



## Appendix A10.12 – Reptiles

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## **1 Introduction**

### **1.1 Background**

- 1.1.1 This Appendix reports the assessment of potential impacts on reptile populations in the vicinity of the Northern Leg of the proposed scheme, supporting Chapter 10 (Ecology and Nature Conservation).
- 1.1.2 To aid the interpretation of the assessment, the AWPR Northern Leg study area has been divided into five route sections as follows:
- Section NL1 ch314800 – 316000 (Derbeth to Tulloch Road);
  - Section NL2 ch316000 – 317400 (SAC Craibstone);
  - Section NL3 ch317400 – 322600 (A96 to Nether Kirkton);
  - Section NL4 ch322600 – 325370 (Nether Kirkton to Corsehill); and
  - Section NL5 ch325370 – 331000 (Corsehill to Blackdog).
- 1.1.3 Studies on reptiles were included as part of the Ecological Impact Assessment (EclA), and were undertaken in accordance with the Design Manual for Roads and Bridges (DMRB) Volumes 10 and 11 and the Environment Impact Assessment (Scotland) Regulations 1999. The three stages of EclA have been modified to be directly applicable to the proposed scheme, and are based on matrices from an early draft version of IEEM guidance on EclA (IEEM, 2002) and Transport Advisory Guidance (STAG and WEBTAG). The bulk of the assessment for the AWPR Northern Leg was undertaken before the 2006 issue of the IEEM guidelines. This assessment therefore follows the general approach described in the IEEM 2002 guidelines, with cognisance of the later 2006 guidelines.
- 1.1.4 These studies included desk-based consultation to collate existing information about reptile populations in the area affected by the scheme and field surveys to provide current data about the status of reptile populations.
- 1.1.5 For the purpose of this report the study area is defined as comprising all areas within 250m of the proposed scheme.

#### **Aims**

- 1.1.6 The purpose of the survey was to determine the presence and status of reptiles within the survey corridor to allow an assessment to be made of the potential impacts of the road scheme. Thus the aims of the survey were to:
- assess the presence and status of reptiles within the study area;
  - evaluate the quality of habitat present for reptiles;
  - assess possible impacts of the road development on any reptile population; and
  - identify appropriate mitigation measures and determine residual impacts.

#### **Report Structure**

- 1.1.7 This report is presented in the following structure:
- an overview of the legislative status and protection of reptile populations;
  - a summary of previous survey information;

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- the objectives and limitations of the present survey;
- survey and impact assessment methods;
- survey results and an evaluation of the area's sensitivity/importance for reptiles;
- an assessment of the potential development impacts;
- mitigation proposals are described, where and when appropriate; and
- an assessment of residual impacts of the proposed scheme following mitigation.

## **1.2 Biology**

- 1.2.1 There are six species of reptile native to Britain, including three species of lizard and three species of snake. The lizard species are the common lizard (*Lacerta vivipara*), sand lizard (*Lacerta agilis*) and slow-worm (*Anguis fragilis*) while the snake species comprise the smooth snake (*Coronella austriaca*), grass snake (*Natrix natrix*) and adder (*Vipera berus*). In addition there are several introduced species which may be encountered occasionally, arising from escapes or illegal releases (English Nature 2004).
- 1.2.2 Reptiles have a variable body temperature, which depends on the surrounding temperature and their behaviour. Reptiles move to open areas in order to bask in the sun and once a favourable temperature is reached they move off to forage.
- 1.2.3 Depending on the species' dietary needs, the habitats required may include areas of coarse grassland, scrub, woodland, or wetland areas. Generally lizards feed on invertebrates such as insects, and snakes feed on vertebrates, such as amphibians and small mammals. Reptiles also require refuges and hibernacula, such as well-vegetated areas, piles of rubble and logs. Suitable habitats will allow reptiles' access to breeding, feeding and hibernating areas (English Nature 2004).
- 1.2.4 In Scotland, adders are most frequently recorded on dry moorland (23%), followed by wet moorland, rough grazing, and bracken (c.13% each), but least frequently from broadleaf woodland and coastal areas (Reading et al 1995).
- 1.2.5 Much of Scotland has suitable habitat for the common lizard, which prefers varied lowland areas and steep mountain slopes in upland areas, but seems to avoid arable and mixed farmland. The slow-worm is sparsely but widely distributed throughout most of Scotland, but most commonly in the western highlands.
- 1.2.6 Most species of British reptiles give birth to live young with the exception of the sand lizard and grass snake, which lay eggs. Breeding takes place when external heat sources are at a maximum, and therefore late spring and summer are favoured (Griffiths & Beebee, 2000). Reptiles generally lay their eggs or produce their young in places with a source of warmth, such as compost heaps, piles of manure or sandy areas that are not totally shaded from sunlight.
- 1.2.7 Smooth snakes and sand lizards are very rare in the UK and are confined mainly in the south and northwest (sand lizard only) of England on sand dunes and sandy heaths. The grass snake is common throughout most of southern England but much rarer further north, and does not extend into Scotland apart from a few isolated records that are probably due to introductions. Subsequently these species are not discussed further in this report.
- 1.2.8 The common lizard, slow-worm and adder are widespread throughout Scotland (Reading et al., 1995; Reading et al., 1996). The adder is apparently present throughout much of Scotland (apart from the Central Belt, Fife, the Outer Hebrides, the Northern Isles, and much of the mountainous region between Inverness and Glasgow). These three species are the only species likely to occur in the Aberdeen area (Arnold, 1995). All three species are frequently recorded in parts of Deeside (Mrs Geraldine McGowan, Northern Ecological Services, pers.comm.).

### **1.3 Status**

- 1.3.1 Common lizard, slow-worm and adder are fairly common and widespread in Britain and receive limited protection under the Wildlife and Countryside Act (1981) (as amended), which makes it an offence to intentionally/recklessly kill or injure these animals. The Act was amended by the Nature Conservation (Scotland) Act 2004 which added the word 'recklessly' to the previous legislation.
- 1.3.2 Common lizard, slow-worm and adders are not included in the national or the North East Scotland Biodiversity Action Plan (BAP) although adders are listed as a Species of Conservation Concern (UK BAP 2000).

## **2 Approach and Methods**

### **2.1 Existing Data**

- 2.1.1 A desk-based study was undertaken and comprised a review of all available data. This included consultations with relevant statutory bodies and local interest groups including:
- Scottish Natural Heritage (SNH),
  - North East Scotland Biological Records Centre (NESBReC);
  - University of Aberdeen; and
  - Internet sources (e.g. National Biodiversity Network).

### **2.2 Survey Methods**

#### **Habitat Assessment**

- 2.2.1 A preliminary habitat assessment was made of the entire AWPR route using 1:25,000 scale Ordnance Survey maps to identify areas of habitat that had the potential to support reptiles within a corridor 250m either side of the proposed scheme.
- 2.2.2 Walkover surveys of each habitat area were undertaken to refine the number of sites that would be surveyed for reptiles. These walkover surveys identified 26 sites that were assessed as supporting suitable reptile habitat within the direct footprint of the AWPR (hereafter referred to as RPH 1-26).
- 2.2.3 This assessment was based on habitat type, basking and foraging opportunities and linkages to other areas of potential reptile habitat. The quality of the reptile habitat was assessed using the following criteria:
- **High** – Suitable vegetation cover offering foraging opportunities, basking sites and a variety of refugia. With good linkages with other areas of reptile habitat, (e.g. semi - improved grassland with areas of dense continuous scrub).
  - **Moderate** – Some suitable vegetation cover offering foraging opportunities, basking sites and refugia, with limited linkages to other areas of suitable reptile habitat, (e.g. dense continuous scrub with short improved grassland surrounding).
  - **Low** – Poor quality or inappropriate vegetation cover with no linkages to other areas of suitable reptile habitat, (e.g. mature conifer plantation).

### **Reptile Refuge Survey**

- 2.2.4 Artificial refugia were laid out at a density of 50/ha within each of the areas of suitable reptile habitat identified during the Habitat Assessment. A total of 140 carpet tiles and 70 roofing felt tiles were divided amongst the 26 identified reptile habitat sites within the route alignment.
- 2.2.5 The tiles were allowed to bed down for 10 days before being checked on six occasions for the presence of reptiles basking, seeking shade or using the tiles as refugia. The refugia survey was carried out between the hours of 08:00-11:00 and 17:00-19:30 as these are the optimum times to view basking reptiles.
- 2.2.6 The above methodology follows DMRB guidance on Reptiles and Roads (Highways Agency 2001).

### **Dates of Survey**

- 2.2.7 The walkover surveys to identify areas of suitable reptile habitat were undertaken during the final week of March 2004. Tiles were placed *in situ* on the 28 June 2004 and were checked for the presence of reptiles on the 9, 10, 21 and 22 July, and 3 and 4 of August 2004. The survey results were reviewed against the current design, and no further surveys were considered necessary to undertake this assessment.

## **2.3 Survey Limitations**

- 2.3.1 Reptile surveys were carried out at a sub-optimal time of year, the optimal time being April-June and then between August - October. However, reptiles are still active outside these periods, but are harder to detect due to reduced basking activity.
- 2.3.2 The weather was particularly cold during the parts of the survey period, which would have reduced the level of reptile activity. This would have reduced the effectiveness of using artificial refugia as a survey technique as reptiles are less likely to bask in the absence of direct sunlight, and in cold temperatures.
- 2.3.3 However 50% of the survey visits were carried out in optimal conditions, therefore it is likely that the presence/absence of reptiles would have been detected.
- 2.3.4 Between 5% and 10% of tiles had been disturbed, reducing the effectiveness of the survey methodology and making reptiles less likely to use the artificial refugia.

## **2.4 Evaluation of Ecological Importance**

### **Evaluation of Receptors**

- 2.4.1 The method for assessing the value of an ecological receptor uses all information collated in determining the baseline status of the resource. The ecological evaluation of a receptor is determined by reference to statutory and non-statutory site designations, the results of consultation, literature review and field surveys. The evaluation method incorporates a geographical framework where ecological receptors are assessed according to a series of criteria that are presented in Table 1 which are based on the Ratcliffe Criteria (Ratcliffe 1977) used in the selection of biological Sites of Special Scientific Interest (SSSI) and include size (extent), naturalness, rarity, typicality, vulnerability and position in an ecological / geographical unit.
- 2.4.2 The evaluation method additionally includes reference to the legal protection conferred on species or habitats as well as the conservation status of the receptor, such as presence of national or local BAPs. These factors give rise to a level of conservation importance being assigned to species/habitats that reflects the geographical framework used in the evaluation process. Thus, for

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example species such as otters and bats are protected by international legislation, are referred to as internationally important in terms of their conservation status. Other species such as wych elm, which are identified as priority species in the North-East Scotland BAP are referred to as regionally important species.

**Evaluation of Features and/or Habitat Areas**

2.4.3 The ecological evaluation of a feature or area of habitat takes into account the level of conservation importance of the species, as well as other factors such as the level of use of the habitat or feature by a species, whether the species or habitat is locally or regionally common or rare, as well as other criteria that contribute to a feature's importance. In this way, the method of evaluation provides a system that combines legislative protection of species and/or habitats and conservation parameters that all contribute to the ecological importance of the receptor.

**Table 1 – Evaluation of Ecological Receptor**

<b>Value/Importance</b>	<b>Criteria</b>
<b>International</b> (European)	<p><u>Habitats</u>            An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, Ramsar site, Biogenetic/Biosphere Reserve, World Heritage Site) or an area which would meet the published selection criteria for designation. A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any river classified as excellent A1 and likely to support a substantial salmonid population. Any river with a Habitat Modification Score indicating that it is Pristine or Semi-Natural or Obviously Modified.</p> <p><u>Species</u>            Any regularly occurring population of internationally important species, threatened or rare in the UK. i.e. a UK Red Data Book species categories 1&amp; 2 of UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP. A regularly occurring, nationally significant population/number of an internationally important species.</p>
<b>National</b> (Scottish)	<p><u>Habitats</u>            A nationally designated site (SSSI, ASSI, NNR, Marine Nature Reserve) or a discrete area which would meet the published selection criteria for national designation (e.g. SSSI selection guidelines). A viable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat essential to maintain wider viability. Any river classified as excellent A1 and likely to support a substantial salmonid population. Any river with a Habitat Modification Score indicating that it is Pristine or Semi-Natural or Obviously Modified.</p> <p><u>Species</u>            A regularly occurring, regionally or county significant population/number of an internationally/nationally important species. Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (see local BAP). A feature identified as of critical importance in the UK BAP.</p>
<b>Regional</b> (North East Scotland)	<p><u>Habitats</u>            Sites which exceed the County-level designations but fall short of SSSI selection criteria. Viable areas of key habitat identified in the Regional BAP or smaller areas of habitat essential to maintain wider viability. Viable areas of key habitat identified as of Regional value in the appropriate SNH Natural Heritage Future area profile. Any river classified as excellent A1 or good A2 and capable of supporting salmonid population. Any river with a Habitat Modification Score indicating that it is significantly modified or above.</p> <p><u>Species</u>            Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10 km squares in the UK or in a Regional BAP or relevant SNH Natural Heritage Future area on account of its regional rarity or localisation. A regularly occurring, locally significant population/number of a regionally important species. Sites maintaining populations of internationally/nationally important species that are not threatened or rare in the region or county.</p>
<b>Authority Area</b> (e.g. County or District) Aberdeenshire/ City of Aberdeen	<p><u>Habitats</u>            Sites recognised by local authorities (e.g.) District Wildlife Sites (DWS) and Sites of Interest for Nature Conservation (SINS). County/District sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves (LNR). A viable area of habitat identified in County/District BAP or in the relevant SNH Natural Heritage Future area profile. A diverse and/or ecologically valuable hedgerow network. Semi-natural ancient woodland greater than 0.25 ha. Any river classified as good A2 or fair B and likely to support coarse fishery. Any river with a Habitat Modification Score indicating that it is significantly modified or above.</p>

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Value/ Importance	Criteria
	<p><u>Species</u>            Any regularly occurring, locally significant population of a species listed in a County/District BAP due to regional rarity or localisation. A regularly occurring, locally significant population of a County/District important species. Sites supporting populations of internationally/nationally/regionally important species that are not threatened or rare in the region or county, and not integral to maintaining those populations. Sites/features scarce in the County/District or which appreciably enrich the County/District habitat resource</p>
<p><b>Local</b>            (immediate area or local village importance)</p>	<p><u>Habitats</u>            Areas of habitat that appreciably enrich the local habitat resource (e.g. species-rich hedgerows, ponds etc). Sites that retain other elements of semi-natural vegetation that due to their size, quality or the wide distribution within the local area are not considered for the above classifications. Semi-natural ancient woodland smaller than 0.25 ha. Any river classified as fair B or poor C and unlikely to support coarse fishery. Rivers with a Habitat Modification Score indicating that it is severely modified or above.</p> <p><u>Species</u>            Populations/assemblages of species that appreciable enrich the biodiversity resource within the local context. Sites supporting populations of county/district important species that are not threatened or rare in the region or county, and are not integral to maintaining those populations.</p>
<p><b>Less than Local</b>            (Limited ecological importance)</p>	<p>Sites that retain habitats and/or species of limited ecological importance due to their size, species composition or other factors. Any river classified as impoverished D and/or and with a Habitat Modification Score indicating that it is severely modified.</p>

**2.5 Impact Assessment**

2.5.1 In the assessment of significance of impact, consideration has been given both to the magnitude of impact and to the sensitivity of the receiving environment or species (receptor). For this assessment the sensitivity of a receptor (watercourse and the ecosystem it supports) was determined with reference to its level of ecological importance although other elements (e.g. presence of protected species) have been taken into account where appropriate.

Impact Magnitude

2.5.2 Methods of impact prediction used included direct measurements, correlations, expert opinion and information from previous developments. Impacts include those that are predicted to be direct, indirect, temporary, permanent, cumulative, reversible or irreversible. The magnitude of each impact was assessed independently of its value or statutory status. Magnitude criteria are presented in Table 2.



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**Table 2 – Impact Magnitude**

Impact Magnitude	Criteria
High negative	The change is likely to permanently, adversely affect the integrity of an ecological receptor, in terms of the coherence of its ecological structure and function, across its whole area that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest.
Medium negative	The change is not likely to permanently adversely affect the ecological receptor's integrity but the effect on the receptor is likely to be substantial in terms of its ecological structure and function and may be significant in terms of its ecological objectives. Likely to result in changes in the localised or temporary distribution of a species but not affect its population status at a regional scale or permanently.
Low negative	The change may adversely affect the ecological receptor, but there will probably be no permanent effect on its integrity and/or key attributes and is unlikely to be significant in terms of its ecological objectives.
Negligible	The change may slightly adversely affect the receptor but will have no permanent effect on the integrity of the receptor or its key attributes. There are no predicted measurable changes to the species assemblage or population and the effect is unlikely to result in an increased vulnerability of the receptor to future impacts.
Positive	The change is likely to benefit the ecological receptor, and/or enhance the biodiversity resource of the receptor.
High positive	The change is likely to restore an ecological receptor to favourable conservation status, contribute to meeting BAP objectives (local and national) and/or create a feature that is of recognisable value for biodiversity.

Impact Significance

2.5.3 The significance of impact was determined according to the matrix system illustrated in Table 3.

**Table 3 – Impact Significance**

Magnitude Importance	High Negative	Medium Negative	Low Negative	Negligible	Positive	High Positive
<b>International</b>	Major	Major	Moderate	Negligible	Moderate	Major
<b>National</b>	Major	Major	Moderate	Negligible	Moderate	Major
<b>Regional</b>	Major	Moderate	Minor	Negligible	Minor	Moderate
<b>County</b>	Moderate	Moderate	Minor	Negligible	Minor	Moderate
<b>Local</b>	Minor	Minor	Minor	Negligible	Minor	Minor
<b>Less than Local</b>	Minor	Negligible	Negligible	Negligible	Negligible	Negligible

2.5.4 The level of significance of impacts predicted on ecological receptors is an important factor in influencing the decision-making process and determining the necessity and/or extent of mitigation measures. Impacts can be beneficial or adverse, either improving or decreasing the ecological status, health or viability of a species, population or habitat. In general, impact significance greater than or equal to Moderate would require specific mitigation to be undertaken to ameliorate it to acceptable levels.

### **3 Baseline**

#### **3.1 Data Search**

3.1.1 The only reptile species recorded within 50km of Aberdeen are the common lizard, slow-worm and adder (Arnold, 1995; Reading et al., 1995; Reading et al., 1996).

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- 3.1.2 A questionnaire survey carried out during 1992 recorded adders in all the 10km grid squares around Aberdeen, common lizards in NO88, 89 and 98, but there were no records of slow-worms east of NO79 (Reading et al., 1995; Reading et al., 1996). In the questionnaire survey, key changes in land use over time were perceived to be afforestation, changes in agricultural practices and loss of habitat and disturbance due to recreation and/or development (Reading et al 1995). These factors may also have affected the distribution of reptiles in the Aberdeen area during the last fifteen years.
- 3.1.3 A review of information from internet sources such as the National Biodiversity Network ([www.nbn.org.uk](http://www.nbn.org.uk)) revealed no records of reptiles within any of the 10km grid squares through which the proposed scheme would pass..

## 3.2 Survey Results

### Survey Conditions

- 3.2.1 Dates of survey and general temperatures on those dates are detailed in Table 4.

**Table 4 – Reptile Survey Conditions**

Date	Survey Session	Temperature (°c)	Survey Conditions	
			Sub-optimal	Optimal
9 July	1 <sup>st</sup>	11-12	√	
9 July	2 <sup>nd</sup>	11-12	√	
10 July	1 <sup>st</sup>	10	√	
21 July	1 <sup>st</sup>	17-19		√
21 July	2 <sup>nd</sup>	18-19		√
22 July	1 <sup>st</sup>	16-18		√
22 July	2 <sup>nd</sup>	16-18		√
3 August	1 <sup>st</sup>	15-16	√	
3 August	2 <sup>nd</sup>	15-16	√	
4 August	1 <sup>st</sup>	16-18		√

### Section NL1 ch314800 – 316000 (Derbeth to Tulloch Road)

#### Habitat Assessment

- 3.2.2 The location of reptile habitat areas (RPH) surveyed and an assessment of their suitability to support reptile populations is shown in Table 5.

**Table 5 – Section NL1: Reptile Habitat Suitability Assessment**

Reptile Habitat Area	Grid Ref.	Habitat Type	Overall Quality of Habitat for Reptiles
RPH1	NJ 867 087	Mixed plantation and scrub with arable and improved grassland adjacent.	Low
RPH2	NJ 861 089	Scrub adjacent to improved grassland	Moderate

#### Refugia Search

- 3.2.3 No reptiles were recorded in Section NL1.

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**Section NL2 ch316000 – 317400 (SAC Craibstone)**

3.2.4 The location of reptile habitat areas (RPH) surveyed and an assessment of their suitability to support reptile populations is shown in Table 6.

**Table 6 – Section NL2: Reptile Habitat Suitability Assessment**

Reptile Habitat Area	Grid Ref.	Habitat Type	Overall Quality of Habitat for Reptiles
RPH3	NJ 869 101	Amenity grassland next to burn/ditch.	Moderate
RPH4	NJ 867 109	Edge of mixed plantation in improved grassland.	Low
RPH5	NJ 868 111	Edge of mixed plantation in improved grassland.	Low

Refugia Search

3.2.5 No reptiles were recorded in Section NL2.

**Section NL3 ch317400 – 322600 (A96 to Nether Kirkton)**

3.2.6 The location of reptile habitat areas (RPH) surveyed and an assessment of their suitability to support reptile populations is shown in Table 7.

**Table 7 – Section NL3: Reptile Habitat Suitability Assessment**

Reptile Habitat Area	Grid Ref.	Habitat Type	Overall Quality of Habitat for Reptiles
RPH6	NJ 860 126	Acid grassland adjacent to Coniferous Plantation and scrub	High
RPH7	NJ 858 127	Woodland Plantation Edge	Low
RPH8	NJ 858 131	Woodland Plantation Edge with improved grassland and arable adjacent.	Low
RPH9	NJ 857 133	Acid grassland bounded by woodland plantation	Moderate
RPH10	NJ 857 135	Coniferous Plantation	Low
RPH11	NJ 858 136	Coniferous Plantation	Low
RPH12	NJ 856 139	Woodland Plantation Edge	Low
RPH13	NJ 860 144	Semi-improved grassland with adjacent woodland and scrub	Moderate

Refugia Search

3.2.7 No reptiles were recorded in Section NL3.

**Section NL4 ch322600 – 325370 (Nether Kirkton to Corsehill)**

3.2.8 The location of reptile habitat areas (RPH) surveyed and an assessment of their suitability to support reptile populations is shown in Table 8.

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**Table 8 – Section NL4: Reptile Habitat Suitability Assessment**

Reptile Habitat Area	Grid Ref.	Habitat Type	Overall Quality of Habitat for Reptiles
RPH14	NJ 880 148	Coniferous plantation surrounded by semi-improved grassland	Moderate
RPH15	NJ 882 149	semi-improved grassland	Moderate
RPH16	NJ 891 151	Riparian habitat	Moderate
RPH17	NJ 893 149	Coniferous plantation and Bracken habitat surrounded by semi-improved grassland.	High
RPH18	NJ 894 149	Semi-improved grassland on disused railway	High
RPH19	NJ 895 153	Semi-improved grassland, tall ruderal and bracken on disused railway.	High

Refugia Search

3.2.9 No reptiles were recorded in Section NL4.

**Section NL5 ch325370 –331000 (Corsehill to Blackdog)**

3.2.10 The location of reptile habitat areas (RPH#) surveyed and an assessment of their suitability to support reptiles populations are shown in Table 9.

**Table 9 – Section NL5: Reptile Habitat Suitability Assessment**

Reptile Habitat Area	Grid Ref.	Habitat Type	Overall Quality of Habitat for Reptiles
RPH20	NJ 908 153	Coniferous Plantation	Low
RPH21	NJ 910 152	Arable field Margin	Low
RPH22	NJ 916 149	Scattered and dense continuous Scrub surrounded by semi improved grassland	High
RPH23	NJ 923 148	Riparian habitat adjacent to marshy grassland.	Moderate
RPH24	NJ 917 154	Tall non-ruderal herb vegetation adjacent to coniferous plantation.	Moderate
RPH25	NJ 903 151	Field Improved grassland field margin.	Low
RPH26	NJ 903 153	Coniferous plantation	Low

Refugia Search

3.2.11 No reptiles were recorded in Section NL5.

**Summary**

3.2.12 The suitable areas of reptile habitat surveyed in Sections NL1 – NL5 ranged from semi-improved grassland with tall ruderal vegetation (High suitability), semi-improved marshy grassland (moderate suitability) habitat to conifer plantation (low suitability).

3.2.13 Reptiles were not recorded within any of the five sections during refuge surveys.

## **4 Evaluation**

4.1.1 Evaluations in this section are based on habitat suitability in relation to reptiles, the numbers of reptiles and the overall importance of the survey area to reptiles within a wider landscape context.

### **Section NL1 ch314800 – 316000 (Derbeth to Tulloch Road)**

4.1.2 Section NL1 is evaluated as being of **less than local** importance for reptiles. The reasons for this level of evaluation are as follows:

- no reptiles recorded during the refugia survey;
- suitable habitats identified for survey are of low to moderate suitability for reptiles;
- low number of suitable survey sites within route corridor; and
- RPH1 and RPH2 are isolated from each other and other areas of suitable areas of reptile habitat within the wider landscape outside route corridor.

### **Section NL2 ch316000 – 317400 (SAC Craibstone)**

4.1.3 Section NL2 is evaluated as being of **local** importance for reptiles. The reasons for this level of evaluation are as follows:

- no reptiles recorded during refugia survey;
- suitable habitats identified for survey are of low to moderate suitability for reptiles;
- low number of suitable survey sites within route corridor; and
- RPH 3-5 have good linkages to other areas of suitable reptile habitats within Section NL2, notably along Gough Burn and adjacent riparian habitats.

### **Section NL3 ch317400 – 322600 (A96 to Nether Kirkton)**

4.1.4 Section NL3 is evaluated as being of **local** importance for reptiles. The reasons for this level of evaluation are as follows:

- no reptiles recorded during refugia survey;
- suitable habitats identified for survey are of low to high suitability for reptiles;
- high number of suitable survey sites within route corridor;
- RPH 6-13 are relatively clustered within Section NL3 therefore reducing isolation between pockets of suitable reptile habitat; and
- good linkages to others areas of suitable reptile habitats within Section NL3, notably along Bogenjoss Burn and adjacent riparian habitats.

### **Section NL4 ch322600 – 325370 (Nether Kirkton to Corsehill)**

4.1.5 Section NL4 is evaluated as being of **local** importance for reptiles. The reasons for this level of evaluation are as follows:

- no reptiles recorded during refugia survey;
- suitable habitats identified for survey are of moderate to high suitability for reptiles;
- high number of suitable survey sites within route corridor;

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- RPH 16-19 are relatively clustered within Section NL3 therefore reducing isolation between pockets are suitable reptile habitat; and
- good linkages to other areas of suitable reptile habitats within Section NL4, notably along the River Don, Goval Burn and adjacent riparian habitats.

**Section NL5 ch325370 – 331000 (Corsehill to Blackdog)**

4.1.6 Section NL5 is evaluated as being of **local** importance for reptiles. The reasons for this level of evaluation are as follows:

- no reptiles recorded during refugia survey;
- suitable habitats identified for survey are of low to high suitability for reptiles;
- high number of suitable survey sites within route corridor;
- good linkages to others areas of suitable reptile habitats within Section NL5, notably along field drains, Red Moss Burn and adjacent riparian habitats.

**Summary**

4.1.7 In total approximately 0.19km<sup>2</sup> of habitat of low to high suitability for reptiles was surveyed over Sections NL1-NL5 within the route alignment. The negative results from both consultation and survey indicate that reptiles are either absent or occur at low population densities throughout the route alignment. Therefore Sections NL1-NL5 are evaluated as being of overall **local** ecological importance for reptiles.

## **5 Potential Impacts**

### **5.1 Generic Impacts**

#### **Direct Mortality**

##### Construction

5.1.1 Reptiles may be killed during the construction phase of the road through site clearance and excavations as well as being run-over by construction vehicles.

##### Operation

5.1.2 During the operational phase there is the potential for mortality through reptiles basking on the roadside or attempting to cross the road and subsequently being run-over.

#### **Habitat Loss**

##### Construction and Operation

5.1.3 Habitat loss is likely to have a potentially adverse impact on reptiles where the construction of the road would result in the destruction of areas supporting suitable reptile habitat, in particular, areas with a high to moderate suitability for reptiles. Although this habitat loss would occur during the construction phase of the scheme, it is regarded as an operational impact since this habitat loss would be permanent. However, temporary habitat loss, for example through the siting of site compounds and storage areas are impacts associated with the construction phase of the road.

### **Habitat Fragmentation and Isolation**

#### Construction

- 5.1.4 Construction of the road would potentially result in areas of good reptile habitat being severed, therefore fragmenting and isolating any remaining potential reptile populations. Temporary habitat fragmentation and isolation may occur through the siting of construction compounds and as such is considered a construction impact.

#### Operation

- 5.1.5 No additional habitat loss is envisaged during operation of the proposed scheme other than that associated with routine operational maintenance of roadside verge or similar areas. For specific habitat loss information refer to the Terrestrial Habitats report in Appendix A10.1.

### **Disturbance**

#### Construction and Operation

- 5.1.6 During the construction phase of the road, vibrations from machinery and large vehicles are likely to disturb reptiles and deter them from residing in habitats adjacent to the areas of disturbance. The storage of construction materials in sensitive areas in addition to removing debris such as logs and rubble would also constitute disturbance to reptiles, the effects of which could be particularly detrimental if carried out during the breeding season or when reptiles are hibernating.

### **Pollution and Other Indirect Impacts**

#### Construction and Operation

- 5.1.7 There is the risk of accidental spillages occurring during the construction and operational phases. Runoff from the operational road may also contain pollutants such as cadmium or copper in addition to petrochemical derived substances. These events have the potential to kill reptiles both directly and indirectly. Reptiles may come into contact with pollutants and die or their prey may be reduced, leading to starvation.

## **5.2 Specific Potential Impacts**

### **Section NL1 ch314800 – 316000 (Derbeth – Tulloch Road)**

#### Direct Mortality

- 5.2.1 RPH1 would be directly affected by construction activities and the operational carriageway at North Kingswells Junction in Section NL1. However no reptiles were recorded in this area and the suitability of RPH1 for reptiles is low. The habitat is of less than local ecological value so not expected to be of importance to reptiles, and the chance of reptile presence is low. Therefore potential direct mortality is assessed as being of **Negligible** magnitude and significance.

#### Habitat Severance/Loss

- 5.2.2 The proposed scheme would result in the partial loss of an area of low suitability reptile habitat (RPH1) (refer to Table 11 in the Terrestrial Habitats report (Appendix A10.1) for information regarding specific habitat loss). The operational phase of the main carriageway to the west of RPH1 would increase severance effects and further isolate suitable areas of reptile habitats within

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Section NL1. However no reptiles were recorded therefore habitat severance/loss is assessed as being of low negative potential magnitude with an impact significance of **Negligible**.

Disturbance/Pollution

- 5.2.3 The effects of disturbance and pollution are unlikely to result in an observable impact on the reptile populations, as the populations are already small and isolated if present. This potential impact is therefore considered to be of **Negligible** magnitude and significance.

**Section NL2 ch316000 – 317400 SAC Craibstone**

Direct Mortality

- 5.2.4 Two areas of low suitability reptile habitat (RPH4 and RPH5) would be directly affected by construction activities by means of the main AWPR carriageway and the A96 Junction. However, no reptiles were recorded in this area and the suitability of RPH4 and RPH5 for reptiles is low. Therefore direct mortality of reptiles is unlikely but due to their cryptic nature populations of reptiles may have been unrecorded and present in these areas. Therefore, potential for direct mortality is assessed as being of low negative magnitude and **Minor** significance.

Habitat Severance/Loss

- 5.2.5 The road construction within Section NL2 would result in the total permanent loss of RPH5 (south of the A96 Junction) and the partial loss of habitat within RPH4. In addition RPH3 would not be directly impacted by road construction however RPH3 and 4 would be affected by the operational scheme, through severance of likely dispersal routes between Green Burn and Gough Burn and associated riparian habitats. The Terrestrial Habitats report (Appendix A10.1) provides information regarding specific habitat loss.
- 5.2.6 No reptiles were recorded in Section NL2 therefore the effects of habitat loss/severance would be unlikely to result in an observable impacts. Habitat loss/severance as a result of this is assessed as being of low negative potential magnitude with an impact significance of **Minor**.

Disturbance/Pollution

- 5.2.7 The effects of disturbance and pollution are unlikely to result in an observable positive or negative impact on the reptile populations, as the populations are already small and isolated if present. This potential impact is therefore considered to be of **Negligible** magnitude and significance.

**Section NL3 ch317400 – 322600 (A96 – Nether Kirkton)**

Direct Mortality

- 5.2.8 RPH 7-13 would be directly impacted by road construction. These areas comprise habitats that are of low to high suitability for reptiles; however no reptiles were recorded in Section NL3. The direct mortality of reptiles is unlikely in areas of poor habitat but small populations may be present. Activities relating to the construction of the proposed scheme may result in the direct mortality of reptiles within these areas. Therefore, potential for direct mortality is assessed as being of low negative magnitude and **Minor** significance.

Habitat Severance/Loss

- 5.2.9 The road construction within Section NL3 would result in the total or partial loss of seven areas of reptile habitat (RPH7-13) of low to moderate suitability for reptiles. This permanent loss of potentially suitable habitat, the operational scheme would as a consequence increase severance issues. However no reptiles were recorded in Section NL3, therefore habitat loss/severance as a



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result of this is assessed as being of low negative potential magnitude with an impact significance of **Minor**.

Disturbance/Pollution

- 5.2.10 The effects of disturbance and pollution would be unlikely to result in an observable impact on the reptile populations, as the populations are already small and isolated if present. This potential impact is therefore considered to be of **Negligible** magnitude and significance.

**Section NL4 ch322600 – 325370 (Nether Kirkton – Corsehill)**

Direct Mortality

- 5.2.11 Road construction within Section NL4 would directly impact on RPH15, RPH17 and RPH18, which are of moderate to high suitability for reptiles; however no reptiles were recorded in Section NL4. Reptiles are still likely to be present in areas of good habitat quality even if it is in small numbers, and therefore would be vulnerable to injury and death during the construction of the proposed scheme. Potential for direct mortality is assessed as being of medium negative magnitude and **Minor** significance.

Habitat Severance/Loss

- 5.2.12 Road construction within Section NL4 would result in the loss of three areas of moderate to high suitability reptile habitat (RPH15, RPH17 and RPH18). In addition linkages to areas of moderate to high suitability reptile habitat would be severed by the road construction and the operational carriageway. Therefore habitat severance/loss is assessed as being of medium negative magnitude potential impact with an impact significance of **Minor**.

Disturbance/Pollution

- 5.2.13 The effects of disturbance and pollution would be unlikely to result in an observable impact on the reptile populations in Section NL4, as the populations are already small and isolated if present. This potential impact is therefore considered to be of **Negligible** magnitude and significance.

**Section NL5 ch325370 – 331000 Corsehill – Blackdog**

Direct Mortality

- 5.2.14 Road construction within Section NL5 would result in the partial loss of RPH21, RPH22, RPH23 and 25. Both RPH21 and 25 are of low suitability. However, RPH 22 is of high suitability for reptiles while RPH23 is of moderate suitability for reptiles.
- 5.2.15 No reptiles were recorded in Section NL5 but despite this, reptiles are still likely to be present in small numbers due to the habitat quality, and would therefore be vulnerable to injury during construction. Therefore, potential for direct mortality is assessed as being of medium negative magnitude and **Minor** significance.

Habitat Severance/Loss

- 5.2.16 The operational scheme in Section NL5 would result in the partial loss of four out of the seven suitable areas of reptile habitats surveyed. However during the operational phase of the road, habitat linkages between suitable reptile habitats on the south side of the road and those on the north side would be severed. Due to the lack of reptiles found during this survey, habitat severance/loss is assessed as being a medium negative potential impact with an impact significance of **Minor**.

Disturbance/Pollution

- 5.2.17 The effects of disturbance and pollution would be unlikely to result in an observable impact on the reptile populations, as the populations are already small and isolated if present. This potential impact is therefore considered to be of **Negligible** magnitude and significance.

## **6 Mitigation**

### **6.1 Introduction**

- 6.1.1 As no reptiles were recorded during the 2004 field survey throughout Sections NL1-NL5, a precautionary approach has been adopted that assumes reptile presence where there is moderate to high suitability habitat.
- 6.1.2 As no impacts will constitute impact significance greater than Minor, generic mitigation measures applied across the whole of the proposed scheme are considered to be sufficient to mitigate for potential impacts identified.
- 6.1.3 As all reptiles are protected from intentional/reckless killing and injury under the WCA (1981) (as amended) and the Nature Conservation (Scotland) Act (2004), a 'best practice' approach to pre-construction site clearance is required to prevent mortality of reptiles due to the proposed scheme and to avoid any offences occurring should reptiles be present. These are described in more detail below.

#### **Generic Mitigation**

Direct Mortality

- 6.1.4 Areas that have been identified as being suitable to reptiles that would be lost or bisected by the proposed scheme will be made unsuitable for reptiles through destructive searching, thereby discouraging reptiles from using these areas and reducing the likelihood of fatalities. This requires vegetation to be strimmed and removed under the supervision of an Ecological Clerk of Works. Removal of vegetation should ideally be undertaken during March-October when reptiles will be least affected.
- Prior to strimming any natural/artificial reptile refugia must be removed if possible, to an area outside that directly affected.
  - The first cut must reduce vegetation to a minimum height of 150mm. The strimmed areas should then be left for at least 24 hours so that any reptiles present can safely move out of the area.
  - A second cut will reduce the vegetation to a maximum of 20mm above ground level.
  - The arisings should be removed from the site and placed in an area not affected by the construction of the road.
- 6.1.5 A qualified herpetologist(s) will attempt to capture any reptiles that remain and release them into similar suitable habitats elsewhere or in sites already identified but not affected by the scheme. Ideally, any reptiles caught should be released into areas adjacent or very close to their site of origin.
- 6.1.6 The above activities will only be carried out after consultation with SNH to agree an appropriate methodology.

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Habitat Loss

- 6.1.7 Mitigation proposals prescribed to offset for impacts on other ecological receptors are likely to mitigate for habitat loss on reptiles; through compensatory planting and landscaping of road verges, and additional habitat creation areas.

Habitat Fragmentation and Isolation

- 6.1.8 Mitigation proposals prescribed to offset for impacts on other ecological receptors are likely to mitigate for fragmentation and severance on reptiles; through compensatory planting and landscaping of road verges, and additional habitat creation areas.

Disturbance

- 6.1.9 Disturbance to reptiles during the construction phase would be unavoidable, although this can be reduced through siting construction compounds and storage areas away from high value terrestrial habitat. All plant and personnel should be restricted to working within a prescribed working corridor.

Pollution and Other Indirect Impacts

- 6.1.10 Best practice will be followed during construction, including SEPA Pollution Prevention Guidelines PPG1, PPG3 and PPG5.
- 6.1.11 During operation, effective drainage systems will minimise the impacts of road run-off and reduce the risk and impact of spill events as explained in ES Chapter 9 (Water Environment).
- 6.1.12 Drainage systems will include features to divert runoff into drains, soak-aways and balancing ponds thus avoiding contamination of watercourses.

## **7 Residual Impacts**

Direct Mortality

- 7.1.1 With proposed mitigation, the construction phase of the proposed scheme should not compromise the long-term survival of any reptiles that may be present. Some reptiles may go un-detected during destructive searches and may therefore be injured or killed. It is however highly unlikely that large numbers of reptiles would be affected. The magnitude associated with the loss of these individuals is considered as negligible, and the significance of the residual impact as **Negligible**. It would be impractical to prevent reptiles from basking on or attempting to cross the operational road and therefore some fatalities may occur.

Habitat Loss

- 7.1.2 The creation of suitable habitat on south facing road embankments, and the inclusion of refugia/hibernacula in to the final design would compensate for the loss of habitat. The magnitude associated with the loss of habitat would be reduced to negligible and the significance of the residual impact to **Negligible**.

Habitat Fragmentation and Isolation

- 7.1.3 Habitat creation identified to mitigate for impacts on other ecological receptors is likely to also mitigate for fragmentation and severance on reptiles. It is therefore unlikely that there would be any observable impacts on the reptile populations and therefore the magnitude and significance of this residual impact is assessed as being **Negligible**.

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Disturbance

- 7.1.4 Noise/vibration generated from the construction and operational phase of the road is unlikely to cause disturbance to reptiles as they would habituate to these effects in the long term. Reptiles found during destructive searching would suffer from some disturbance while being translocated although this will be of negligible magnitude, as they will be immediately released into new habitat. Both the magnitude and significance of residual impact associated with disturbance is considered as **Negligible**.

Pollution and Other Indirect Impacts

- 7.1.5 The implementation of the mitigation proposed in Chapter 9 (Water Environment) would ensure that no pollutants escape into reptile habitat and therefore the magnitude and significance of residual impact associated with these is assessed as **Negligible**.

**Residual Impacts Summary**

- 7.1.6 If the recommendations of this report are fully implemented, the construction and operation of the road is not predicted to compromise the long-term survival of reptile populations in the study area.

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## **9 Glossary of Terms**

Acid Grassland – grassland that occurs on acidic soils (pH less than 5.5). Often species poor.

Afforestation – planting of new trees in an area that previously didn't have any. Mainly for commercial reasons. The trees are nearly always coniferous.

Artificial Refuge – normally a sheet of corrugated metal, carpet tile or other material that is placed on site and checked for reptiles. Reptiles use the artificial refuge to bask under or on top of because they warm up quickly, retain heat and provide shelter.

Basking Site - an area where the reptile can warm up either directly in sunlight or under something that is in direct sunlight.

Broadleaved Woodland – an area of woodland with predominantly deciduous tree species (less than 10% coniferous trees in the canopy)

Coniferous Woodland – an area of woodland with predominantly coniferous tree species (less than 10% deciduous trees in the canopy)

Hibernacula – structures that are used by reptiles to hibernate through the winter, such as log piles, rock piles, vegetation piles, old mammal burrows and tree root complexes.

Improved Grassland – grasslands that have been so modified by fertilizers, drainage or grazing that they have lost most of the species expected in unimproved grassland. They contain a very limited number of grasses and a few common forbs.

Plantation Woodland – woodland of any age that obviously originated from planting

Refuge – any structure that provides reptiles with a place they can retreat to and feel secure. This can be rock or log piles, dense scrub or mammal burrows

Riparian – area of land that is immediately adjacent to a water body.

Ruderal – a plant that colonizes waste ground. They are often weeds that have a high nutrient requirement and/or are intolerant of competition.

Scrub – climax vegetation dominated by locally native shrubs, usually less than 5m tall.

Semi-improved Grassland – grassland that has been modified by fertilizers, drainage or intensive grazing. Contain less species diversity than unimproved grasslands.