale	Units of population_metric when reported as <u>Density</u> .	Character
Population_start	Population size estimate in the first recorded year (as listed in field 'Study_year_start'). Type of estimate described in field 'Population_metric'	Numeric
PS_dispersion_estimate	Estimate of dispersion or uncertainty in the population size value provided in field 'Population_start'. Values entered here when they are provided as single estimate (e.g., SE or SD) Type of estimate described in field 'PS_PE_dispersion_description'	Numeric
PS_dispersion_lower	Estimate of dispersion or uncertainty in the population size value provided in field 'Population_start'. Values entered here when they are provided as a lower bounded estimate (e.g., range or confidence intervals) Type of estimate described in field 'PS_PE_dispersion_description'	Numeric
PS_dispersion_upper	Estimate of dispersion or uncertainty in the population size value provided in field 'Population_start'. Values entered here when they are provided as an upper bounded estimate (e.g., range or confidence intervals) Type of estimate described in field 'PS_PE_dispersion_description'	Numeric
Population_end	Population size estimate in the last recorded year (as listed in field 'Study_year_end'). Type of estimate described in field 'Population_metric'	Numeric
PE_dispersion_estimate	Estimate of dispersion or uncertainty in the population size value provided in field 'Population_end'. Values entered here when they are provided as single estimate (e.g., SE or SD) Type of estimate described in field 'PS_PE_dispersion_description'	Numeric
PE_dispersion_lower	Estimate of dispersion or uncertainty in the population size value provided in field 'Population_end'. Values entered here when	Numeric

	they are provided as a lower bounded estimate (e.g., range or confidence intervals) Type of estimate described in field 'PS_PE_dispersion_description'	
PE_dispersion_upper	Estimate of dispersion or uncertainty in the population size value provided in field 'Population_end'. Values entered here when they are provided as an upper bounded estimate (e.g., range or confidence intervals) Type of estimate described in field 'PS_PE_dispersion_description'	Numeric
PS_PE_dispersion_description	Type of dispersion or uncertainty estimate(s) in population size values. Categories: <u>SD</u> : Standard deviation. <u>SE</u> : Standard error. <u>Range</u> : Minimum and maximum estimates. <u>90% CI</u> : 90% confidence intervals. <u>95% CI</u> : 95% confidence intervals. <u>Bayesian 90% CI</u> : 90% credible intervals derived through Bayesian sampling.	Categorical
Quantitative_trend	Numerical estimate of change in population size. Type of estimate described in field 'Quantitative_method'.	Numeric
Quantitative_method	Type of population trend metric provided in field 'Quantitative_trend'. Categories: <u>Manual calculation required</u> : complete time series available in the table [timeseries.csv]. Data fall into two categories: 1) estimates of abundance at different time points. 2) Estimates of change in abundance (e.g. population lambda, or percent change) at different time points. See metadata: timeseries.csv for more detail. <u>Lambda</u> : finite rate of population change (lambda=1 represents a stable trend). Lambdas were estimated using different methods including ratio of abundance between two time intervals (N_{t+1}/N_t), different demographic models, or as the exponential of an R-trend coefficient. <u>R-trend</u> : instantaneous rate of population change. Values were calculated with different methods but most frequently using a log-regression model of population size (R-trend = 0 represents a stable trend). <u>Percentage change</u> : change in population size between two time points (100 is stable) [formula = $(N_{t+1}/N_t) * 100$]. <u>Fold change</u> : change in population size between two time points (1 is stable) [formula = (N_{t+1}/N_t)]. <u>Qualitative only</u> : only a verbal description of population change was available.	Categorical
Other_quantitative_descriptor	Additional notes and comments about the quantitative descriptor extracted during data compilation to explain less-clear cases.	Character
Dispersion_description	Type of estimate of dispersion or uncertainty provided for the population trend metric. Estimate of dispersion provided in field 'Dispersion_estimate'. Categories: <u>VAR</u> : Variance. <u>SD</u> : Standard deviation. <u>SE</u> : Standard error. <u>Range</u> : Minimum and maximum estimates. <u>90% CI</u> : 90% confidence intervals. <u>95% CI</u> : 95% confidence intervals. <u>Bayesian 90% CI</u> : 90% credible intervals derived through Bayesian sampling.	Categorical
Dispersion_estimate	Estimate of dispersion or uncertainty for population trend (provided in field 'Quantitative_trend' field). Type of uncertainty/dispersion described in field 'PS_PE_dispersion_description'	Numeric
Dispersion_lower	Estimate of lower bound dispersion or uncertainty (e.g., confidence intervals or range) for population trend (provided in field 'Quantitative_trend'). Type of uncertainty/dispersion described in field 'Dispersion_description'	Numeric
Dispersion_upper	Estimate of upper bound dispersion or uncertainty (e.g., confidence intervals or range) for population trend (provided in field 'Quantitative_trend'). Type of uncertainty/dispersion described in field 'Dispersion_description'	Numeric

Significance_reported	Descriptor of whether statistical significance in population trend was tested. Categories: <u>NA</u> : not reported or not relevant. <u>Yes</u> : test statistic and/or significance level reported.	Categorical
Test_statistic	Value of the statistic (e.g. z, t, or F value) used to describe significance in population trend when available.	Numeric
Significance	P-value associated to the 'Test_statistic' used to describe significance in population trend when available.	Numeric
Significant_trend	Binary descriptor of whether, if statistically tested, the population trend was found to be significantly increasing or declining. Categories: <u>TRUE</u> : trend was significant. <u>FALSE</u> : trend was not-significant	Categorical
Time_lapse	Timeframe (in years) at which Quantitative_trend should be interpreted e.g. a 10-year study may describe the annual finite rate of change (lambda), as its annual the Time_lapse would equal 1. However, some lambda's are measured at 0.5 year or 10 year scale, so the metric is used to scale the Quantitative_trend to a standard time-frame. This value equals NA when the Quantitative_method is Qualitative only or a Manual trend estimate.	Numeric
Qualitative	Verbal description of population change as provided by the primary sources/publications. Categories: <u>Increase</u> : trend described as increasing, or recovering, or something synonymous. <u>Stable</u> : trend described as stable or exhibiting no population change, or something synonymous. <u>Decrease</u> : trend as described decreasing, declining, or reducing, or something synonymous. <u>Varied</u> : trend described as showing both increases and decreases at different time periods, but crucially, the first and the last population estimates are similar.	Category
N_observations	Number of population size estimates used to derive the trend - the minimum value is 2. For matrix models, this value represents the number of sampling years, rather than the number of population size estimates.	Numeric
Population_trend	Estimated instantaneous rate of change (r_t) for each quantitative trend. As quantitative trends were reported in a variety of ways, we conducted the following conversions: 1) Finite rate of change $r_t = \log_e(\lambda)$ Where λ represents the mean annual finite rate of change, recorded as 'Lambda' in the "Quantitative_method" field. 2) Estimates of relative abundance change between two points in time (e.g. percentage or fold change in the past 10 years) $r_t = \frac{\log_e(1 + (P/100))}{N}$ Where P represents the additive percentage change (e.g. a population doubling in size = 100%), and N is the difference in time (in years) between the two estimates of abundance. For fold changes, we first converted the fold change into an additive percentage change. 3) For timeseries of abundances (population estimates), we fitted log-linear regressions with abundance and year, extracting the slope coefficient. 4) Timeseries of population change estimates, reported as either population lambdas or percentage changes e.g. in year 1 the population doubled ($\lambda = 2$) and in year 2 it halved ($\lambda = 0.5$). We back-converted the change estimates into abundance estimates against a constant	Numeric

value of 100. We then fitted log-linear regressions with abundance and year, as in the abundance timeseries.

	Qualitative trends are left as missing values.	
Trend_variance	Describes the variance of annual instantaneous trend. We only report this variance from options 3 and 4 above, where the variance simply represents uncertainty around the slope of abundance through time.	Numeric
Other_driver_of_trend	Factors described in source as influencing population trends but which could not be captured by threat or conservation actions schema	Character
Comment	Additional notes and comments extracted during data compilation.	Character
Possible_issues	Description of issues that may limit use or interpretation of the trend e.g. author may describe the trend estimate as inaccurate.	Character
Genetic_data	Binary descriptor of whether the population trend was derived from genetic information. Categories: <u>1</u> : yes <u>NA</u> : no	Numeric-binary
Harvest_data	Binary descriptor of whether the population trend was derived from harvest information e.g. number of individuals hunted. Categories: <u>1</u> : yes <u>NA</u> : no	Numeric-binary
Invasive_species	Binary descriptor of whether the studied population was non-native to the study site. Categories: <u>1</u> : yes <u>NA</u> : no	Numeric-binary
Record_labelled_inaccurate	Binary descriptor of whether the population trend was described as inaccurate in the source. Categories: <u>1</u> : yes <u>NA</u> : no	Numeric-binary
Asymptotic_growth	Binary descriptor of whether the population trend described asymptotic or observed growth. Categories: <u>1</u> : yes <u>NA</u> : no	Numeric-binary
Metric_unusual	Binary descriptor of whether the population trend was reported in an unconventional way. Categories: <u>1</u> : yes <u>NA</u> : no	Numeric-binary
Peer_review	Binary descriptor of whether the source has been published after peer-reviewed. Categories: <u>1</u> : no <u>NA</u> : yes	Numeric-binary
Date_missing	Binary descriptor of whether any of the date values are missing (Study_year_start or Study_year_end). Categories: <u>1</u> : yes <u>NA</u> : no	Numeric-binary
Latitude	Latitudinal centroid in decimal degrees of the study site/population	Numeric
Longitude	Longitudinal centroid in decimal degrees of the study site/population	Numeric
Source	Source of the coordinates. Categories: <u>Georeferenced – automatically</u> : obtained from OpenCage georeferencer using locality name and country from the source. <u>Georeferenced - manually adjusted</u> : obtained from OpenCage georeferencer using locality name and country, but coordinates were inaccurate so were manually corrected. <u>Within study - calculated centroid</u> : Coordinates included in the source as extent ranges from which the centroid was calculated. <u>Within study - reported centroid</u> : centroid reported in the source.	Categorical
Coordinate_comment	Process for reviewing coordinates that were georeferenced. Categories:	Categorical

Checked - location is approximate: georeferenced coordinates were checked and the precise location could not be found. Coordinates approximated manually.

Checked - Location refined: georeferenced coordinates were checked and the deemed inaccurate, so were manually adjusted.

Checked - Original is robust: georeferenced coordinates were checked and deemed robust.

Not checked - Record appears robust: georeferenced coordinates had high a confidence value (greater than or equal to 7) and so were not checked.

NA – coordinates not checked as they were extracted from the primary source.

LPD_link	Unique identifier to link CaPTrends to their duplicates in the Living Planet database. The identifier describes the Living Planet databases trend id.	Numeric
LPD_citation	The LPD_link reference to the primary literature.	Character