



BTO Research Report No.614

**Odonata Recording Within BirdTrack:
Non-Technical Specification**

Authors

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1. Introduction

BirdTrack (www.birdtrack.net) is an online system for birdwatchers to enter records of birds, either as single “casual observations” or as “complete lists”; the latter are preferable as they allow assessment of recording effort and inference of species absence. BirdTrack is a joint project of the British Trust for Ornithology (BTO), Royal Society for the Protection of Birds (RSPB), BirdWatch Ireland (BWI) and the Scottish Ornithologists’ Club (SOC), the core funding being provided by the first two of these organisations and the project run from the BTO. Although observers are able to enter records for earlier years, the majority of records are from 2004 onwards when the system went live. Some 15 million bird records have been entered into BirdTrack to date, currently growing at around 6,000 records per day. It seems highly likely that the rate of record entry will continue to rise steeply for several years. The project currently has a full-time organizer and a modest budget for technical development and research.

In general, birdwatchers are not just interested in observing birds, but also wildlife more generally. Although the level of interest and expertise varies greatly between individuals, all birdwatchers are capable of collecting records of non-avian taxa to some extent. In recent years, there have been large numbers of birdwatchers who have become involved in observing and identifying dragonflies, butterflies and moths, and smaller numbers who have taken an interest in groups requiring more specialised knowledge, such as hoverflies or shieldbugs. A recent online questionnaire showed that the vast majority of BirdTrack users already make observations of other wildlife. However, the proportion of these people that then submit these observations to a recording scheme is low. For example, although 67% of BirdTrack questionnaire respondents said they tried to identify dragonflies in the field, only 15% of those said they subsequently submitted the records to a relevant organisation.

Within the same questionnaire, when asked to rate how important they considered the “option to record other wildlife” (to be developed within BirdTrack), the average respondent placed this between “fairly high” and “very high”. Thus the BirdTrack recording community has already shown substantial interest in this area. The BirdTrack Steering Group is also strongly in favour of such a development. The partners recognize the scientific and conservation importance of such biodiversity data and are keen to contribute to its collection and analysis. Additionally, it is considered that such facilities will enhance BirdTrack’s attractiveness to birdwatchers and will thus indirectly help to enhance the flow of bird records.

To help to take this process forward, Natural England provided funding for consultations, scoping and development of a specification for the inclusion of Odonata within BirdTrack, as a small but popular non-avian group which could be used as a model for incorporating a wider range of taxa in the future. As a result, consultations have taken place involving David Roy (Biological Records Centre - BRC), Jim Bacon (BRC), John van Breda (Indicia), Pam Taylor (British Dragonfly Society - BDS), Steve Prentice (BDS) and, to a less detailed extent, Jim Munford (National Biodiversity Network - NBN) and Trevor James (National Federation for Biological Recording - NFBR). Additionally, a substantial amount of detailed discussion has taken place internally within BTO.

The remainder of this document sets out proposals for including Odonata recording within BirdTrack. It is assumed that the reader is familiar with the basic operation and appearance of BirdTrack in its present form.

It should be noted that a separate technical specification document has also been produced for internal use by BTO Information Systems staff.

2. BirdTrack Users and Odonata Recording

At the outset, for simplicity, it will be assumed that all BirdTrack users will be presented with the possibility of recording Odonata.

A potential future development (but useful to consider at the outset in case it proves a sensible up-front investment) would be to allow users to be able to select/deselect different taxonomic groups of interest; this may become increasingly important if the number of groups becomes large (and increasingly specialist). This would require user-defined settings (in *My Details & Settings*); the necessary database architecture; and the ability for different pages (e.g. Add List) to present different groups depending on these settings.

3. Data Home

At the outset, it is unlikely that the current BirdTrack Data Home page will need to change significantly to accommodate Odonata recording. There are two possible exceptions however:

Firstly, any verification queries (see Section 12) will need to be signposted on the Data Home, as is the case for bird verification at present.

Secondly, the summary statistics for bird records could be extended to include Odonata statistics, but this is a low priority.

It should be noted that the overall appearance of the Data Home page may, in any case, be changing significantly over the coming year as a result of parallel wider developments.

4. Add Species List

To add a species list, the user currently progresses through a series of three dynamically generated pages: Visit details; Select species; Confirm species list. These are discussed in turn below.

4.1. Visit details

There are no critical changes to this page that require implementing to allow recording of Odonata. However, further consideration should be given to the recording of “weather notes”. Whilst this is not critical for this development, it is something that needs particular consideration for non-avian records. For example, the detection or otherwise of many invertebrates can be strongly influenced by the weather conditions.

Currently, BirdTrack allows the completion of a single free text field for weather notes, as to implement anything more detailed was too complex at the time this module was created. It is probably not possible, or even desirable, to try to design a fully comprehensive weather recording system within BirdTrack. However, a simple generic system, perhaps similar to that used for the Breeding Bird Survey (BBS) might be of great value. The following approach may be sensible:

Cloud cover: 0-33%; 33-66%; 66-100%

Precipitation: none; light; moderate; heavy. Frozen or not?

Visibility: good; moderate; poor

Wind direction: N, NE, etc

Wind strength: Beaufort scale 1-12, or some simple options: Calm, Light, Breezy; Strong? Latter perhaps useful in many cases, former perhaps better for seabirds as an example.

Temperature: Accept value or range of relative options?

The general “weather notes” text box could be retained still for users who want to add more detail.

Further consultation across a wider range of taxonomic schemes, and in consultation with BRC, would be valuable before finalising the preferred approach for recording weather. Initial discussion with BRC suggested that such a weather recording system may be over-complicated and unnecessary for general invertebrate recording and may be more suited to more structured surveys.

4.2 Select species

This page should incorporate tabs to let the user select different taxonomic groups. These tabs would operate at a higher level than the question about *Complete visit?* The question of whether a complete species list has been recorded must be posed separately for different groups, as it is perfectly possible that an observer may wish to record a complete list of birds, but only a partial list of Odonata, say.

When the Odonata tab is selected, the screen view shifts from birds (default) to Odonata. The species list presented within the Odonata tab should include, initially, a full set of widespread species, but for subsequent submissions for that site the list should be restricted to the species previously recorded at the site by the observer (as is the case for birds at present). All non-displayed species of Odonata would be available in an *Additional species* section at the bottom of the list. According to the BDS, no aggregate or hybrid taxa are required, although it may be that for user engagement purposes, it might be worthwhile including some aggregates such as *Aeshna sp.* Although such data are of highly limited use for research and conservation, they may more accurately describe the experience of the observer

in the field, particularly when relatively inexperienced. Giving observers such aggregate options can reduce the level of subsequent erroneous records, as it does not force the observer to add the record as one species or another before they are fully confident to do so.

Note that the definable limit set for bird lists, where the user can say how many species they want to add before they see a cut-down list, is unnecessary complication here and can be omitted.

The initial list of widespread species would be finalised in discussion with the BDS but, for planning purposes, is likely to be roughly the following 21 species:

Beautiful Demoiselle, Banded Demoiselle, Emerald Damselfly, Large Red Damselfly, Azure Damselfly, Common Blue Damselfly, Blue-tailed Damselfly, Red-eyed Damselfly, Common Hawker, Migrant Hawker, Southern Hawker, Brown Hawker, Emperor Dragonfly, Golden-ringed Dragonfly, Four-spotted Chaser, Broad-bodied Chaser, Black-tailed Skimmer, Keeled Skimmer, Common Darter, Ruddy Darter, Black Darter.

Species names would probably be best displayed as a concatenation of vernacular and scientific names, e.g. "Brown Hawker *Aeshna grandis*". Given the large number of species in some non-avian groups, and the often differing names between field guides and other sources, this would be a useful feature. Indeed, in many other taxonomic groups, there are no vernacular names and only a scientific name will be available to present. Scientific names are frequently presented in italics and that would be useful in the context of BirdTrack too. On this point, however, it would probably be unnecessary (and untidy) to add scientific names to the bird names?

Scientific names would be those considered definitive from the Natural History Museum species dictionary. Vernacular names should be those in most popular use amongst amateur naturalists, and should be those used by the BDS.

The species will be displayed either in taxonomic order or alphabetical order, as specified by a user in *My details and settings*; the same preference will be assumed across all taxonomic groups.

The existing "Present" box needs to be included for each species.

Unlike for birds, it is proposed that no "total count" box should be included. Instead, the users should be presented with six boxes representing different levels of breeding evidence, entirely analogous to that used by the BDS. These boxes would be for: Ad (Adult), Co (Copulating pair), Ov (Ovipositing), La (Larva), Ex (Exuvia), Em (Emergent). It is assumed that the majority of BirdTrack observers would be simply adding records for Adults, but it is sensible to allow for the standard BDS options at this point; it is also a useful way of educating the users as to simple additional detail that would add value to their records.

Each of the six boxes should be able to cater both for entry of simple integer values; approximate values shown as being preceded by a "c"; minimum values shown as being followed by a "+"; or one of the BDS standard abundance bands: A: 1, B: 2-5, C: 6-20, D: 21-100, E: 101-500, F: 501+. The abundance bands are a departure from normal BirdTrack practice and will require some thought as to the manner of presentation, means of database storage, and implications for functionality elsewhere within BirdTrack. Although desirable, the incorporation of such bands is not entirely critical to collecting useful Odonata records from BirdTrack and may be something that needs to be incorporated at a later stage. For example, it might be particularly relevant for uploading historical datasets (Section 8 below).

For record entry for birds, there is a top-level “breeding” field, for the user to indicate the highest level of breeding evidence noted. This is not required for Odonata, given the separation into the six recording types. However, it may be worth populating an equivalent database field with “confirmed breeding” for any records that are not simply of Adults.

The *remarkable* flag and the comments box should be retained in their current form.

The capacity to add optional details for each species should be retained, but not all the tabs available for birds are required for Odonata (nor will the same boxes be needed for all taxonomic groups). For Odonata, required tabs are: Pinpoint, Habitat, Sensitive. Non-required tabs are: Age/Sex, Breeding, Activity, Direction of flight.

Pinpoint: as for birds, except a) change help text to refer to Odonata instead, b) change “Details (e.g. nest, roost)” simply to “Details”; c) record pinpointed grid refs to 10m resolution (not 100m as at present). Consideration is required as to whether the count field within this tab can simply relate to integer values, or needs to cater for abundance bands as above.

Habitat: as for birds.

Sensitive: as for birds, except change the help text accordingly.

Finally, there is an issue of how a user can indicate that they have recorded (searched for) a group on a given visit, but have not found any species of that group. This is different to the user simply not recording the group. It is suggested that this eventuality is dealt with by the *Complete visit?* tick box. If this tick box is ticked, and no species are recorded, then the observer is assumed to have looked for the group and not found any. If the tick box is not ticked, and no species are recorded, then the observer is assumed not to have looked for the group.

4.3 Confirm species list

When the user has finished entering their list (complete or incomplete), and the *Submit species observations* button has been clicked, they will be sent to the *Confirm species list* page. This page needs to cater for all taxonomic groups recorded, but does not need to present null information for non-recorded groups.

There are a number of options for how different groups are presented on this page:

Option 1: Present all taxa in one combined list (although separated into groups). This may be most appealing to the user, and would help data entry to remain as quick as possible. However, it may present problems if different fields need to be presented for different groups. It may also be more complex if varying verification approaches are employed between groups. The *Complete list* information (i.e. whether all encountered species of that group were recorded or not) would need presenting separately for each recorded group.

Option 2: Present different groups on different tabs. This is consistent with the previous page. There may be a risk however, of the user not seeing/checking all of the tabs before confirming the list. It might be possible to force the user to confirm each tab separately, although this may then slow down the data entry process significantly. Perhaps the user might just be forced to do this if any threshold-breaking records (see below) were detected?

Option 3: Present different groups sequentially on different pages, with each group requiring confirmation separately. This may be the simplest to program but it may be less appealing for

the user as it would slow down the process of data entry, particularly if they are later able to enter records of a wider range of taxa in due course. There may also be a complex issue with respect to users deciding to “go back” to edit their submission; they would have to go back to the data entry page and not the confirmation page of the previous group.

However the page is arranged, Odonata records being submitted would be compared against pre-set thresholds, with appropriate warnings displayed when thresholds were exceeded. The threshold values would be as provided by the BDS. They would relate to: location, date, count, national rarity:

Location: for birds, records are checked against lists of local rarities per county. This may well be appropriate for Odonata (probably assigned against vice-counties). The same approach will be used for Odonata, but recording of this group (and many other taxonomic groups) is at the vice-county level. The BTO's verification system should be able to cope with definition of thresholds at the vice-county level, although as currently envisaged is unlikely to use the 10 km square approach adopted by the NBN record cleaner; this would require additional and divergent development to that being adopted by BTO.

Date: would be analogous to summer migrant birds, i.e. date should be flagged if not between given start and end dates. There are no regular over-winter dragonflies that are analogous to winter migrant birds (although there is one currently rare vagrant species, and furthermore this can apply for other taxa, e.g. moths). Threshold dates will be set at a vice-county level.

Count: it is uncertain if abnormally high count values have been defined by the BDS to date, but it should be relatively straightforward to populate some value for simple checks. High count thresholds will be set at a vice-county level.

National rarity: equivalent to situation for birds. Would need to check whether these differ for Britain and Ireland (and Channel Islands?)

The systems for implementing these verification checks are all operational, although there will still remain a job to populate the threshold values. This will be done in close consultation with the BDS. It should be noted, however, that if some thresholds are not available at a vice-county level, then the system will revert to checking against national-level threshold values.

With regard to the checks, it should be remembered that these are largely immediate sense-checks. The purpose of them is to a) alert users to possible inputting errors, and b) to inform and educate inexperienced observers when they are entering an unlikely record. However, it is anticipated that definitive checks are carried out by verifiers when records are sent on to them. Obviously, it is valuable to trap as many errors as possible at the outset, and to flag threshold-breaking records as such.

As for birds, if the user decides to go back and correct an error, they should go back to the *Species List* page; care will be needed to ensure that all relevant tabs are revisited.

When a list is confirmed, separate rows should be added to SUB (and any associated auxiliary tables) for each taxonomic group. It is not considered a high priority to be able to relink the SUBs relating to different taxonomic groups, although if a simple way to do this can be identified then it might be useful in due course? New rows in SUB should thus be identifiable to taxonomic group.

Rows added to OBS on record submission should include an assessment (in obs.valid?) of whether the observation was “assumed verified” (i.e. did not exceed threshold but has not been specifically checked) or “needs checking” (i.e. exceeds threshold and has not yet been specifically checked).

5. Add Casual Record

There should be no changes required to the site selection area on the casual records page.

A question to resolve is whether it is necessary for a user to be able to submit casual records of multiple taxa at the same time. For example, can a user add casual records of two birds, three dragonflies and a mammal and submit all at once? This would be beneficial to the user, but it is not critical and should be compared with the potential additional complexity in the application. It is assumed below, however, that it is possible to add multiple taxa in one go.

Ideally, the fields presented in the subsequent blue section of the page will vary depending on the taxonomic group involved.

An initial suggestion (although not the only potential solution) is that tab navigation is used to choose between taxonomic groups, to maximise similarity with the Add Species Lists page. Depending on the tab selected, the fields presented would differ. Assuming this approach, then;

Retain current fields Date, Hour, Remarkable, Comment in identical fashion as for birds. Omit Breeding Status.

Species box would allow auto completion of any Odonata species. Ideally it would also allow auto completion based on scientific name, in addition to common name? Perhaps this would be possible if, as suggested for Add Species Lists, the name presented is a concatenation of the vernacular and scientific names (e.g. Brown Hawker *Aeshna grandis*)? It should be noted that the species box should not allow choices across multiple taxonomic groups: there is potential for confusion here (not to mention an increasingly long list of choices). For example, some vernacular names (Peacock, Redshank, Grayling, Common Blue, etc) can apply to more than one taxonomic group so the potential for errors would be high if all groups were available via the same species name box; the risk would be removed if different taxonomic groups were presented on different tabs.

The six life-stage/breeding evidence categories (Ad, Ov, Co, La, Ex, Em) described in Add Species Lists (Section 4.2) should again be presented for Casual Records; again, it is assumed that the majority of records will be for Ad. The count values that can be entered for each of these six groups should be the same as within Add Species Lists, i.e. if possible (and perhaps at a later stage), allow inclusion of abundance bands A to F as well as integer values.

Optional details should be treated in an entirely analogous way to Add Species Lists, i.e. retain Pinpoint, Habitat, Sensitive. If necessary for design reasons (i.e. to allow the six count boxes to fit) it may be sensible to remove Remarkable and Comment to the optional details.

It is assumed that it is not necessary to include weather details within a casual record. We do not do this for birds and neither does the BDS simple record form request weather details. If there is a particularly significant weather feature that needs recording along with a casual record then it can always be entered in the comments field.

Following submission of the casual records, the *Confirm observations* page would then need to operate in the same way as for Add Species Lists, although with no need for consideration of Complete lists. The same solution as employed for Add Species Lists for confirmation of records across multiple taxonomic groups should be employed here.

Casual observations should be checked against verification thresholds in the same way as for Add Species Lists.

6. Add Roving Record

This should be considered of lower priority to Add Casuals, and should be tackled at a later stage, if at all. The main purpose of Add Roving Record was to help encourage people to move across to BirdTrack from the Bird Atlas 2007-11 system. It is felt that Roving Records are most appropriate when an observation is made away from a "site" (typically, along a roadside from a car, say). This is far less appropriate for Odonata, although it might still be a useful approach for some other taxonomic groups (e.g. deer).

7. Upload List

The vast majority of Odonata to be uploaded (rather than entered directly) will be of casual records. Given the far greater complexity of building a system for uploading lists, it is suggested that this should be treated as low priority. It should be tackled at a later stage; it may be of more relevance to some other taxonomic groups (e.g. moth-trapping lists).

8. Upload Casual Records

The ability to upload sets of Odonata casual records would be extremely useful to some users and should be taken forward at an early stage, albeit a lower priority than the Add Species List and Add Casual Records. It is possible that some birdwatchers may have sets of data that they could be encouraged to upload for the National Dragonfly Atlas project.

It seems likely that, at the outset at least, the user will need to specify which taxonomic group an uploaded file relates to, given recording differences between groups. It is not intended that uploaded files should be able to include taxa from multiple groups at once.

For the upload of a file of Odonata casual records, the “click here for examples and help” document will need altering to give specific details for the group. At a simple level, it will need rewording (to change “bird” to “dragonfly” for example).

The format of the uploaded file should be as follows:

Username, Place name, Date, Time, Comment, Sensitivity, Observer, Pinpoint – as present.

Grid reference – probably as present. However, some uploaded records will perhaps have grid references at a 10m resolution, compared to the current maximum 100m resolution allowed for birds. This will need to be considered during the coding.

Species name – as present, but will clearly require a link to different lookup list.

Maximum breeding evidence code – this will be omitted, for consistency with the approach taken for Add Species Lists and Add Casual Records.

Count – as described for Add Species List, this should ideally be able to take both integer values and BDS abundance bands A to F.

It is uncertain the extent to which it would be useful for the Upload Casual Records function to be able to receive count values for the six life stages/breeding evidence categories. Although it would be most consistent with the Add Species List/Add Casual Records approach, this would have to be weighed against the greater complexity of altering the existing bird upload processes to take in a substantially different data format. Given that the focus is on casual observations by people whose primary interest is birds, and for whom Odonata are a secondary interest, it may be sufficient to retain a single count field, assumed to represent a count of adult dragonflies.

Having prepared a file in the correct format and selected it, the equivalent process as for bird records should be followed, to check and upload the Odonata records. This is a fairly complex process and will need careful testing.

9. View/Edit Species List

In light of parallel work on major developments to the existing View/Edit Lists functions, it is suggested that expanding the existing View/Edit functions to include Odonata is undertaken as simply as possible at present. It is suggested that within the existing View/Edit Species Lists, the existing year-selector at the top of the first page is changed to a two-way year/taxonomic group selector.

Viewing an Odonata list should be relatively similar to the situation for birds, except:

The header of the list might want to include expanded weather details (if/when these are incorporated);

The list itself will not need Breeding as a displayed field;

The Count field might instead be displayed as six count fields, for the six life-stage/breeding evidence options. These count fields may have to display either integer values or abundance bands A to F;

The concatenated optional details will need fewer elements incorporating.

Editing an Odonata list will need to operate in an analogous manner as for birds, with an Odonata-specific data entry page able to be opened to edit species records.

10. View/Edit Casual Record

As with View/Edit Species List, this should be undertaken as simply as possible. Again, the year-selector should be changed to a year/group two-way selector. Fields displayed during viewing and editing will need to be those more appropriate to the taxonomic group.

11. Explore My Records (EMR)

First of all, it should be noted that other taxa are not required for Explore **Club** Records, as local bird recorders have no jurisdiction over Odonata records in their area (and BirdTrack is not planning on catering directly to local Odonata recording groups; we would envisage this would be done via the BDS).

Secondly, there is no current requirement to produce EMR outputs that cut across multiple taxonomic groups.

For EMR then, taxonomic group should be a selectable option in the parameters at the left hand side of the page. This should probably be a separate section, although it could potentially sit within the Species section? The species in the Species section drop-down will vary depending on the group selected. Birds should be the default group.

Within an EMR **tabular output**:

The header row should take the form: "32 species from 3412 records, 23 complete lists, 134 locations". For Odonata, whilst there is probably no requirement to take account of escapes or hybrids (both `bt_count4list=N`) and subspecies (i.e. where `bt_parent<>species_code`), it is proposed (in Section 4.2 above) that aggregate taxa (e.g. *Aeshna* sp.) may be required; these would also be coded (currently) as `bt_count4list=N`. Moreover, hybrids, escapes and subspecies may also need catering for with other taxonomic groups, so it will probably be simplest to retain the code used for the bird header row.

The table should show exactly the same fields as for birds. Reporting rate clearly needs to be calculated based only on Odonata complete lists.

Earliest and Latest may introduce a new area of complexity (although not critical to overcome immediately). The majority of species are resident, but Earliest and Latest will display the extremes of the flight period noted by an observer across the years (note that for Odonata we do not need to cater for any species that overwinter as adults, although this will be needed for other groups such as moths). However, given that the user can add records of other life stages this is less straightforward. For example, the larvae of dragonflies are present year round underwater. It would seem more appropriate to restrict Earliest and Latest to records of adults only. Ideally, these fields would be calculated as the earliest and latest calendar dates for any observation where the counts were not restricted only to La (larvae). Again, this is likely to be of relevance to some other taxonomic groups and their life-stages. We might, for example, want to record earliest and latest flowering times of plants; or dates when frog spawn is visible; or flight times of butterflies yet exclude caterpillar observations.

The tabular information should be exportable as Excel files, and as for birds, there should be two sheets within the exported sheet, one containing summary data and the other containing raw data. The raw data will need to take account of taxonomic group-specific issues, such as count values no longer being stored in the same database field.

Within an EMR **graphical output**:

There are currently a number of different graphical outputs used within EMR for bird records. For three of these (records per year; records per month; list progression) there is envisaged to be virtually no change to the approach used for bird records. However, for graphs where numerical abundance is

incorporated (peak count per visit), account will have to be taken of abundance data being stored in different fields.

Within an EMR **map output**:

There should be no difference to the approach taken for birds, except that some records may be pinpointed to 10m resolution.

12. Data Transfer and Queried Records

Having collected Odonata records within BirdTrack, it will be important that these can be transferred efficiently, for two main reasons: a) to allow records to undergo a process of verification by nominated individuals, and b) to make records available as appropriate to other users for a variety of purposes. Although there are a number of ways in which these aims could be met, the current expectation is as follows:

- a) BirdTrack users will be informed that any Odonata records they submit will be passed on to other users in an appropriate manner, and that they may receive queries from verifiers. They may be asked whether they are willing for their name to be passed on with the record.
- b) On a periodic basis, any new or altered Odonata records will be transferred to the Indicia community data warehouse (hosted at BRC), but will remain flagged as originating from BirdTrack. A unique identifier (probably `obs_id`) will be provided with the record to allow it to be linked between the BirdTrack and Indicia databases.
- c) Odonata records from BirdTrack will, when transferred, be initially flagged as either “assumed OK” (i.e. did not exceed threshold but has not been specifically checked) or “needs checking” (i.e. exceeds threshold and has not yet been specifically checked).
- d) Odonata verifiers will be able (via Indicia-based tools) to see the records from BirdTrack (in conjunction with those from other sources), although will only be able to see the observer’s name if permission has been given by that individual. The means of enabling communication between observers using one system (BirdTrack) and verifiers using another (Indicia) will require careful consideration. The verifiers will be able to:
 - a. leave a record as “assumed verified”
 - b. having considered a specific record and found it acceptable, classify the record as “verified”; a list of the unique identifiers of records reclassified as such should be sent back on a periodic basis to the BirdTrack database to ensure consistency.
 - c. having considered a specific record and found it questionable, be able to send a query message to the observer. Thus, a message and associated record identifier (`obs_id`) would be sent back to the BirdTrack database. The verification status of the record should change to “queried”. Following a communication (or not) with the observer, the verification status can be changed further to “verified” or “invalid”. Any further change of this sort should also be fed back to the BirdTrack database to ensure consistency.
- e) A BirdTrack user will be notified (probably via their Data Home) if one or more of their records has an outstanding query. They would then be able to see the record details and the query message sent by the verifier, and be able to respond to the verifier with further information. They may wish to edit or delete their record on the basis of the query raised by the verifier.
- f) An agreement will be drawn up between BirdTrack and the BDS setting out the manner in which records can be used, including issues such as accreditation, use of sensitive records, onward transfer to the NBN, etc.

- g) An agreement would be drawn up between BirdTrack and BDS as the primary organisation responsible for the taxonomic group, setting out the manner in which records can be used.

Some of the more immediate issues for resolution will be:

When / how frequently will records flow from BirdTrack to the Indicia warehouse; and when / how frequently will verification status changes and verification-related communication flow from Indicia to BirdTrack?

By what means will such transfer of information in both directions be achieved?

Exactly which fields of data will be sent to the Indicia warehouse, and will these map onto the Indicia data model sufficiently closely?

How will communication be enabled between individuals (observers and verifiers) operating through different systems?

As information transfer between the two databases is complex, the flow chart below attempts to set out the main features of the proposed system:

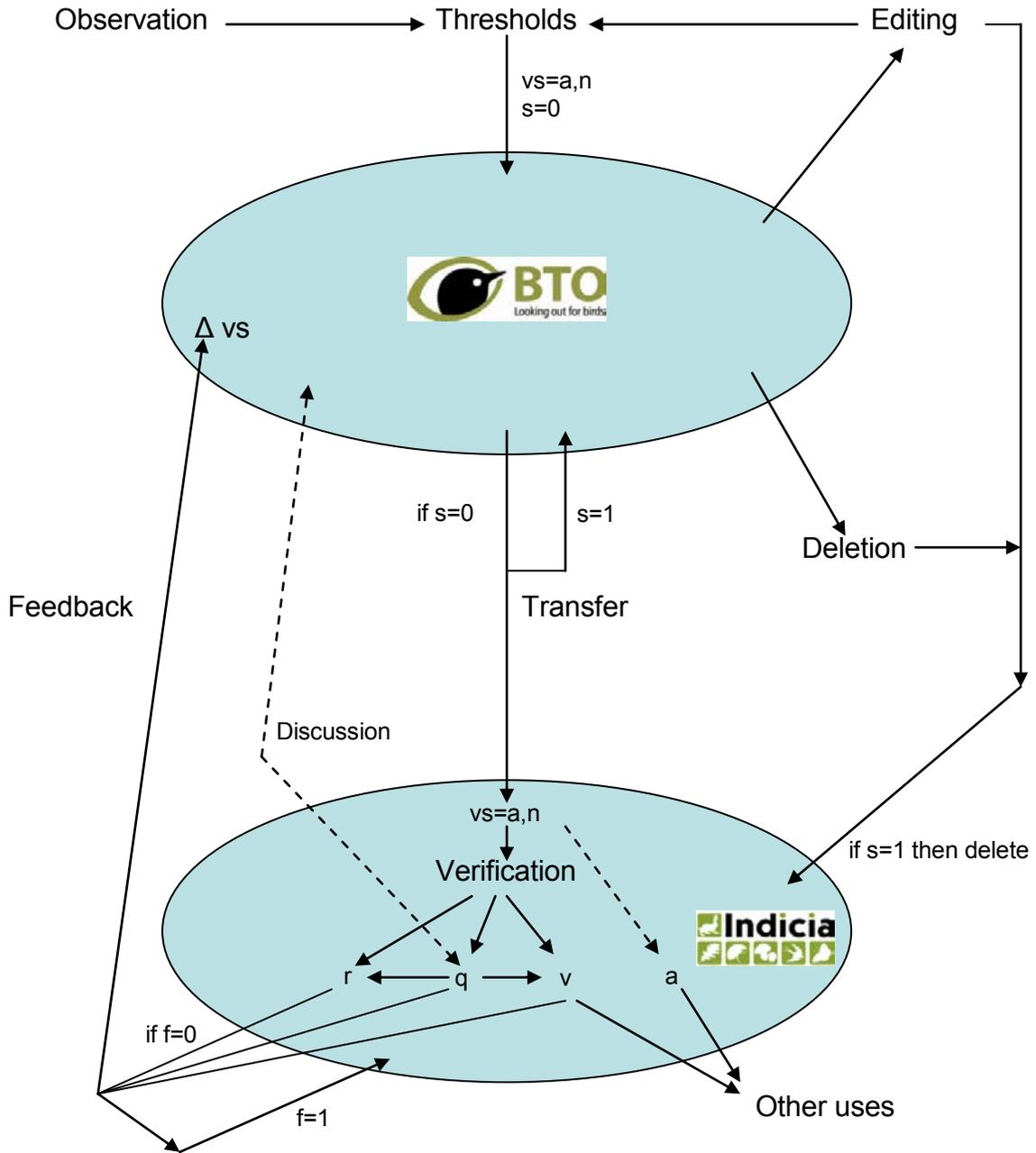


Figure 1. Verification status (vs): a (assumed OK), n (needs checking), v (verified), r (rejected), q (queried)
 Sent status (s): 0 (not sent), 1 (sent) – relates to whether record has been sent from BTO to Indicia
 Feedback status (f): 0 (not fed back), 1 (fed back) – relates to feedback from Indicia to BTO

13. Nightly Results

It is not envisaged that nightly public national or regional results for Odonata (either SAS generated or dynamic outputs) would be developed at the outset. At first, there will be a low quantity of data, and graphs or maps for publicity and engagement purposes will be generated manually. Over time, however, dynamic outputs would need to be produced. This will be considered alongside other proposed developments to such features within BirdTrack.

14. Changes to Supporting Material

To cover the expansion of BirdTrack from birds to other taxa (initially Odonata) it will be necessary to produce supporting material, both in the form of new and modified web “help” pages (linked from www.birdtrack.net), and news stories both on partner media outlets (including the BirdTrack eNewsletter; websites such as www.birdtrack.net, www.the-soc.org.uk, www.birdwatchireland.ie; and printed media such as BTO News, RSPB Birds, etc) and the wider wildlife recording media (such as British Wildlife, etc).

15. Prioritisation and Ordering of Work

The work described in this scoping document is extensive but modular. The BirdTrack core funding for development means that it should be possible to deploy some of the basic functionality relatively rapidly, ideally to be able to gather data as soon as possible within the forthcoming summer. This will give BirdTrack participants an easy and familiar method of contributing records to the current National Dragonfly Atlas project. However, the full functionality of the proposed developments here are likely to be too large for the core BirdTrack funding to be able to support. Therefore, it is sensible to prioritise the tasks involved, as follows:

Most urgent, and achievable with core funding:

- Add Casual Records (Section 5)
- View/Edit Casual Records (Section 10)
- Add Species Lists (Section 4)
- View/Edit Species Lists (Section 9)
- Supporting material (associated with all tasks)

Additional steps, requiring additional funding:

- Incorporation of BDS-preferred abundance bands (Sections 4, 5, etc.)
- Explore My Records (Section 11)
- Add summary statistics on Odonata to Data Home (Section 3)
- Data transfer and verification (Section 12)
- Upload Casual Records (Section 8)
- Enhanced weather recording (Section 4)
- Overnight results (Section 13)
- Add Roving Records (Section 6)
- Upload Lists (Section 7)
- Users to be able to select different groups within preferences (Section 2)

Subsequent steps:

Assuming Odonata recording via BirdTrack is as popular as expected, generating large numbers of records for conservation, thought should then be given to the next steps. It is suggested that the following non-avian taxonomic groups should be considered for inclusion in roughly this order, based on size of group and popularity with birdwatchers & general naturalists:

- Butterflies
- Mammals, amphibians and reptiles
- Moths
- Orthoptera
- Plants
- Ladybirds
- Shieldbugs
- Hoverflies
- ...and other groups in due course.

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