

Oxford Flood Alleviation Scheme: Breeding Birds

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1.0 Background

CH2M has been commissioned by the Environment Agency to undertake a full suite of protected fauna surveys within the proposed Oxford Flood Alleviation Scheme (OFAS). Detailed surveys were proposed within the Oxford Flood Alleviation Scheme Ecological Appraisal (CH2M, 2015¹), which identified the need for further surveys, including breeding birds.

A breeding bird survey was conducted by Hazelwood Conservation ecological consultants to identify and provisionally map species of conservation concern which occurred with evidence of breeding within the proposed Oxford FAS.

A series of detailed surveys were undertaken by the ecological consultants between May and July 2017. This data was analysed by CH2M to estimate breeding ranges for a number of species. These breeding events then informed mitigation options for the Oxford FAS.

The objectives of the breeding bird survey were:

- to identify the location and activity levels of any birds of conservation concern within the proposed OFAS;
- where breeding is suspected, to preliminary sketch of breeding range to inform an assessment of potential impacts and principles for mitigation.

The aim of this report is to identify key species and summarise their activity, and provide mitigation and recommendations. In addition the report provides a list of all species sighted, with frequency of sighting.

All maps and details indicating the location of breeding birds are treated as CONFIDENTIAL due to the risk of egg collectors. Consequently, the circulation of this report is limited to the relevant authorities.

2.0 Methodology

Walkover

The area of the proposed scheme was divided into 15 separate transects, each given an alphanumeric code (T1 – T15). These transects were then each surveyed once a month from May until July, during the bird breeding season.

An adapted Common Bird Census (CBC)² was conducted to collect information on species presence along with the direction in which the bird was travelling. By over-laying all of the information gathered

¹ CH2M (2015) *Oxford Flood Alleviation Scheme: Ecological Appraisal*. Environment Agency

² <https://www.bto.org/about-birds/birdtrends/2011/methods/common-birds-census>

over the entire survey period, approximate breeding territories can be mapped. These maps can then be used to estimate location of potential breeding along with informing mitigation options. Two experienced ecologists from Hazelwood Conservation conducted all surveys over a three-day period each month, alternating transect order to avoid bias.

All species were recorded, but only species listed on the Birds of Conservation Concern 4 (BoCC 4³) red or amber lists and with evidence of breeding were mapped, with individual species ecology used to determine likelihood of the presence of breeding birds within the scheme.

The survey involved travelling along each transect, noting down; species, location, behaviour, direction of travel and any other aspects which might be deemed necessary to map breeding bird habitat. Other landscape features which might support red or amber listed species were also of note, specifically earth river-banks for common kingfishers *Alcedo atthis* and areas suitable for nocturnal species, such as barn owls *Tyto alba*. These species would require specialist surveying to be recorded on site and likely to be missed using the general methodology described above.

Once all transects were completed, over the entire data collection period, data were over-laid by an experienced ecologist. When all of the data are pooled together, territories can be estimated based on the observed behaviours. These maps are displayed at the end of this technical note.

Limitations

Birds are highly mobile species and difficult to map. Their aversion to predators also provides a challenge when trying to map their territories as some species will deliberately travel away from their nests, if they feel threatened, to protect young. Along with establishment of a new nest each year, a single series of visits can only provide details of activity present on site at the time of survey. This limitation was taken into consideration within the results and recommendations made in this report.

Access was not always possible into areas of extremely dense vegetation in order to carry out a thorough survey. Areas of dense vegetation were walked around to check for nesting activity with details mapped as accurately as possible.

All work carried out in preparing this report is based upon the data received from Hazelwood Conservation, CH2M's current professional knowledge and understanding of current relevant UK standards, best practice and legislation. Changes in this legislation and guidance may occur in the future and lead to the conclusions needing to be reviewed.

3.0 Legislation

All nesting birds and their nests are protected in the UK under the Wildlife and Countryside Act 1981 (as amended). Some species, including barn owl *Tyto alba* are further protected under Schedule 1 of the same Act.⁴

Undertaking an activity which could result in damage to any nest, or any form of disturbance for Schedule 1 breeding birds, may constitute an offence. Natural England is empowered to issue a licence permitting potentially damaging or disturbing activities to be undertaken in certain circumstances, including if there is a clear health and safety risk to members of the public.

³ https://www.bto.org/sites/default/files/shared_documents/publications/birds-conservation-concern/birds-of-conservation-concern-4-leaflet.pdf

⁴ <http://www.ukwildlife.com/index.php/wildlife-countryside-act-1981/schedule-1/>

4.0 Results

The attached maps, received from Hazelwood Conservation, display the probable breeding ranges mapped using the information collected during the surveys of 2017. Each map represents a single species. Transects were consistent, and repeated, throughout all surveys. Table 4.1 explains the symbols used on the maps.

Table 4-1 Map symbology. All symbols below using 'A' as an example.


Symbol	Definition
♀	Symbol for female bird recorded
♂	Symbol for male bird recorded
A _{JUV}	Juvenile bird
A _{FOOD}	Individual carrying food, often an indication of young nearby.
A	Letters represents the month which the species was recorded at that location. A = April, B = May, C = June, D = July
○	Circle with the letter inside is a singing bird at that location
<u>A</u>	Symbol underlined represents the location in which the bird was identified vocalising (not song).
<u><u>A</u></u>	Symbol double-underlined represents the location in which the bird was repeatedly alarm calling or other vocalisation (not song), thought to have strong territorial significance.
A → A	The same individual recorded moving from one location to another.
A – ? – A	Individual seen moving in that direction but, due to a broken sight line, might not be the same individual spotted at the second location.
→ A	Individual seen flying in and landing at that location, origin unknown.
A →	Individual seen flying out, destination unknown.
A - - - - A	Contemporary contact of two different birds, used to represent separate singing males or separate pairs for example
	Grey (pencil) circle, sometimes with a number inside, represents the probable breeding territory for that species within the map. Numbers are used to number different territories, of the same species, upon the same map.

Table 4.2 below lists all species recorded during the surveys.

Table 4-2 Total list of species recorded during the breeding bird survey, along with those requiring mitigation, in order of recorded frequency. Recorded frequency displayed as the percentage of species occurrence throughout all sixty transects conducted between April and July 2017.

Common name	Scientific name	BoCC listing	Proposed mitigation	Recorded frequency
wren	<i>Troglodytes troglodytes</i>	Green		98%
robin	<i>Erithacus rubecula</i>	Green		92%
woodpigeon	<i>Columba palumbus</i>	Green		92%
blackbird	<i>Turdus merula</i>	Green		90%
goldfinch	<i>Carduelis carduelis</i>	Green		88%
blue tit	<i>Cyanistes caeruleus</i>	Green		87%
blackcap	<i>Sylvia atricapilla</i>	Green		85%
dunnock	<i>Prunella modularis</i>	Amber	Yes	82%
chiffchaff	<i>Phylloscopus collybita</i>	Green		82%
magpie	<i>Pica pica</i>	Green		78%
great tit	<i>Parus major</i>	Green		75%
whitethroat	<i>Sylvia communis</i>	Green		72%
carrion crow	<i>Corvus corone</i>	Green		70%
song thrush	<i>Turdus philomelos</i>	Red	Yes	68%
chaffinch	<i>Fringilla coelebs</i>	Green		68%
greenfinch	<i>Chloris chloris</i>	Green		48%
bullfinch	<i>Pyrrhula pyrrhula</i>	Amber	Yes	47%
mallard	<i>Anas platyrhynchos</i>	Amber		40%
green woodpecker	<i>Picus viridis</i>	Green		40%
starling	<i>Sturnus vulgaris</i>	Red	Yes	37%
jackdaw	<i>Corvus monedula</i>	Green		37%
long-tailed tit	<i>Aegithalos caudatus</i>	Green		35%
ring-necked pheasant	<i>Phasianus colchicus</i>	-		33%
red kite	<i>Milvus milvus</i>	Green		32%
black-headed gull	<i>Chroicocephalus ridibundus</i>	Amber		30%
cormorant	<i>Phalacrocorax carbo</i>	Green		30%
great spotted woodpecker	<i>Dendrocopos major</i>	Green		28%
swallow	<i>Hirundo rustica</i>	Green		28%
house sparrow	<i>Passer domesticus</i>	Red	Optional	27%
moorhen	<i>Gallinula chloropus</i>	Green		27%
jay	<i>Garrulus glandarius</i>	Green		25%
kestrel	<i>Falco tinnunculus</i>	Amber	Optional	23%
reed bunting	<i>Emberiza schoeniclus</i>	Amber	Yes	23%

Common name	Scientific name	BoCC listing	Proposed mitigation	Recorded frequency
swift	<i>Apus apus</i>	Amber		22%
Canada goose	<i>Branta canadensis</i>	-		22%
linnet	<i>Linaria cannabina</i>	Red	Yes	20%
buzzard	<i>Buteo buteo</i>	Green		18%
goldcrest	<i>Regulus regulus</i>	Green		18%
mistle thrush	<i>Turdus viscivorus</i>	Red	Yes	17%
willow warbler	<i>Phylloscopus trochilus</i>	Amber		15%
collared dove	<i>Streptopelia decaocto</i>	Green		15%
skylark	<i>Alauda arvensis</i>	Red		13%
herring gull	<i>Larus argentatus</i>	Red		10%
lesser black-backed gull	<i>Larus fuscus</i>	Amber		10%
greylag goose	<i>Anser anser</i>	Amber		8%
stock dove	<i>Columba oenas</i>	Amber		8%
grey heron	<i>Ardea cinerea</i>	Green		8%
raven	<i>Corvus corax</i>	Green		8%
house martin	<i>Delichon urbicum</i>	Amber		7%
kingfisher	<i>Alcedo atthis</i>	Amber		7%
mute swan	<i>Cygnus olor</i>	Amber		7%
sparrowhawk	<i>Accipiter nisus</i>	Green		7%
treecreeper	<i>Certhia familiaris</i>	Green		7%
cuckoo	<i>Cuculus canorus</i>	Red		5%
reed warbler	<i>Acrocephalus scirpaceus</i>	Green		5%
sedgeworker	<i>Acrocephalus schoenobaenus</i>	Green		5%
meadow pipit	<i>Anthus pratensis</i>	Amber	Yes	3%
pie wagtail	<i>Motacilla alba</i>	Green		3%
feral pigeon	<i>Columba livia domestica</i>	-		3%
grasshopper warbler	<i>Locustella naevia</i>	Red		2%
grey wagtail	<i>Motacillidae cinerea</i>	Red		2%
spotted flycatcher	<i>Muscicapa striata</i>	Red		2%
yellowhammer	<i>Emberiza citrinella</i>	Red		2%
common tern	<i>Sterna hirundo</i>	Amber		2%
oystercatcher	<i>Haematopus ostralegus</i>	Amber		2%

Incidental sightings of other species: A red-eared terrapin *Trachemys scripta elegans*, an introduced non-native species, was recorded during the June breeding bird survey. The OFAS team had already been informed of anecdotal evidence of the occurrence of this species; this was the only sighting of the species during any of the project's surveys. This confirmed that at least 1 individual was present

within the area of the proposed scheme, specifically within Transect 11 (T11), grid reference SP518034, at Kennington Pit LWS.

5.0 Discussion

A total of 65 species were recorded throughout the sixty transects, surveyed between April and July of 2017. Fifteen of those species were recorded in over half of the total transects. These were, unsurprisingly, the common species with a varied diet and often with the ability to adapt to human-modified environments, such as open gardens and parks. Two of these species recorded in over half of the total transects, are listed as either amber or red on the BoCC 4; dunnock (amber) and song thrush (red). Both of these species thrive in a mosaic habitat, feeding on both insects and seeds. Within the scheme it is likely that both will be able to adapt to the construction and operation of the OFAS throughout the site.

Almost all of the red and amber species which have proposed mitigation are those which are associated with either edge habitat or free-standing scrub, the exception being house sparrows and kestrels. Due to the clearance required during the construction of the OFAS, without mitigation, these species are likely to be most affected by the loss of suitable breeding habitat. Construction noise and an increased human presence is also likely to cause disturbance to these species.

These are, however, considered to be temporary disturbances to breeding birds as they will not continue into the operation of the scheme. The planned increase of wetland areas, and associated planting, along with enhanced planted woodland and hedgerow should provide a benefit once the scheme is complete. Planting native shrubbery which fruits and/or attracts invertebrate prey will also benefit breeding birds.

Newly planted trees within the scheme will not, immediately, be suitable for nesting birds as many require holes or cracks to establish new nests within. Without mitigation, this might have an impact upon breeding birds for decades into operation (once trees are mature).

6.0 Mitigation

Proposals for mitigation are suggested below to inform the OFAS Avian Mitigation Strategy. These proposals aim to reduce and/or avoid potential adverse impacts on breeding birds that could result following commencement of site preparation and construction works, to ensure that the works comply with current legislation. Based on the findings presented here, the following options are recommended:

- Principles for Mitigation Design

- Vegetation Clearance

Vegetation clearance would preferably occur outside the bird nesting season (middle of February to end of August), though the use of an ecologist can be used to supervise during this time, as vegetation is cut to ground level and then removed. All work should be undertaken in daylight hours only with any security lighting pointing away from vegetation to prevent disturbance.

All debris will be removed immediately after clearance to avoid being used for further, new, nest establishment.

- Additional surveys

A pre-construction survey will be required throughout the entire scheme in advance of mobilisation of works to identify any active nests which may be present and therefore affected.

If areas cannot be accessed, with suitable habitat present, then breeding birds must be assumed.

- Nesting habitat loss

When the proposed scheme is compared to the mapped territories, a number of potential losses to breeding habitats are noted. As such, mitigation will be needed to support the species of conservation concern, named within this technical note.

If any species are noted as breeding, immediately prior to works commencing, then all works must be halted immediately and a suitably experienced ecologist consulted. It is

unlikely that a disturbance license will be permitted, therefore causing delays to the scheme until the nest has fledged. Therefore, it is important that all vegetation clearance must be conducted before the bird breeding season to reduce the possibility of delays.

- Foraging habitat loss

Loss of foraging habitat will lead to a reduction in available resources for all birds, increasing competition among all species. It is recommended that appropriate tree/scrub species are planted where possible to include native fruit, berry and nut producing species such as hawthorn, blackthorn, hazel and bramble to provide alternative food resources for birds.

- Enhancement

A number of species were recorded as probably breeding 'close off-site'. In these circumstances, it is probable that the proposed scheme is likely to have an impact upon nest site availability, reducing the option for breeding in the subsequent years of construction. As such, the scheme can erect extra nest boxes in these areas for enhancement, specifically for these species. The presence of these additional nest boxes will support the current population, providing further nesting resources, along with potentially expanding breeding territories and encouraging the use of the OFAS habitat.

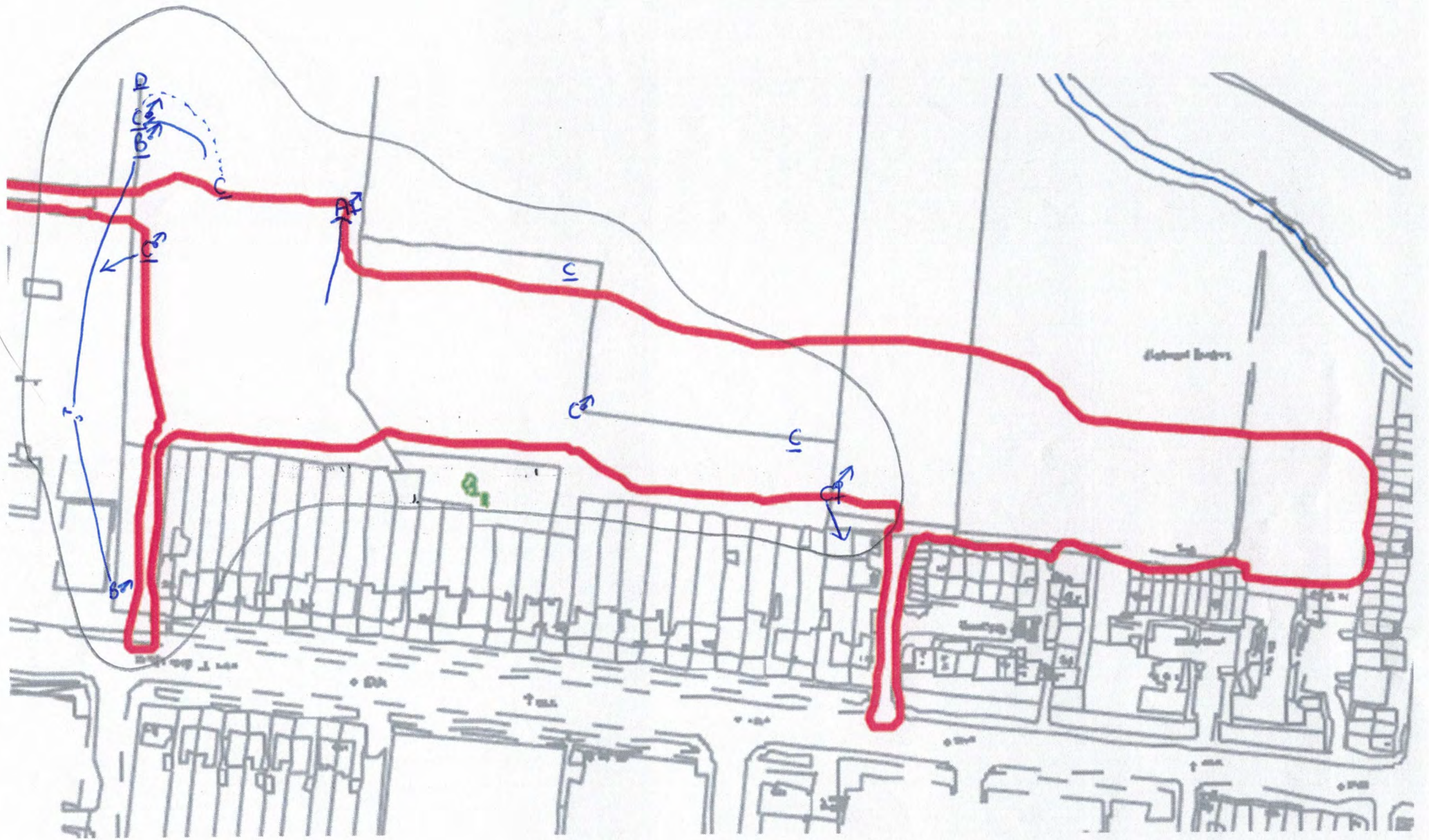
- Other bird species

It should be noted that only species of conservation concern are mapped within this technical note. As all breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended), common species should also be surveyed for before / during construction of the OFAS, if habitat clearance will be occurring during nesting season, as nest destruction would lead to an offence.

7.0 Conclusion

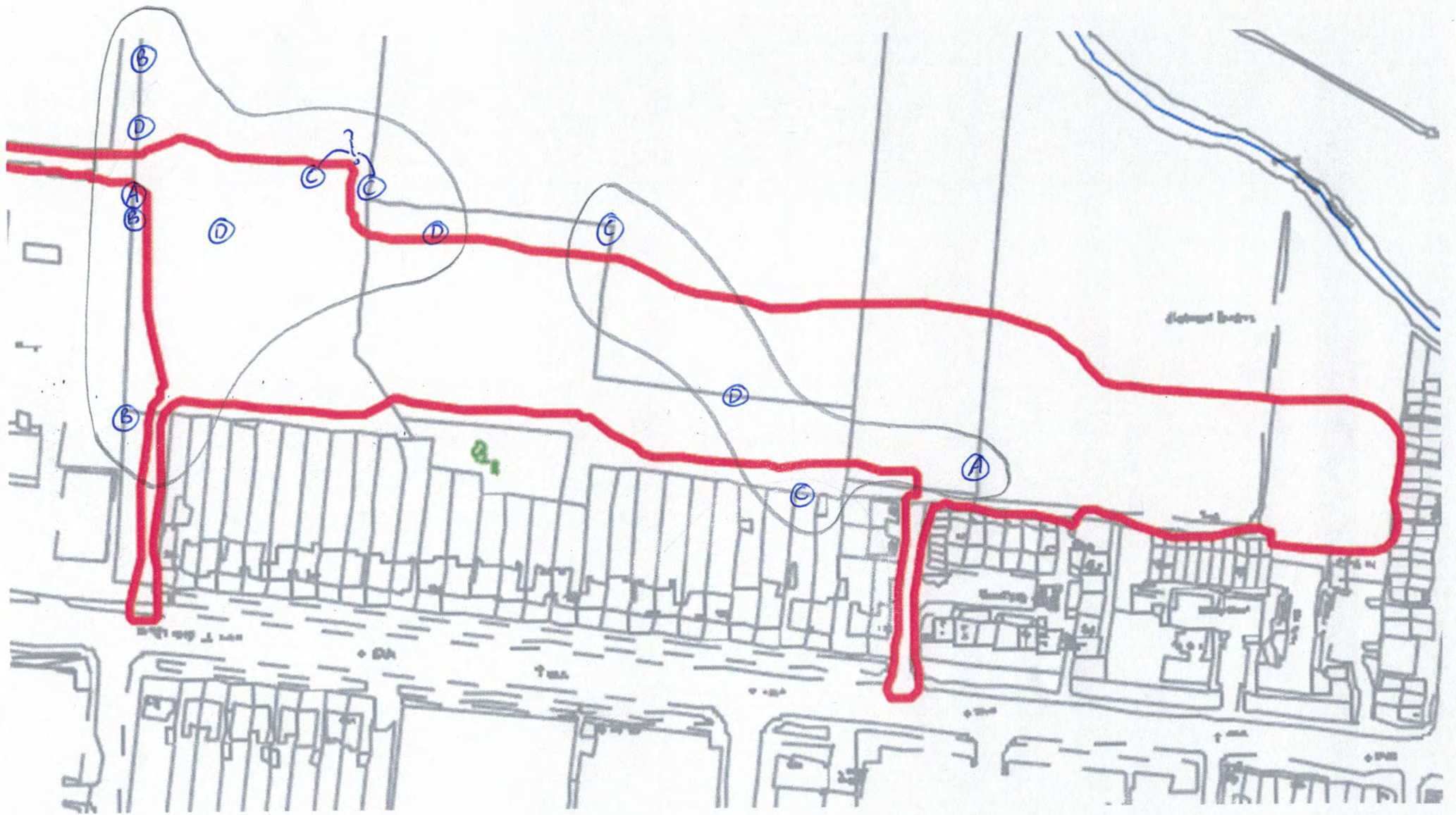
This technical note has mapped probable breeding territories throughout the OFAS, of red and amber listed birds of conservation concern, during the breeding season of 2017. There were a number of breeding ranges were recorded throughout the entire scheme, though it should be noted that birds will establish new nests in suitable habitats, so a survey may only be current for one year, or until the next breeding season.

Subject to the recommendations set out above in relation to avoiding or mitigating impacts to breeding birds, it is considered that the OFAS can be implemented without significant adverse ecological impacts, will not be detrimental to the conservation status of the breeding birds present, and be in accordance with relevant legislation and planning policy.



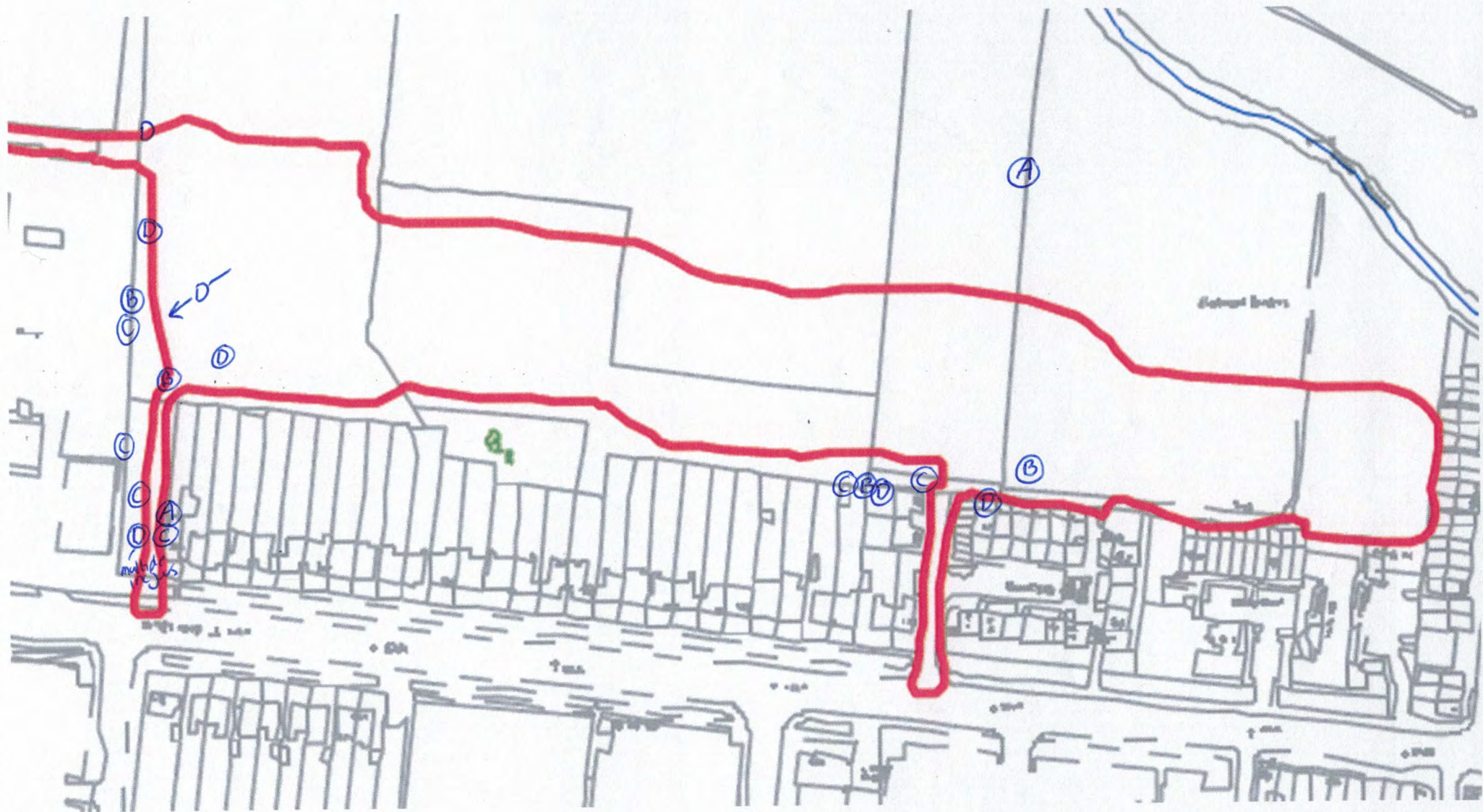
TRANSECT 1
BULLFINCH SPECIES MAP

1 territory



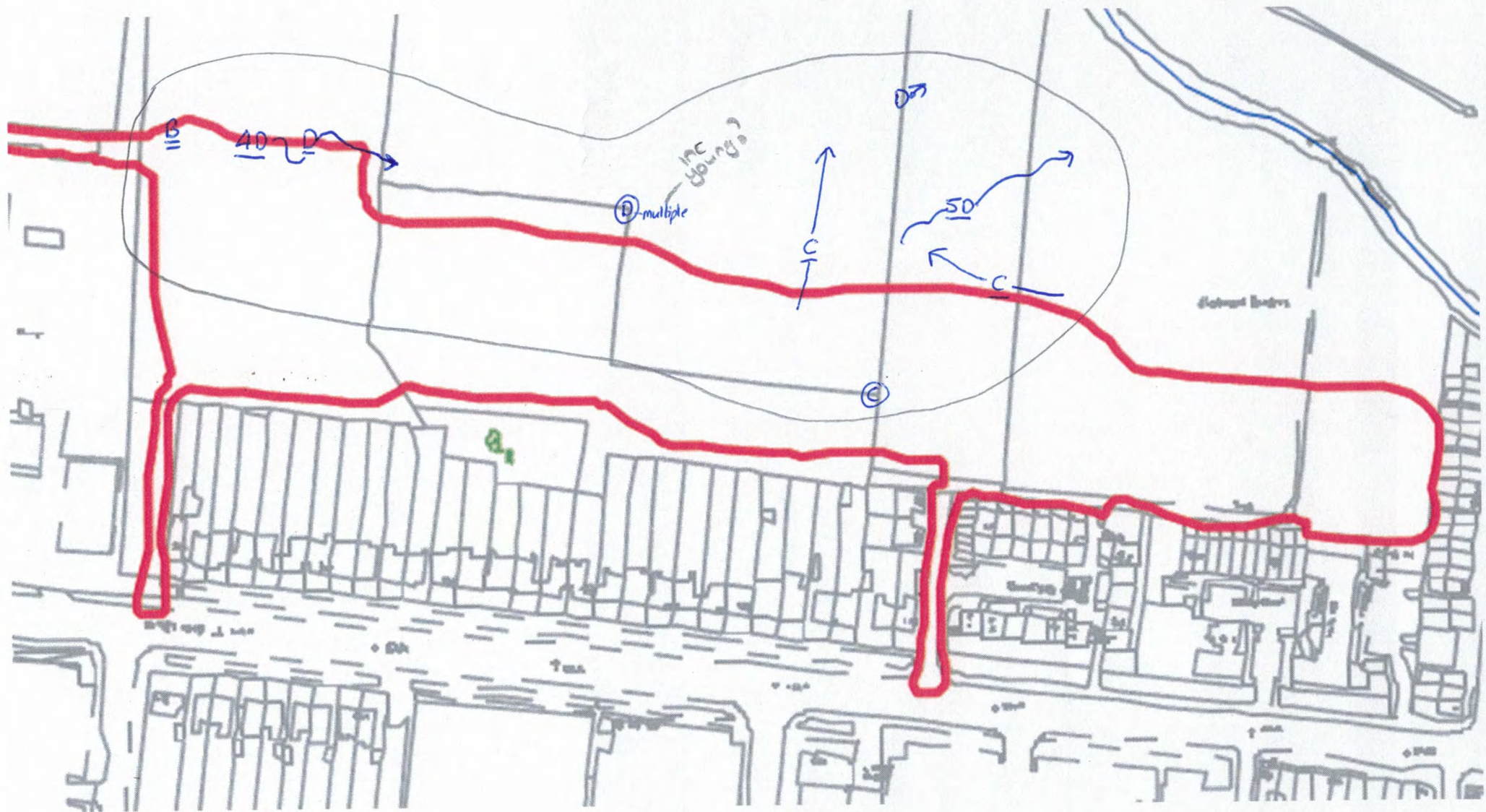
TRANSECT 1
 DUNNOCK SPECIES MAP

2 territories



TRANSECT 1
HOUSE SPARROW SPECIES MAP

Confirmed breeding but
location most likely offsite
in adjacent housing and buildings.



TRANSECT 1
LINNET SPECIES MAP

Semi-rural
2 breeding pairs



TRANSECT 1
SONG THRUSH SPECIES MAP

1 territory
on site



TRANSECT 2
DUNNOCK SPECIES MAP

— territory



└ territory

TRANSECT 2
SONG THRUSH SPECIES MAP



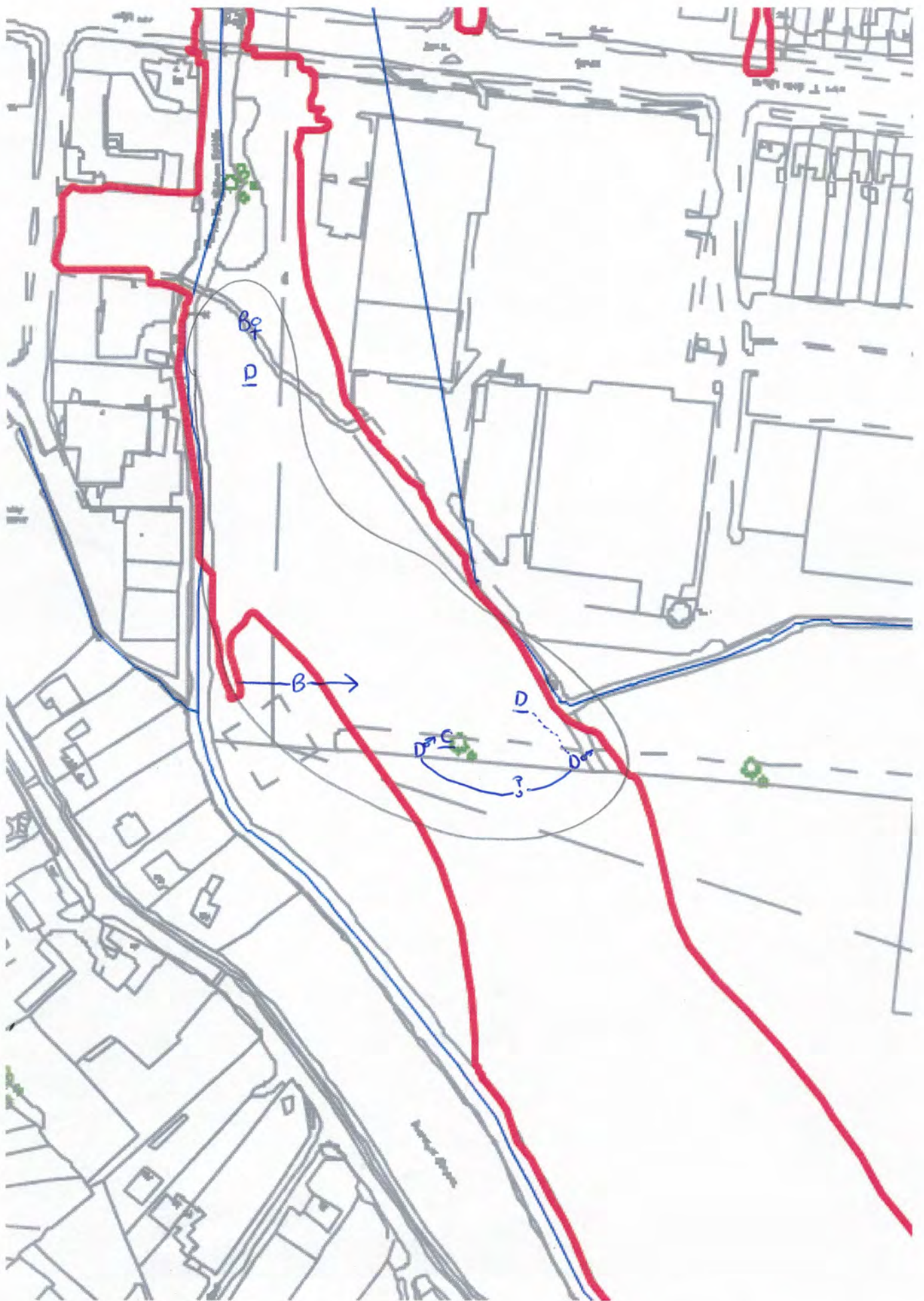
TRANSECT 3
DUNNOCK SPECIES MAP

┌ territory



1 territory

TRANSECT 3
SONG THRUSH SPECIES MAP

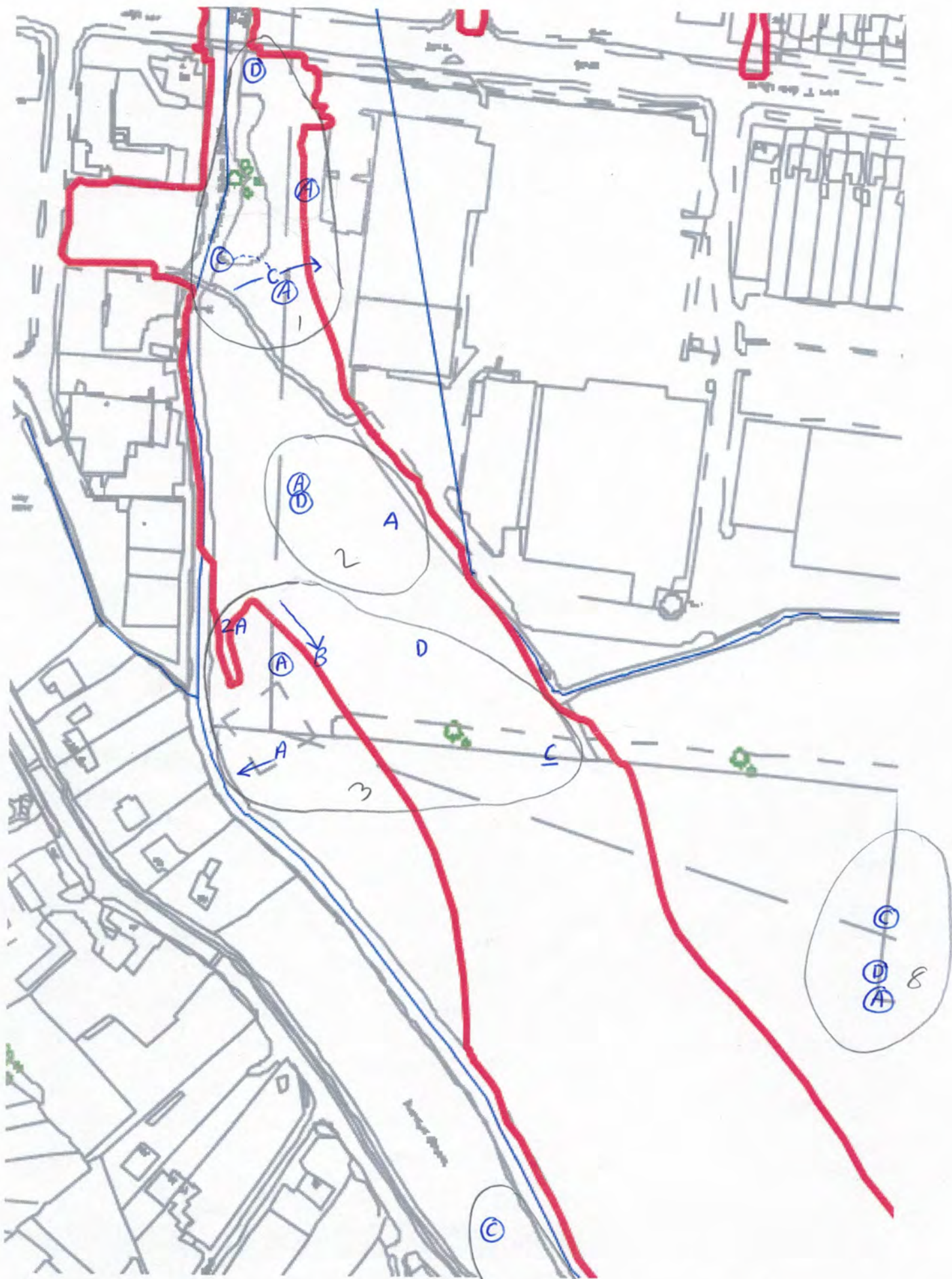


TRANSECT & MAP 1 OF 2
BULLFINCH SPECIES MAP

1 territory



TRANSECT 4 MAP 2 OF 2
BULL FINCH SPECIES MAP

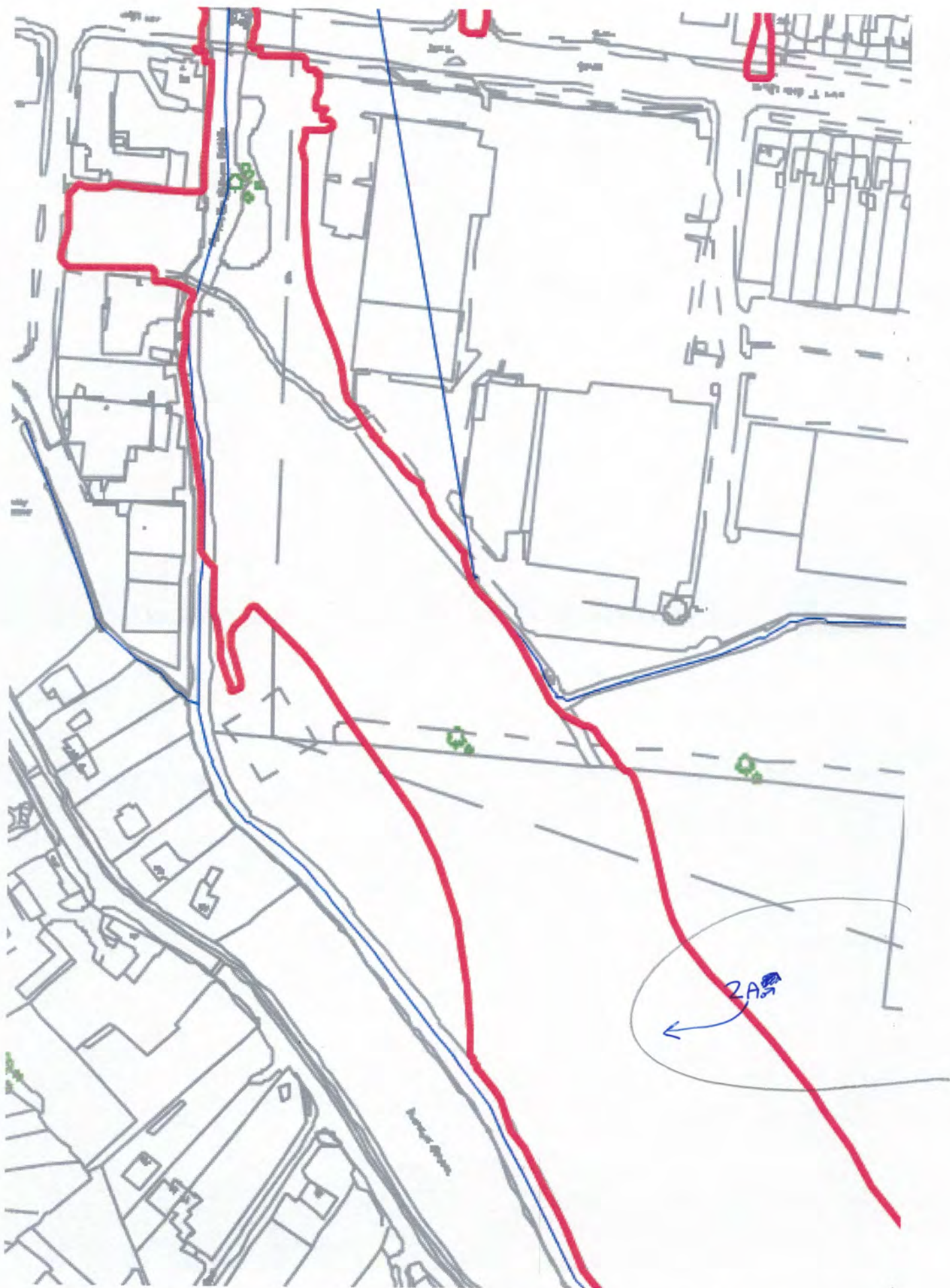


TRANSECT 4 MAP 1 OF 2
DUNNOCK SPECIES MAP

3 territories
(5 outside boundary)



TRANSECT 4 MAP 2 OF 2
DUNNOCK SPECIES MAP



TRANSECT 4 MAP 1 OF 2
REED BUNTING SPECIES MAP

2 territory -
on site in tall reeds
in meander or hedge -
or offsite?



TRANSECT & MAP 2 OF 2
REED BUNTING SPECIES MAP



TRANSECT 4 MAP 1 OF 2
SONG THRUSH SPECIES MAP

2 territories -
plus another 2
territories just off site.



TRANSECT 4 MAP 2 OF 2
SONG THROUGH SPECIES MAP

TRANSECT 5
DUNNOCK
SPECIES
MAP

2 territories
on site
(of 4
clusters)



TRANSECT 5
KESTREL SPECIES
MAP

Non-breeding
on site

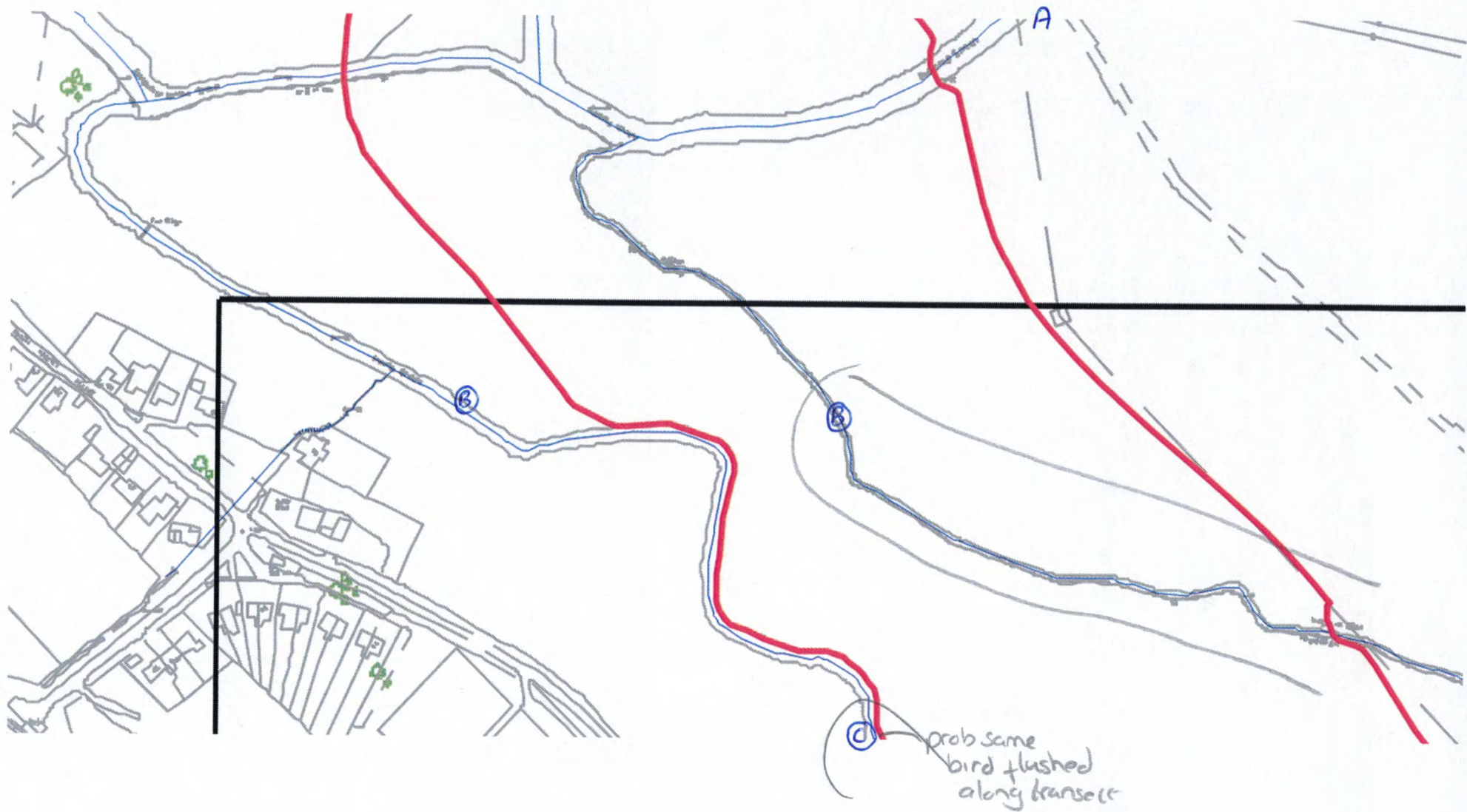
1 prob
territory just
off site



TRANSECT 5
SONG THRUSH
SPECIES MAP

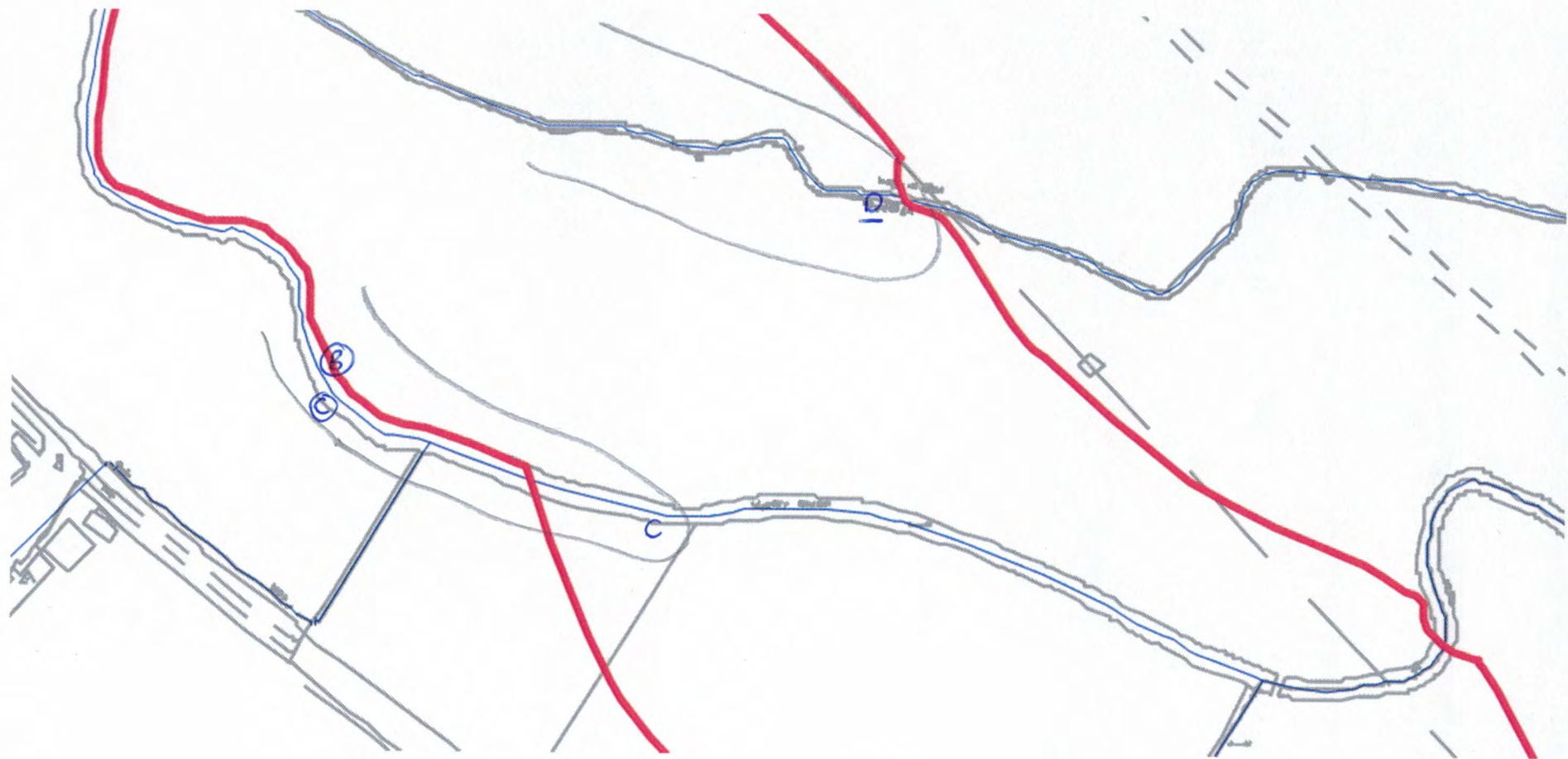
1 territory
on site
(of 2 clusters)





TRANSECT 6 MAP 1 OF 2
DUNNOCK SPECIES MAP

2 territories



TRANSECT 6 MAP 2 OF 2
DUNNOCK SPECIES MAP