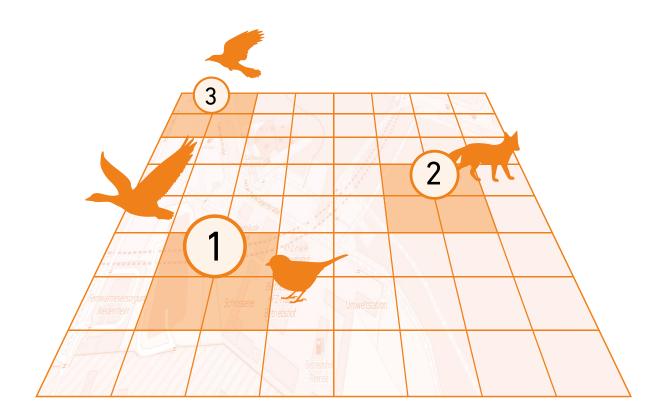
Handbook | eControl mobile

Wildlife Control Point-stop method

eControl mobile 1.0



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eControl

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The eControl mobile data capture system has a special functionality which enables the results of field animal surveys to be recorded rapidly, conveniently and reliably. With the aid of the Point-stop method the software product detects animal species to be found at an airport and in external habitats and the frequency with which they are found, as well as the distribution patterns in terms of area and time.

The statistical tools of the Bird Control software module and ad-hoc observations, bird strikes and bodies found can be used to prepare scientifically proven statistical analyses which enable authentic expert reports on habitats to be drawn up and allow a targeted measuring and minimising of wildlife risks.



1.1 The Point-stop method

With minimum staffing requirements, the Point-stop method generates relative population indices on a measured section selected for monitoring purposes which can be used to establish population development trends and also to assess the effectiveness of habitat management.

eControl mobile may be used online and offline and is also suitable for use in external habitats where mobile telecommunication is not possible. The eControl mobile data capture system can reduce substantially the costs of a Point-stop inspection, which is in any case resource-efficient in comparison with other counting systems, since it dispenses with the digitisation and archiving of handwritten count lists.

The software product was designed specifically for mobile use and has a simple and reliable interface which meets the challenging requirements of field inspections.

No special knowledge is required to operate the software, including the data transfer component.

eControl mobile can be integrated seamlessly into the system. If required or necessary, a combined operation can be performed involving tally lists on paper and their subsequent transfer into the system and the simultaneous use described in this white paper of one or more mobile entry systems.

1.2 Scientific background

The Bird Control software module's dialogue management and screen design are based on the software solution which has been used at various airports since 2000 and was developed at the instigation of the DAVVL / GBSC (German Bird Strike Committee) airport ecology working group.



The provision of the e-Control mobile data capture system means that current technical options such as touch-sensitive surfaces, radio networks, GPS data, etc. can be used to optimise the costly process of data capture.

The "Point-stop method" counting system implemented by eControl mobile embedded in a habitat and inspection system, meets the requirements of the DAVVL whose objective is to create a scientifically proven process for minimising the bird strike rate and generally minimising the risk posed to aviation by wildlife.

2 Wildlife Control in the EASA Regulations

In future, wildlife control will be part of EASA certification to which all airports with more than 10,000 passenger movements and more than 850 cargo movements are subject.

The essential references are set out below:

- Basic Regulation (EU) No. 1108/2009 of 21. October 2009
 - B.1.c); C.2.e)
- Cover Regulation (EU) No. 139/2014 of 12. February 2014
 - Article 9.e)
 - Article 10 (1) a), b) und c)
 - Article 10 (2)
- ADR.OPS.B.020 Wildlife strike hazard reduction
- AMC1 ADR.AR.C.010 Oversight programme
 - (b) (15)
- GM1 ADR. OR.D.015(d) Personnel requirements - (c) (5)
- AMC1 ADR.OR.D.030 Safety reporting system
 - (b) (1) und (2)
- AMC3 ADR.OR.E.005 Aerodrome manual
 - (17)
- AMC1 ADR.OPS.B.015 Monitoring and Inspection of movement area and related facilities
 - General (b)
 - Pavements an adjacent ground service inspection (b) (7)
- GM5 ADR.OPS.B.015 Monitoring and inspection of movement area and related facilities
- AMC1 ADR.OPS.B.020 Wildlife strike hazard reduction
- GM1 ADR.OPS.B.020 Wildlife strike hazard reduction
- GM2 ADR.OPS.B.020 Wildlife strike hazard reduction
- GM3 ADR.OPS.B.020 Wildlife strike hazard reduction
- GM4 ADR.OPS.B.020 Wildlife strike hazard reduction

Wildlife-Monitoring - Step by Step

3.1 Step 1: Establishing habitats and sections to be monitored

In general, wildlife monitoring should cover the airports themselves and the areas adjoining the manoeuvring area, as well as the external habitats which influence the presence of animals - in particular birds - according to expert biological knowledge.

The "GM2 ADR.OPS.B.020 Wildlife strike hazard reduction" document provides an indication of the extent to which adjoining areas need to be covered:

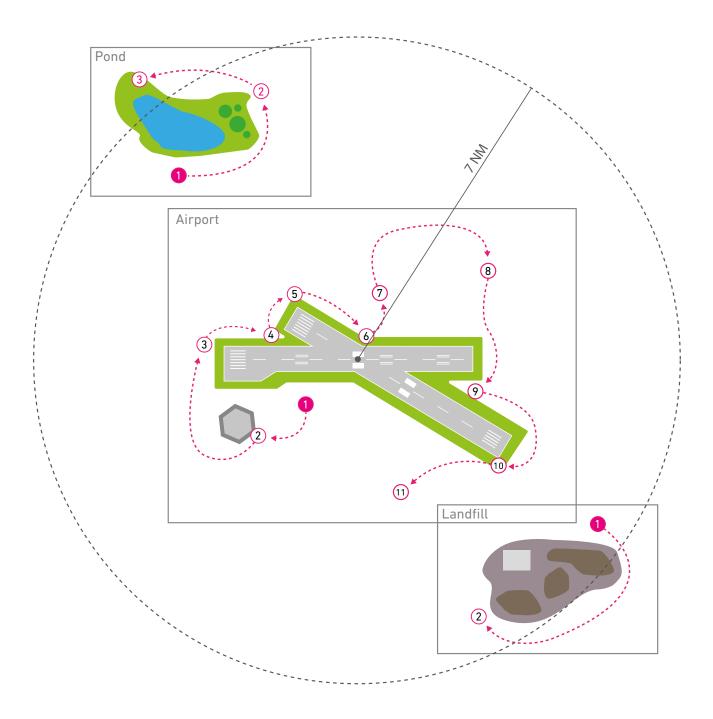
GM2 ADR.OPS.B.020 Wildlife strike hazard reduction The wildlife risk management programme may cover an area of approximately 13 km (7 NM) from the aerodrome reference point, [...]

Wildlife monitoring here concentrates on expanses of water, landfill sites, food production sites, etc.

The size and the selection of those sections to be subject to wildlife monitoring has an impact on the informative value of statistical analyses and should be based on ornithological expertise and validated at appropriate intervals.

By way of example, the observation points should be set up at least 200 m from each other to avoid double counting. All birds on the ground and over-flying birds and other relevant animal species can be counted for a period of roughly the same time at these observation points.

The map on the following page shows the habitats dealt with in this white paper



3.2 Step 2: Creating maps of habitats in eControl

3.2.1 Concept

Creating maps of habitats in eControl means that eControl mobile can be used for the automatic identification and verification of measuring points.

A measuring point is identified in a wholly automatic process through a comparison of the Geo Locator's GPS coordinates with the map's master data.

To this end, the map's master data must display WGS 84 position data. The WGS 84 (World Geodetic System 1984) standard was superseded in 1989 by the ICAO 1989 for aviation.

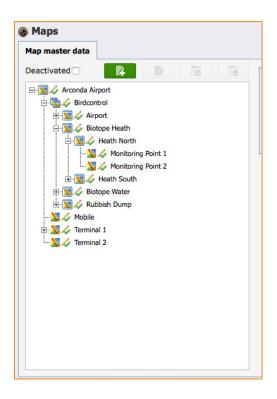
The map's master data are managed using the eControl master data dialogue

"Settings / Master data / General / Maps..."

and requires administrative rights:

"Settings / Master data / Other / Map master data"

The situation used as an example involves a sub-division of the area being monitored into three habitat levels "external habitat at a landfill site", "external habitat on an expanse of water" and the actual airport area of "Arconda Airport". The measuring points then have to be set up for each habitat using measured sub-maps.



3.2.2 Maintenance dialogue

Commercial airports usually have up-to-date and appropriate map material for the airport area and the manoeuvring area. Maps covering external habitats may be obtained easily by using freely available geodata such as "Open Street Map", for example.

The orientation of the maps does not need to be set for north - the section of the map concerned can be based on the relevant habitat components.

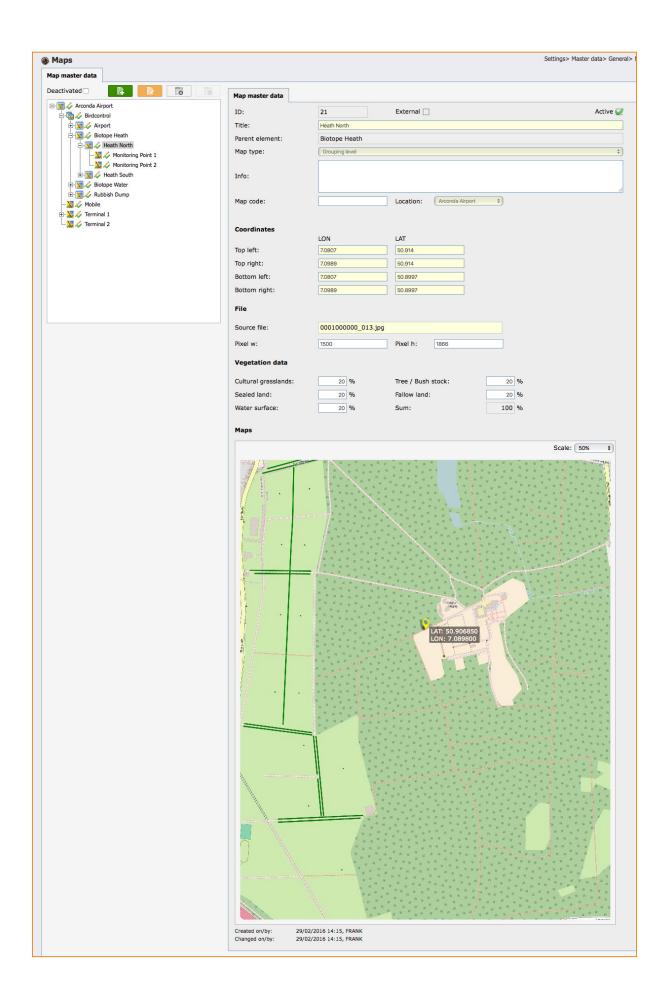
Map objects can be represented in all the image formats displayable in a web browser:

- JPEG
- GIF
- PNG
- BMP

Site-specific measurements can be made easily using what is known as a differential GPS which determines the location within a one-metre range and is therefore sufficiently precise for such use.

The angles of the rectangular map section should be measured:





3.3 Step 3: User set-up

For data to be captured using eControl mobile the authorisation of the observer must be shown on the tab head "Module licensing" in the "User master data" dialogue.

100000138 • Consultant Joness, Richard • r.joness@m2p.com • CJORI	User ma	ster data						
Jule Licenses avaible Assignment	Master data	User rights	Data access rights	Start menu	Presetting	User group	Template	Module licensing
	ID 000001	38 • Consulta	nt Joness, Richard	 r.joness@m 	2p.com • CJ	IORI		
ile Client UCAL 1335 / 1337	Module				Lice	nses avaible	Assignme	nt
	Mobile Client	UCAL			13	335 / 1337	6	7

To ensure the source of all information can be traced, the observers working in the field must be enabled personally in the above mentioned dialogue. The user enabled in the above mentioned dialogue and registered in the eControl mobile data capture system for a Point-stop inspection is known professionally as an "observer".

Therefore, data from point-stop observations may only be recorded using eControl mobile if the user has the user right:

"eControl WEB-Client / BirdControl / Administration / BirdControl administration"

This ensures that data are collected by professionally qualified and authorised observers.

In addition to the guarantee that data logged are tamper-proof, the clear identification of the observer is used as a universal selection criterion for the statistics produced by the Bird Control module. This way, observation variances can be identified irrespective of ornithological and biological knowledge and implementation practices.

Statistic frequency distribution	n of birds		Reports> BirdControl> Statistics> Statistic frequency distribution of bird
election criterias Report view			و ې
General selection criteria Observer Ed	cological criteria		
All locations			
Arconda Airport			
Airbus, Aribert	ANONYMUS, ANONYMUS	✓ Boeing, Bodo	
Consultant Joness, Richard	 Consultant Woodstock, Peter 	JAVVL, DAVVL	
Espenhain, Frank	✓ Hope, Bob	✓ Lee, Tim	
Maschke, Markus	President, Phil	Rohmann, Pascal	
SAP, BATCH01	Smith, Barbara	SMSADMIN, SMSADMIN	
TQMS, TQMSNOTIFIER			

3.4 Step 4: Inspection of Measuring Points used in the Monitoring Process

3.4.1 Preparation

There is no need for any preparatory work prior to using eControl mobile. Any changes made to the map material, species, etc. before the observation are loaded into the terminal device on a fully automatic basis. That fully automatic matching of data takes place as soon as the mobile terminal device is in the area covered by the intranet.

If that matching procedure can take place only at long intervals for technical reasons related to the network - e.g. the commissioning of external ornithologists - eControl mobile will guarantee that all the data collected can be processed in full and is tamper-proof.

In principle, the operation and data transfer component of eControl mobile is unaffected by the number of eControl mobile systems used altogether or at the same time.

3.4.2 Inspections

The observations at the measuring points used in the monitoring process of the section of a habitat under observation take place in the logical sequence of an inspection. For mathematical and statistical reasons, all measuring points used in the monitoring process must be taken into account in the course of an inspection so as to avoid impairing the informative value of the data collected.

Using eControl mobile, the documentation of an inspection can be interrupted at any measuring point and resumed later at any measuring point (see Section "3.4.4.12 Temporary storage"). The inspection sequence is not important.

Owing to the influencing factor of the "observer" the restriction of use, namely that the inspection must always be resumed by the same user or the user previously logged in, should be noted.

eControl mobile therefore guarantees that inspections can be continued seamlessly whenever operational requirements of a higher priority so require. The final issuing of the inspection number takes place when the data are uploaded.

Numerous statistics produced by the Bird Control module, which can be used to prove the frequency of and number of staff used for wildlife inspections, are based on the issuing of inspection numbers.

3.4.3 New Point-stop inspection

A Point-stop inspection should be started individually for each measuring section to be monitored and inspected.

If, for example, a bird controller conducts observations for three different habitats or measuring sections to be monitored during an observation trip, a new point-stop observation procedure should be initiated for each section monitored.

For a new inspection, the user initially presses the



button and then opens the event form entitled "Animal observations - Point-stop" using the



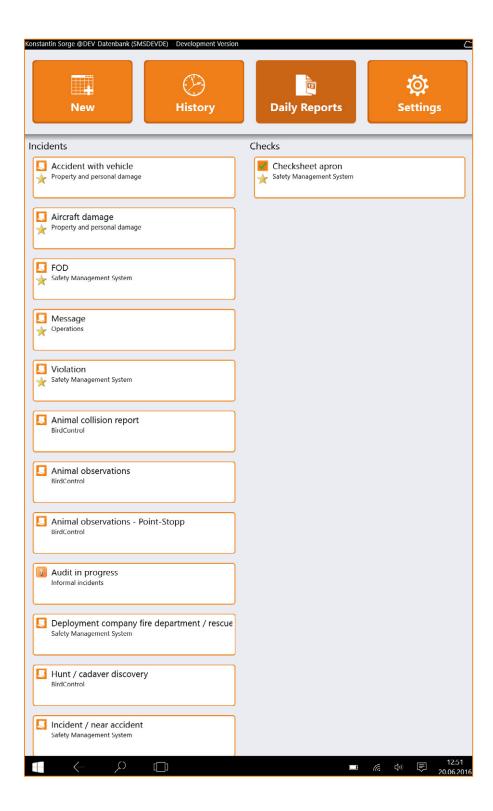
...button.

Following the temporary storage of the first observation, only other measuring points of that section being monitored may be selected.

The "Animal Observations - Point-stop" form may be used to record data using eControl mobile only if the user has the

"eControl WEB-Client / BirdControl / Administration / BirdControl administration"

right.



3.4.4 As many measuring points as you like

3.4.4.1 Tally Sheet

The procedure for data entry is identical for each measuring point. The entry dialogue has been designed to simulate a tally list.

With eControl mobile over 1,000 different species can be recorded in the database. From the perspective of wildlife management, by contrast, only 10-20 species, depending on the airport concerned, are of particular importance for habitat management.

Those species are counted manually, not using eControl mobile, and the count and subsequent entry in the eControl module are speeded up with animal codes with which ornithologists and bird controllers are familiar for the most important species.



3.4.4.2 The data collection form at a glance

	BirdControl	oservations - Point-Stopp ^{rt} toring Point 1	01:56	
	Title: Bir	d Control Observation		C
	Monitoring Po	int: Monitoring Point 1		~
d →	Inspection nur	mber: 86760		
е	Type/No	Birds	✓ Finches	~
		bullfinch		/ 391 f
g →	Amount	7	-10 -1	+10 +1
h →	Note:			
	Species informa	ition		

- a. eForm category title
- b. Map and current measuring point
 (s. Absatz "3.4.4.6 Automatic identification of measuring points and manual changes")
- c. Title
- d. Inspection number (s. Absatz "3.4.4.5 Inspection number")
- e. Species classification

 (s. Absatz "3.4.4.8 Species and frequencies of occurrence")
- **f.** Animal code (s. Absatz "3.4.4.8 Species and frequencies of occurrence")
- **g.** Quantity (s. Absatz "3.4.4.8 Species and frequencies of occurrence")
- h. Note field (s. Absatz "Hinweise zur Beobachtung")

- i. Adding species (s. Absatz "3.4.4.10 Add or remove species")
- j. Buffer data entry and resume later (s. Absatz ",3.4.4.12 Temporary storage")
- k. Cancel (s. Absatz "3.4.4.13 Cancelling")
- Complete and save for upload (s. Absatz "3.4.4.14 Completing the Point-stop inspection")
- m. Save and transit to next measuring point (s. Absatz "3.4.4.15 Transition to the next measuring point")
- n. Observation period (s. Absatz "3.4.4.3 Observation period")

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3.4.4.3 Observation period

The observation period data field (the value 01:56 is given in the example) documents the time spent at a measuring point used in the monitoring process. For the correct data to be displayed the observation must not be carried out at different times or interrupted.

3.4.4.4 Inspection period

The inspection period indicated in the "Reports->BirdControl->Reports->Inspections..." report is established on the basis of the start times of the individual observations.

Gesamtbeobachtungsdauer = t (Anfang letzter Messpunkt) - t (Anfang erster Messpunkt)

3.4.4.5 Inspection number

The provisional inspection number documented in "3.4.2 Inspections" is inserted below the event heading.

Inspection number: 86760

3.4.4.6 Automatic identification of measuring points and manual changes

1. Automatic identification of measuring points:

The fully automatic identification of measuring points speeds up the data entry process, improves ease of operation and enhances the quality of the data through the avoidance of data-entry errors.

The system independently identifies the habitat and the measuring point:



eControl mobile can also be used to record data for another measuring point of the identified habitat if the user wishes to add the data at a later stage of the inspection.

If required, the position information can also be set manually by clicking the



...button.

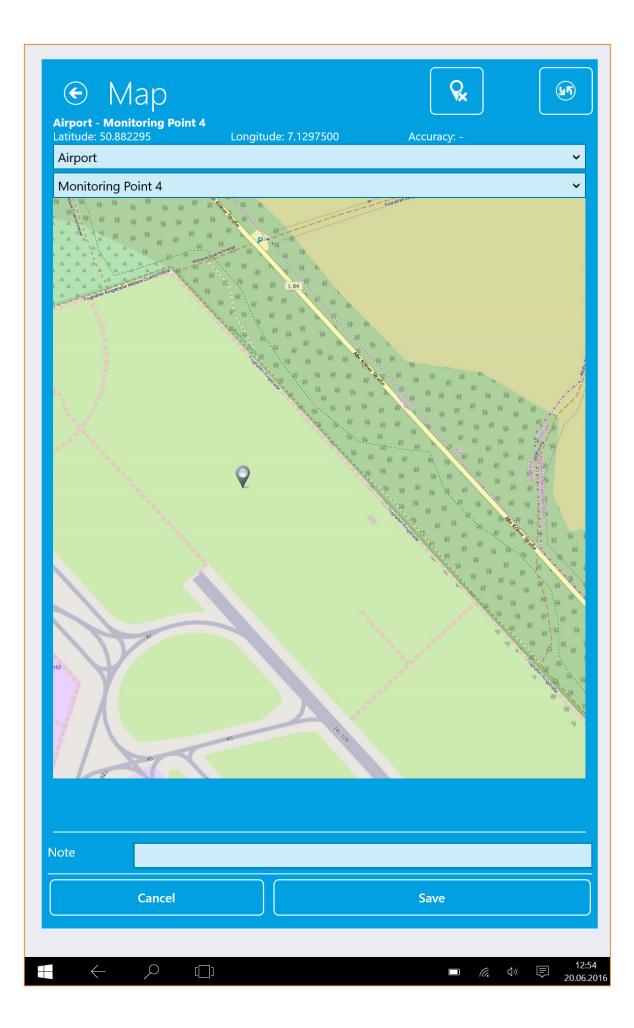
A map for the habitat identified by the system is shown below. The pin visualises the GPS position or the present location of the observer which can be changed manually by pressing and holding the measuring point required.

The user may select points only within the areas earmarked for measuring points. The position is changed by clicking the following button:



A user can usually return to the current position at any time by pressing the following button:





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2. Changing a map manually:

The map dialogue has a dropdown list for the habitats created by the system.

After a habitat has been selected, the associated measuring points can be selected from the dropdown list.

It is not possible to process measuring points which the system has assigned to different measuring sections during a Point-stop inspection. Once an observation for a measuring point, which has been assigned clearly to a measuring section, has been saved temporarily, only measuring points from that measuring section may be selected.

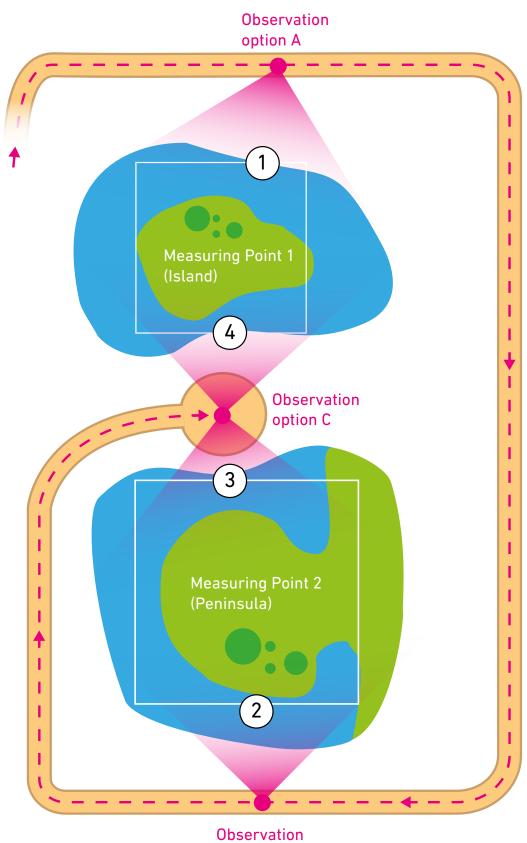
In general, the user has the option of overriding the measuring point suggested by the system on the basis of the GPS position by making a selection from the dropdown list.

There is also the option of setting the position pin manually by touching the map, causing the system to identify the measuring point concerned based on the coordinates.

This is an important function in particular in the case of habitats to which access is difficult or which cannot be inspected. An example of such a situation is where a measuring point used in the monitoring process is located within a security zone which the bird controller is not allowed to enter. If appropriate, counts will have to be carried out at a few successive measuring points used in the monitoring process from different perspectives so as to be able to understand the area under observation in full. In such cases, depending on the topology, the mobile system may be unable to identify the measuring point concerned based on the GPS coordinates.

In the example outlined below the bird controller is travelling along observation options A, B and C in order to monitor the "island" and "peninsula" measuring points. Both measuring points cover an area which the bird controller does not enter and each comprises two partial observations and perspectives.

The occurrence of animals for the "island" measuring point is counted during observations 1 and 4, whereas the animal occurrence for the "peninsula" measuring point is counted during observations 2 and 3.



option B

3.4.4.7 Verifying the measuring points

Measuring points can be incorrectly assigned inadvertently if the observer goes to the next measuring point and omits to initiate data entry for a new measuring point by pressing the following button (see Section "3.4.4.15 Transition to the next measuring point"):



If a user in that situation adds a new species (+) or changes the quantity under obser-

vation by using the buttons (-10 -1 +10 +1)*), the system will ask whether a new measuring point should be opened:

Your current position has changed and does			
not correspond with the last monitoring point. Do you want to add a new monitoring point?	Yes	No	

If the user gives the answer "yes" to that question, a new monitoring point will be created automatically.

3.4.4.8 Species and frequencies of occurrence

The selection of the species under observation and the entry or supplementation of the animals under observation must take place during the conducting of observations at a measuring point.

The "Point-stop Wildlife Observation" form offers many functions which help the observer to concentrate on the task he is actually to perform.

ADREP ECCAIRS-compatibility

The species which can be selected in eControl mobile or the Bird Control module are compatible with the ICAO's ADREP taxonomy. This means a clear attribution can be made pursuant to values range VL1041_12_0_1_2 / Reduced Interface Taxonomy (RIT).

Selection of species using the animal code

As a means of reducing the time spent on animal species entry, it is common practice to select species using the animal code.

The Bird Control module is supplied as standard with numerical animal codes pursuant to the DAVVL (German Bird Strike Committee) standard. The customer can customise those animal codes at any time. After a known animal code is recorded, the data fields

- Type of animal <-> Species
- Animal group and
- Animal category

are filled automatically.

Type/No	Birds	 Pigeons, cuckoos
	stock pigeon (8.333%)	✓ / 263
Amount	7	-10 -1 +10
Note:		

Selection of species using the full-text search option

Besides selecting animals using animal codes, the species can also be selected by executing a full-text search of the designation of species.

The species data field can be used to enter a search term.

In the example set out below, a search is executed for all species which contain the string "Pigeons, cuckoos":

Animal c BirdControl	bservations - Point-Stopp	01	:52	
Title: B	ird Control observation - Point-Stopp			
Inspection nu	ımber: 18159			
Туре/No	Birds	~	Pigeons, cuckoos	~
	stock pigeon (8.333%)			/ 263
Amount	wood pigeon (1.667%)			0 +1
Note:	cuckoo			
Species inform	domestic pigeon			
	eurasian collared dove			
	European Turtle Dove			- +
	pigeons, cuckoo -not spec			

Selection of species using the classification system

Another built-in inspection for selecting a species involves making a step-by-step determination using the classification system

- 1. Animal category
- 2. Animal group
- 3. Type of animal <-> Species

Once the user has set a limit, starting with animal category, only the animal groups belonging to the selected category will be displayed and so on.

Amount

The quantity of animals under surveillance can be entered immediately in the following data field.

Amount	7	-10 -1 +10 +1



The buttons can be used conveniently to expand or change the quantity of animals quickly in one to ten steps without the screen keyboard having to be displayed.

Image and master data documentation of the selected species

Pressing the -button will reveal the information stored in the system in relation to this species:

	ol observations - Point-Stopp 07:00
Title:	Bird Control observation - Point-Stopp
Inspection	number: 89617
Type/No	Birds
	stock pigeon (8.333%) / 263
Amount	7 -10 -1 +10 +1
Note:	
Species info	ormation 🔽
	Columba genus in the Columbidae family. It is a member of the family Columbidae, doves and pigeons.

3.4.4.9 Information on an observation

Explanatory text amounting to a maximum of 4,000 characters may be entered for each species so as to record relevant attendant circumstances or other comments on the species under observation.

That information can be found readily either by executing a targeted search or a full-text search.

Amount		
Note:		
Constantinformer	<i>tion</i>	

3.4.4.10 Add or remove species

Any quantity of counted species may be added at each measuring point and, in the event of an incorrect entry, removed. This process is controlled using the following buttons:



If a species which has already been logged appears again during an observation period and increases the quantity, the quantity of animals counted may be increased accordingly.

If a species is added several times at a measuring point, the system will allow that entry and ensure that the correct total quantity is passed on to the Bird Control module's database.

3.4.4.11 Measuring points where no observations take place

It is conceivable that no species due to be counted will be observed at a measuring point during the observation period. In such a case, the correct statistical calculation of average frequencies of occurrence can also be carried out by the Bird Control module unless all measuring points show that observations have taken place.

If explicit evidence of observation activity is required, that can be produced by entering 0 in the quantity for

Animal category <> not specified Animal group <> not specified Type of animal <> not specified

The statistics in the Bird Control module can filter these data to avoid any unintended false data.



By pressing the



...button the Point-stop inspection is saved temporarily in the mobile system and can be reworked comprehensively and supplemented later on.



Pressing the



..button will cancel the Point-stop inspection.

Having confirmed the

Cancel processing?	Yes	No

entries which have not been saved temporarily (see Section "3.4.4.12 Temporary storage") will be deleted from the system.

3.4.4.14 Completing the Point-stop inspection

The inspection is concluded as soon as the last measuring point of the section being monitored has been processed.

Pressing the



..button completes the mobile processing irrevocably provided the answer "Yes" is given to the under-mentioned confirmation prompt.



All data from the inspection logged previously will be uploaded immediately via the radio network to the eControl server and processed.

The storage capacity of modern mobile Windows systems means a very large quantity of data may be saved temporarily directly on the mobile device. It should be noted that mobile Windows systems are often not backed up systematically, which means the possibility of data which have not been transferred being lost in the event of a system malfunction or system loss cannot be ruled out.

Long-term buffering of observation data will restrict wildlife monitoring unnecessarily and impede the management of measures.

3.4.4.15 Transition to the next measuring point

After the observation period has ended at one measuring point, the inspection is continued at the next measuring point if the observer has not yet fully processed the section to be monitored.

Clicking the following button will cause the entries for the current measuring point to be saved temporarily and bring about a transition to the entry dialogue for the next measuring point.





3.4.5 Edit measuring point

There is no limit on the time within which the observations saved in the "Point Count Wildlife observation" form as temporarily saved data can be processed.

As soon as an individual measuring point of an inspection has been saved permanently and therefore earmarked for data transfer to the Bird Control module, the processing of all measuring points of that inspection is ended.

		NEW		Espenhain, Frank	Demo-DB EN (SMSDEMOEN
uffered					
Г	Date	Time	Event	Title	Status Delete
5	20/06/16	13:01	Animal observations - Point-Stopp	Bird Control observation - Point-Stopp (Airport - Monitoring Point 4)	
3	20/06/16	13:02	Animal observations - Point-Stopp	Bird Control observation - Point-Stopp (Airport - Monitoring Point 2)	
ch	nive Date	Time	Event	Title	Status
-		Time 12:52	Event Animal observa Point-Stopp Begehung: 8676	tions - Bird Control Observation (Airport - Monitoring	

All measuring points of temporarily saved inspections are listed in the "temporarily stored" area in descending order, sorted by inspection.

By selecting a measuring point the user moves to the processing dialogue.

3.5 Step 5: Data transfer

In principle, data transfer takes place in a fully automatic process as soon as the mobile device is "online" or located in an area covered by a network, a WLAN or - depending on the system environment selected - a mobile phone network.



The network connection status can be seen in the system's status bar. eControl transfers only forms whose status is shown as "permanently saved". (see Section ",3.4.4.14 Completing the Point-stop inspection")

In the data transfer process the forms are converted from the "Point Count Wildlife Observation" type into the standard observations of the Bird Control module. The conversion does not impair the tamper-proof nature of the data or their statistical informative value. The data logged using eControl mobile differ only as regards the processing status of wildlife observations, which were recorded manually using the web GUI.

3.6 Step 6: New Inspection

In the data transfer process the forms are converted from the "Point Count Wildlife Observation" type into the standard observations of the Bird Control module. The conversion does not impair the tamper-proof nature of the data or their statistical informative value. The data logged using eControl mobile differ only as regards the processing status of wildlife observations, which were recorded manually using the web GUI.

As soon as the data have been transferred, the eControl notifier's notification rules are verified automatically in accordance with the eControl system standard - for example, the safety manager could be notified when there are swarms of 100 or more animals.

3.7 Step 7: Review and Statistical Analysis

Observations recorded using mobile devices are reviewed and statistical analyses prepared for them in the same way as for observations recorded using the web GUI.

Read access and permission to process forms depends on the observer or owner of the data and the data access rights of the person wishing to access them.

In principle, image documentation, measures, risk classifications, etc. can be added for each observation. If such is required for individual observations of an inspection, it must take place after the data transfer in the web GUI.

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