

New Zealand Freshwater Fish Database Help File

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Introduction to the New Zealand Freshwater Fish Database

Brief overview

The New Zealand Freshwater Fish Database (NZFFD) is a Nationally Significant Database (MBIE, 2021). It is an archive of freshwater fish observations that contains over 50,000 freshwater fish sampling records. Data stored in each record include the location of the sample site, sampling method and the fish species present, with many records also containing information on fish abundance, size, habitat, and a physical description of the site. Data from the River Environment Classification (REC) has also been linked to the NZFFD, adding further environmental information to each NZFFD record.

Records are contributed voluntarily by people from many different groups including NIWA, the Department of Conservation, regional councils, environmental consultants, universities, Fish and Game, crown research institutes, schools, iwi groups and members of the public.

The webpages accessed via nzffdms.niwa.co.nz comprise the online download and data entry system for the NZFFD where you can freely access data and can enter your own records. Submitted records are reviewed by a database administrator before being uploaded to the database.

History and purpose of the NZFFD

The NZFFD was created by the Fisheries Research Division (FRD) of the Ministry of Agriculture and Fisheries (MAF) in 1977 (McDowall and Richardson 1983). There was concern about the loss of valuable historic fish information, particularly distributional information, due to the lack of a centralised, computer-based archive. To prevent this data loss, and to standardise the recording format, a computer-based system was established to store large volumes of data and allow its rapid retrieval.

Paper data recording cards were originally created in 1977 to capture a wide range of information on distribution, habitat characteristics and the species captured. Historic data from the FRD and various museum collections were entered into the system using the format of the data recording cards. FRD field staff were instructed to use these cards while undertaking fieldwork, to ensure the systematic recording of information. These cards were also provided to other institutions to encourage the standardisation of data collection across New Zealand fisheries researchers. The use of these cards greatly facilitated the entry of data into the new computer-based system.

The NZFFD has undergone several upgrades since it was created. The first upgrade was in the late 1980s, after an external reviewer noted that the usefulness of NZFFD data for analytical purposes was limited by a lack of quality control on entries, an absence of categorical descriptors (e.g., predefined substrate size classes), and the incompleteness of the data (most data recorded on the paper cards was not entered into the computer system) (Richardson 1989). The transfer of the database to the Empress database management system in 1988 helped to facilitate the suggested changes suggested by the reviewer. NIWA became the custodian of the NZFFD in 1995 when MAF was amalgamated. Since then, the database has been moved from Empress to the PostgreSQL database system and a web-based interface has been added. A number of other changes to fields, data entry systems and data quality control protocols have also been made.

Several decades on from the establishment of the NZFFD, the original objectives of the database are still relevant; the database aims to provide a centralised system to store information, primarily data pertaining to freshwater fish species distributions, in a standardised way.

Changes made in 2021

Rationale behind updates

The updates completed in 2021 to the NZFFD have been made to:

Reduce redundancy and improve consistency of data ingestion

- The new NZFFD is no longer compatible with the Fish Assistant software. Data import via Fish Assistant duplicated fields within the database and resulted in two different channels of data QA/QC for the same information. To improve the effectiveness and efficiency of data management, NIWA will not be managing the NZFFD to support functionality of third-party software.
- We have reduced the number of fields, removing redundant fields (fields that duplicate information already captured, complicating the database) and/or fields that contain ambiguous and/or subjective information of little scientific value in a large database (e.g. 'Predominant invertebrate' that was observed). All fields that were removed contained very little data (<5% of records contained data within most of these redundant fields).
- Certain fields of the previous NZFFD contained redundant/duplicated values in their drop-down lists. These values have been removed.

Improve data quality and clarity of interpretation

- The previous version of the NZFFD had built-in autofill for some field values, which seemed convenient, but introduced potential for errors in the database (e.g. autofill date and time to date-time of data entry, rather than date-time of sample collection). Problematic autofill values have been changed to manual fill.
- The previous NZFFD permitted entry of data in ways that resulted in database catch data having different and/or ambiguous units across records and/or users. The architecture of the 'catch data' tab has been redesigned to ensure consistency of catch data units and ease of interpretation.
- The previous version of the NZFFD website contained some ambiguous field descriptors and consequently a significant amount of time was historically invested in correcting values in these fields prior to record approval. Field labels and descriptions have been clarified. We have added descriptions for a broader range of fields on the ingestion portal to reduce ambiguity.
- Some fields allowed the use of characters that are detrimental within a database and csv download files (e.g., carriage returns). The introduction of character restrictions in the new website will reduce the number of errors and time spent on QC of records.

Expand the options for data download, and updated the download format consistent with best practice in data science

- The previous NZFFD permitted a single spreadsheet download option, which contained only a small subset of the NZFFD fields. To obtain all fields users had to request the data from NIWA. Users now have the option of downloading just the essential fields, or all the data.
- The download format is now in a relatively tidy format¹, ready for rapid wrangling and tidying by experienced data analysts/technicians.

¹ Wickham, H. 2014. Tidy Data. *Journal of Statistical Software*, 59(10), 1–23.
<https://doi.org/10.18637/jss.v059.i10>

Improve logical structure of data ingestion and storage

- The architecture of data tabs—and the fields within those tabs—has been redesigned to improve the logical structure of data entry and storage, with the anticipated outcome of ease of use and reduced errors in data entry.

Note: NO EXISTING DATA HAS BEEN LOST. For fields where the accepted values have changed, a new field has been created and data has been extracted from the old field and converted into a new set of values. All original values remain in the original field but will no longer be visible on the website or download files. Likewise, fields that are no longer in use are simply hidden from the website and download files, but these data still exist in the database.

Future updates

An Excel spreadsheet upload option is currently being investigated. Although upload of Excel spreadsheet data is convenient for the party uploading data, it creates a considerable amount of work for NIWA, who would have to develop an entirely new channel of data QA/QC for spreadsheet-based ingestion. Spreadsheets could be developed whereby cells under various fields could only be entered using drop-down lists—thus ensuring data quality/consistency — but the efficiency gains from this form of data ingestion may be marginal. A cost-benefit analysis of spreadsheet-based data ingestion needs to be conducted.

Downloading data

You do not need to register for an account to download data. Data can be freely downloaded from the database search page (nzffdms.niwa.co.nz/search).

Download file options

There are two file options available for download: 'all' and 'essential' (both are .csv). All data that are entered into the current website version are available in the 'all' file (except for senior observer name). The 'essential' file contains a selection of fields that will be sufficient for those wishing to plot species distributions spatially and over time. This option has been created to provide users with a smaller file as some may find the 'all' file too large and cumbersome, especially as the size of the database increases over time.

The search webpage allows users to filter data by searching for and downloading records that meet certain criteria, for example, records within a particular catchment or year.

Note: some users have difficulty obtaining records using the fields on the search webpage. If you think there should be records present within your search criteria, but the search is returning empty csv files, the best option is to download either the 'all' or 'essential' file with all search fields empty and filter the records with Excel.

NZFFD versions

The NZFFD has undergone structure changes on a number of occasions, resulting in some differences in data formats between versions. Each version of the NZFFD contains some different fields and different sets of values for some fields. To enable better interpretation of data, the data format version for each record is provided in the 'all' download file:

- Version 1 (V1): Format of Empress database. Records were originally entered manually into Empress and later via the Fish Assistant app. Fish Assistant app records were also uploaded to

the database via the previous website (2014–October 2021). Note that all earlier (1977–1988 records) were converted to V1 format when the database was moved to Empress.

- Version 2 (V2): Format of database after moving to PostgreSQL system, as entered via the previous webpages (2014–Oct 2021).
- Version 3 (V3): Current version of NZFFD (PostgreSQL), created October 2021.

Newer versions of the database use different values in some fields (e.g., sampling method). Where these older values cannot be converted into the new set of values, the deprecated values will remain in the database and download files. See Appendix Table B for a list of deprecated values.

Notes and tips for data analysis

All users of the NZFFD data should consider the limitations of the data and be aware of these when they are utilising the data in analyses and reports. Data have not been collected in a standardised manner using agreed methods and approaches, which will lead to different species being targeted and habitats being sampled. The database does contain some limitations and errors which are described below (note that this is not an exhaustive list).

Date

Dates of 1st Jan or 1st of any month may not be the true date of the record. The web-based data entry system requires day is entered as part of a date, and if the day is not known, most users will select 1 as a default option. Similarly, if month is not known, January may be selected as a default month. Affects V2 and V3 data, possibly also V1 data.

Physical and chemical site descriptors

There may be some values entered using the wrong units (e.g., depth sampled entered in centimetres instead of metres). NZFFD admin will correct these when they are obvious errors, but some such errors are not immediately obvious. For example, a user could enter a depth of 1 which the NZFFD admin would assume matches with the units in the format (metres), but this was actually a measurement in cm.

For V1 and V2 records the ‘maximum depth’ field didn’t state values and should have clarified that it was the ‘maximum depth *sampled*’, however an assumption has been made that for most records, the maximum depth sampled was probably entered (rather the maximum depth of the site). Therefore, V1 and V2 maximum depth values have been transferred to the new ‘maximum depth sampled’ field. Users of the data may wish to exclude maximum depth sampled values for V1 and V2 records due to this uncertainty.

Habitat

In some records, not all values for flow, substrate or riparian vegetation add to 100%.

Sample methods

Some records contain a value of ‘1’ in the NetsTrapsTotalNumber field, even though a higher number of nets/traps were used. Sometimes this is indicated in a remarks field, but often not. Conversely, some records contain sampling effort values (e.g., NetsTrapsTotalNumber) that might be considered to be unusually high, with the accuracy of these values not known. Occurs across V1, V2 and V3 records (although less commonly in V1 records).

Some records combine catch data under one method type (V2 records) even though multiple method types were used, because the ability to select ‘combination’ methods (e.g., combination of

nets and electric fishing) was removed for V2 records. Sometimes this is noted in the comments field. This issue also affects V3 records.

Some V2 records contain catch data for each individual trap, net or electric fishing pass (rather than the catch data being summed across traps/nets/passes as per the requirements for V3 records). If you require the total number of nets, use the maximum net/trap number/electric fishing pass value from the record. These records can be recognised as they will have ascending values within the EfmNumberOfPasses and NetsTrapsTotalNumber fields for each method type rather than a single number for each method type.

Taxon presence/absence

The eDNA method may indicate the 'presence' of a taxon much further down a waterway than they actually occur. eDNA records can be useful in showing the presence of a particular species within a catchment but should be used carefully if plotting species locations as individual points on a map.

Some records list species that were not present at a site, as indicated by the soughtNotFound field. Users should therefore not plot species presence using only the taxonName field.

How to cite the NZFFD

For the current citation of the NZFFD please see: <https://niwa.co.nz/information-services/nz-freshwater-fish-database/help>

It is also common to cite the two original reports on the NZFFD: McDowall and Richardson (1983) and Richardson (1989) – both are available at: <https://niwa.co.nz/freshwater-and-estuaries/nzffd/catchment-number-dictionary>.

Uploading data

To submit data to the NZFFD you will first need to register for an account by emailing an NZFFD administrator (fwdba@niwa.co.nz). Please note that this process may take a couple of days.

Once your account has been set up, you can log into your account here: nzffdms.niwa.co.nz

Definition of a record

The purpose of these guidelines is to help to decide how many NZFFD records you should enter for your data. Usually, whatever you have already called a 'site' in your dataset should probably be entered as a single NZFFD record, but this is not always obvious. Read the suggestions and prompts below and if you are still having difficulty deciding how many records to enter you can email an NZFFD administrator (fwdba@niwa.co.nz) to discuss this further.

Timing:

- Each record should be linked to a single time event, whether that's a morning/evening, a day, or less-preferably, longer events such as a week. The 'standard' would be to include data from a single site that was collected on one day into a record. Return visits to sample the same site on different occasions, should be entered as separate records.

Aspects to consider if your data relates to a stream or river:

- It is important to consider that only one set of co-ordinates can be assigned to your record, so you should think about how representative the co-ordinates are of the area you are entering

data for. This may mean that longer reaches (e.g., more than approx. 500 m) may need to be split into separate records.

- If the habitat or river layout changes significantly over a short distance, then it may be best to enter the data as separate records. For example, if you sampled above and below a dam then you should enter a separate record for data collected from upstream and downstream of the structure.
- Separate waterbodies should be entered as separate records, e.g., surveys of several small neighbouring tributaries are best entered as individual records.

Aspects to consider if your data relates to a ponds, lake, or wetland:

- It is important to consider that only one set of co-ordinates can be assigned to your record, so you should think about how representative the co-ordinates are of the area you are entering data for. A survey of a small pond would usually be entered as one record, but a survey that covers ten different areas of Lake Taupo should be entered as ten separate records. Obviously, there is a massive size range between these two examples, but once a waterbody is large enough that you have discrete sites (e.g., sets of nets) greater than a few hundred meters apart, each site should be entered as a separate record (remember, each record location can only be denoted by a single set of co-ordinates).
- Separate waterbodies should be entered as separate records, however closely linked small ponds in a wetland for example, could be entered as one record.

Other things to note:

- You should enter data from all method types at a site into a single record.
- All fish species caught should be entered into the same record, not one record per fish species.
- If you are repeatedly sampling a site and could potentially be catching the same fish multiple times, enter these as separate records.

Managing your entered records

The Sampling Events page provides a list of all your previously entered records. Each record has a 'status' to denote whether it is work in progress, submitted for approval, approved, etc. The default view after signing in shows a list of your 'active' records, which are those you are currently working on (i.e., in progress records that have not yet been submitted). To view all records (i.e., any status) click on 'View all your data' on the top left-hand side of the screen under the 'Sampling events' heading. You can also filter your own records by status in the 'Status' drop-down menu or search for a particular record by typing the record number into the 'Record No.' field on the top left of the page and clicking the 'Go' button.

Note: Records viewed on the website may contain deprecated values that will differ from the csv download files.

Description for each status:

- **In progress**
 - The status of a record when it is first created.
 - The record can be edited by the record creator and can be saved in this status and edited again later.
- **Submitted**
 - The record creator is satisfied with the data in the record, and it is submitted for approval.

- The record creator can still edit the record in this status.
- **Read**
 - Used by NZFFD admin once a record has been checked prior to approval.
 - In this status the record creator can no longer edit the record.
- **Approved**
 - Once NZFFD admin are satisfied that the record contains all necessary information and the information is correct, the record will be approved.
 - This record is now available in the search results and can be viewed by other users of the system.
- **Rejected**
 - If NZFFD admin are unhappy with the details of the record (e.g., missing essential data, contains errors, repeat of existing record) it will be rejected. Note however that NZFFD admin will try to contact the submitter of the record to try to resolve the problem before a record is rejected.
 - The record creator can once again edit the record in this status.
- **Edited after approval**
 - Used by NZFFD admin if a record was previously approved but there is a reason why it needs to be removed from the searchable records (e.g., there is doubt over the data in the record).

Note: the only records that are publicly searchable are those with a status of 'Approved', but NZFFD admin can access and alter records of all statuses.

[Create a new record](#)

To enter new data, you need to create a record by clicking the 'Enter new data' button on the right-hand side of the screen. A new record is created, with a new unique record number.

The data fields are broken down into five groupings, each on a separate page, as listed under 'Menu' on the left-hand side of the page:

- Event and Location
- Conditions
- Habitat
- Sample Methods
- Catch Data

Each page contains several fields in which you can enter data, but only those marked with a red asterisk are compulsory (i.e., required before you can save data and move to the next page and/or submit a record). The labels for each field are designed to be self-explanatory and some fields have additional information under the text box.

The compulsory fields are the minimum amount of data required to form a record and are:

- Event and Location
 - Sampling date
 - Institution name*
 - Observer name*
 - Name of sampled waterbody
 - Type of water body sampled
 - Sampling location coordinates
- Sample Methods

- Sampling method
- Sampling protocol
- Catch data
 - Taxon name
 - Either total count OR present but not counted OR not detected but sought at site

*These can be entered as 'Unknown institution or 'Unknown person' if not known.

Note: NZFFD admin will usually populate the catchment description fields (catchment number from Catchment lookup and Catchment name) and assign an REC segment if the record creator does not enter these.

Notes and tips for data entry

Event and Location

Institution name: If your institution is not listed in the drop-down menu, email NZFFD admin (fwdba@niwa.co.nz) to have it added.

Catchment lookup: You can download a copy of the Catchments of New Zealand here:

<https://niwa.co.nz/information-services/nz-freshwater-fish-database>

Coordinates: Please ensure you have the correct projection selected before entering your coordinates. If you cannot see your site location marked with a point on the map below the coordinate fields, it means your coordinates are not correct, or you have entered your coordinates under the wrong projection.

REC segment selector tool: The River Environment Classification (REC) is a digital network of New Zealand rivers that have environmental variables used for spatial relationships, and network routing variables for connectivity, associated with every segment in the network. Most sites within the river network can be assigned a REC segment (unique ID reference), but it is important that the segment that best represents your site is selected. The segment closest to your site may not necessarily be the most appropriate segment – you will need to look at the map to determine this. Note that not all sites will have a representative REC segment, and in this instance, it is better not to assign a segment. Examples of when not to assign a REC segment include:

- Isolated waterbody (e.g., farm pond) that is not connected to a drainage network
- Waterway with unnatural drainage, i.e., non-accumulating waterway network (e.g., water race)
- No REC segment available (e.g., very small stream tributary)

For lake sites, the most representative REC segment is usually the final segment that exits the lake. To select this segment, you will need to click the segment on the map and then enter your site coordinates.

Conditions

The Conditions page contains a number of different fields that describe the physical and chemical conditions of the site. None of the fields are compulsory. If entering data ensure you use the correct units, as per the field labels. Only one value is permitted per field.

Habitat

You can enter data for flow types, substrate and instream fish cover on the habitat page. Percentages for flow and substrate must add to 100%.

Sample Methods

Click the 'Add new sample method' button to add a new sampling method. You only need to add each method once, when it contains the same information (e.g., trap mesh size), i.e., you don't need to re-add the same method for each fish species you enter. When you enter fish data, make sure you click on the method you wish to associate the fish data with (the method will be highlighted in grey).

Catch Data

The list of taxa includes most known species of New Zealand freshwater fish. For some common genera that can be difficult to identify to species level if small, you can use the entries for 'Unidentified ...'. These taxa are:

- Bully
- Eel
- Flounder
- Freshwater mussel
- Galaxiid
- Mullet
- Salmonid
- Smelt

If no fish species were recorded at a site, use the entry 'No species recorded'. There is also a 'Marine species' option that may be useful when sampling estuaries or lowland rivers. You can note the species name in the 'Taxon remarks' field.

For each fish species, one of three fields must be populated to denote its presence at a site. You must either enter the total count of fish caught or seen or click the radio button for present but not counted or click the radio button for not detected but sought at site.

Submit a completed record

When you are satisfied with the data in your record you can submit it for approval (note that you must submit it for it to be approved and available for download). The Review page allows you to see all your entered data at a glance, and at the bottom of this page under 'Submit Sampling Event' there is a 'Submit for approval' button. You can also click the 'Save for later' button if you need to save the record and return to it later for further editing (it will remain as 'In progress'). When a record is submitted, NZFFD admin will check the contents of the record before approving it.

Note: To ensure data consistency within the NZFFD, admin may make changes to the data within your record if it doesn't meet the data standards (e.g., waterbody name).

Updating approved records

Once a record has been approved, only NZFFD admin can make changes to it. This is the same for records with the statuses 'Read' or 'Edited after approval'. If you have entered a record that has been approved, but you need to make changes to the data in the record, you need to email NZFFD admin (fwdba@niwa.co.nz).

References

- McDowall, R.M., Richardson, J. (1983) The New Zealand freshwater fish survey: a guide to input and output. *New Zealand Ministry of Agriculture and Fisheries, Fisheries Research Division Information Leaflet, 12: 1-15.*

Ministry of Business, Innovation and Employment. Retrieved 20 October 2021.
<https://www.mbie.govt.nz/science-and-technology/science-and-innovation/funding-information-and-opportunities/investment-funds/strategic-science-investment-fund/funded-infrastructure/nationally-significant-collections-and-databases/>

Richardson, J. (1989) The all-new freshwater fish database. *Freshwater Catch* 41: 20-21.

Appendix A Data dictionary

Table A-1. Data dictionary for Event and Location fields in NZFFD download files.

Field name	Units	Description
Event and Location		
nzffdRecordNumber		A unique number automatically assigned on creation of record (not modifiable by users)
institutionRecordNumber		The institution's/user's sample reference (e.g., SOE Sample Number)
eventDate		The start date of the sampling (NZST)
eventTime		The start time of the sampling (24-hour time, NZST). Some V1 records contain deprecated values 'day' or 'night'.
institution		The name of the institution that collected the data
samplingPurpose		Aim of the sampling event at site, captured within one of eight categories.
waterBody		The name of the sampled waterbody, as it appears on LINZ 1:50,000 topomap. Or, if not named on topomap, the concise descriptors are added, e.g., Pigeon Bay Stream tributary.
waterBodyType		Type of waterbody sampled
waterPermanence		Permanence of waterbody, if known
site		The locality sampled within the water body. Usually, a river site is a reach (often less than 500 m, e.g. 'Rainbow Reach'); a lake site may be a bay (e.g. 'Supply Bay') or stretch of shoreline ('Te Anau Downs'); etc.
catchmentNumber		The number of the catchment as defined in Catchments of New Zealand
catchmentName		The name of catchment within which the water body was located. For the North & South Islands, the catchment name is that of the river that drains into the ocean. For other islands, the island name is the catchment name (e.g., 'Stewart Island').
eastingNZTM		NZTM easting sampling coordinate
northingNZTM		NZTM northing sampling coordinate
decimalLongitude		Longitude (decimal degrees) sampling coordinate
decimalLatitude		Latitude (decimal degrees) sampling coordinate
recSegment		NZsegment from REC2
minimumElevation	masl	Minimum altitude of site. Automatically read in from REC2.
distanceOcean	km	Distance between site and the ocean, following watercourse. Automatically read in from REC2.
siteTidal		Whether the site is tidal
siteLandlocked		Whether the site is landlocked (i.e., no connection to the ocean)
downstreamBarrier		Presence of barrier downstream that could impede fish passage
eventLocationRemarks		General notes, e.g., site conditions, fish barriers, site access notes

Table A-2. Data dictionary for Conditions and Habitat fields in NZFFD download files.

Field name	Units	Description
Conditions		
siteReachLength	m	The length of waterbody sampled. May be approximate.
siteAverageWidth	m	The average sampled width of the site. May be approximate.
minimumSampledDepth	m	Minimum depth where samples were taken (not minimum depth of the site)
maximumSampledDepth	m	Maximum depth where samples were taken (not maximum depth of the site)
waterLevel		Flow conditions of waterbody at time of sampling
waterColour		Colour of the water at time of sampling. Some V1 records contain the deprecated values 'Tea coloured or brown' or 'Other'.
waterClarity		Clarity of the water at time of sampling
clarityMethod		Method used for measuring clarity
waterTemperature	°C	Temperature of the water at time of sampling
waterConductivity	uS/cm	Conductivity of the water at time of sampling
waterDissolvedOxygenPercent	%	DO (%) of the water at time of sampling
waterDissolvedOxygenPPM	ppm	DO (ppm) of the water at time of sampling
waterPH		pH of the water at time of sampling
waterSalinity	ppt	Salinity of the water at time of sampling
Habitat		
habitatFlowPercent		Comma separated list of percentage of each flow type present
habitatSubstratePercent		Comma separated list of percentage of each substrate type present
habitatInstreamCoverPresent		Comma separated list of presence of fish cover, denoted with y (=present) or n (=absent)
habitatRiparianVegPercent		Comma separated list of percentage of each riparian vegetation type present

Table A-3. Data dictionary for Sample Methods and Catch Data fields in NZFFD download files.

Catch Data		
samplingMethod		Sampling method used to sample the site.
samplingProtocol		Sampling protocol used to collect fish data
EfmNumberOfPasses		For multi pass electric fishing, the number of passes carried out at the site
EfmVoltage	V	The voltage the EFM was set to
EfmPulseRate	hertz	The pulse rate the EFM was set to
EfmPulseRateWidth	milliseconds	The pulse width the EFM was set to
EfmAnodeSize	NA	The anode size used
EfmMinutes	minutes	Total button/on time
EfmArea	m ²	Area sampled
NetsTrapsTotalNumber		The total number of nets/traps/seine-hauls/etc. within this type of method
NetsTrapsBaited		Whether bait was used in the nets/traps
NetsTrapsMeshSize	mm	The approximate size of the mesh on the nets/traps, grouped into one four values: <4 mm, 4–15 mm, >15 mm, multiple
NetsTrapsDayNight		Time of diel cycle nets in water
NetsTrapsAverageSetTime	hours	Average number of hours each trap/net was deployed at the site
ObservationArea	m ²	Area of site observed by spotlighting/snorkelling/visual by day
taxonName		Name of observed taxon. Genera without a species name were not identified to species level. Nil = no taxa recorded.
taxonRemarks		Comments about the taxon, e.g., taxon name not included in drop-down list or genetic sequencing completed
totalCount		Total number of individuals caught or seen at site using this method
present		Species detected but not counted at site
soughtNotDetected		Species targeted but not detected at site
occurrenceRemarks		Comments or notes about the occurrence
minLength	mm	Length of smallest captured fish of this species
maxLength	mm	Length of largest captured fish of this species
indLengths	mm	Comma separated list of lengths of individual fish
Data Version		
dataVersion		See 'NZFFD versions' section above

Appendix B Deprecated sample methods

Deprecated method	Notes
Electric fishing - combination of nets and electric fishing	Records with data combined across sampling methods are less useful – splitting data into each method type now required
Electric fishing - combination of nets traps and electric fishing	
Electric fishing - Combination of traps and electric fishing	
Fyke net - Fyke net including minifykes	Fyke net type now required
Observation - Observation	Replaced by observation methods with further detail (e.g., 'Visual by day')
Other - hinaki	Method rarely selected
Other - other (dynamite poison spearing releases etc.)	Replaced by more detailed methods (e.g., 'Toxicant Rotenone')
Other net - combination of nets	Records with data combined across sampling methods are less useful – splitting data into each method type now required
Other net - combination of nets and traps	
Other net - Push net	
Other net - Set net	Method rarely used
Other net - Unknown type of net	Replaced by 'Other – Not listed'
Other net - Whitebait	Replaced by more detailed methods (e.g., 'Other net – Whitebait scoop')
Traps - Box trap	Method rarely used
Traps - combination of Kilwell and Gee minnow traps	Method rarely used
Traps - Combination of traps	Records with data combined across sampling methods are less useful – splitting data into each method type now required
Traps - G minnow (coarse mesh, baited)	Replaced by 'Traps - Gee minnow' and metadata
Traps - G minnow (coarse mesh, unbaited)	
Traps - G minnow (fine mesh, baited)	
Traps - G minnow (fine mesh, unbaited)	
Traps - Unknown type of trap	Replaced by 'Other – Not listed'