The First Desert Locust Joint Survey in the Winter Breeding Areas in Djibouti and Somalia

February 2004





FAO EMPRES/CR Commission for Controlling the Desert Locust in the Central Region



The First Desert Locust Joint Survey in the Winter Breeding Areas in Djibouti and Somalia

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By

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The First Desert Locust Joint Survey in the Winter Breeding Areas in Djibouti and Somalia 14 – 18 February 2004

1. Summary

An area of around 1963 Ha has been surveyed during the joint survey from 14 to 18 February 2004 between Djibouti & Somaliland of which 1783 ha were in Djibouti & 180 ha were in Somaliland. The distance travelled during the survey was 776kms (46 km Djibouti, 730 Somaliland). The Somaliland team travelled an extra 580km corresponding the distance from & to Hargeisa & Djibouti. The situation was calm in general, though some isolated solitary adult locusts were seen in following sites:

N°	Name	Coordinates	N° DL	Habitat	Comments
1	Shirdon	N 11 03 33 E 043 27 22	1	Wadi, Aerva gevenica & Panicum dominated with some Balanites raximosa	At the beginning of the large Geriyad plain. Good habitat for DL breeding. Whole Geriyad should be monitored during the coming surveys.
2	Faragorgorley	N 10 44 23 E 043 33 10	3	Plain dominated by <i>Helitropium</i> and <i>Aerva gevenica</i> . Soil is sandy and favourable for DL breeding	Possibility in increasing numbers. Need to be surveyed within 3 weeks. Grazing area for camels
3	Ban awl	N 10 35 19 E 043 56 57	3	Plain, dominated by grasses with <i>Balanites raximosa</i> & <i>Accacia</i>	The locusts may concentrate in the green areas if there is no rains during the coming weeks.
4	Eel Sheikh	N 10 25 22 E 044 14 01	2	Plain, dominated by Panicum with Accacia & Balanites raximosa & egytiaca	Good habitat for breeding. Some developments is expected. To be visited within 3 weeks.
5	Bullahar	N 10 23 03 E 044 24 06	1	Sand dunes, <i>Accacia</i> with <i>Panicum & Sueda fruticosa</i>	Need to be monitored during the coming weeks. To be included the regular surveys from Hargeisa.
6	Bararis	N 10 26 29 E 044 10 54	2	Wadi, Panicum & Purithinica	Upper parts of the wadi need to be surveyed during the coming period.
7	Abdi Guide	N10 31 30 E44 02 45	1	Sand soil suitable for breeding one locust seen	To be surveyed in the regular surveys by Somali team.

In general the area surveyed was green except east of Geeri to Berbera, which is not suitable for DL breeding due to salty soil and the type of vegetation. Regarding the ground truthing of the satellite images received from the FAO DLIS headquarter. The team observed that most areas

matched on the image as green area is confirmed during the survey. The clouds were observed during mornings and afternoons.

2. Introduction

The present joint survey was initiated during the recent visit of the EMPRES coordinator to Somaliland & Djibouti on mid of the last year after discovering the potential habitat for locust breeding in those areas. The joint border surveys between EMPRS member countries was given the attention by EMPRES & CRC to encourage these countries to conduct surveys at borders as a potential areas for desert locust breeding.

Due to the importance of the coastal area of Djibouti to Somaliland EMPRES& CRC in a good collaboration with two Governments agreed to conduct the first joint surveys at area between Loyadda & Berbera. The findings will assess the two countries to undertake the arrangements for facilitating the teams to cross borders easily during survey operations.

The arrangements of both countries were relay nice and there were no obstacles. The visa & the security clearance were done on time within a short notice. Both the border authorities were very collaborative and even facilitated and welcomed the collaboration & cooperation between the two countries. In terms of awareness at the high officials there was a positive reaction and were supportive to the overall concept.

Joint team agreed to carry out similar surveys during applicable seasons at regular basis. This is for the interest of the two parts and of course will reduce the possible infestation at central region.

3. <u>Survey Methodology</u>

The joint team implemented during the survey to both two methods of surveying as follows:

- Foot transects: Each survey officer has walked about 150 200 meter in each stop at the survey site with the wind to his face. Locust adults are been counted in a width of 1.5m 2m strip in front of each officer. The total number of locusts counted and the length and width of the foot transect are been recorded on the survey form. Furthermore, the officers have noted the presence or absence of locusts and their appearance, behavior, and maturity as well as the ecology at the survey site. If several officers conduct transects at the same location, the total number of locusts seen in the total length of transect should be recorded on the survey form (including those officers who did not see any locusts in their transect), assuming that the transect width is the same for each officer.
- Vehicle transects: A vehicle transect was made for at least one kilometer while driving slowly in low gear with the wind from behind. The officers counted the number of adults that fly up across the front of the vehicle.

4. <u>Survey findings</u>

The team recognised that coastal areas of Djibouti & Somaliland can be divided into 4 main habitats:

- 1. A sandy plain named GERIYAD, which starts from AishaAdda & extend to Gerisa downwards to the seacoast to Lughaya. Panincum & other grasses, which are favourable for Desert Locust, dominate it. The *Acacia* & *Balanites* trees as well as Aervia *javanica* are also disbursed in the area..
- 2. The triangle area between Gerisa, Lughayo & Bullahar has a same type of vegetation & more wadis is spread over that area. The vegetation is dominated by *Aervia javanica* together with *Panicum* & other grasses at a low density. While the *Acacia* trees are

more in number than the Geriyad plain. This area falls under a protected depressions by mountain ranges, so less windy and serve desert locust to settle down & possibly breed. Most of the locust reported was found at this site.

- 3. Dunes, dominated by acacia with some panicum grasses, characterize the area in between Bullahar & Geeri. The Desert locust habitat within this area is distributed in small patches.
- 4. The area between Geeri & Berbera is classified as non-desert locust habitat. It is dominated by *Sueda fruticosa*. This is due to high level of salty sandy soils. This area has less importance to Dl activities.

Detailed results of the survey are attached on the survey forms annexe 6.4.

An on job training was carried during the survey operation for both two teams which comprises mainly on the following:

- Use of GPS
- Proper recording in the FAO survey & control forms.
- Information collection during the survey.
- Identification of DL & its different phases.
- Transmission of DL information through HF radios.
- Organisation of joint survey.
- How to make ground truthing.
- Familiarisation of filed camping.

5. <u>Recommendation</u>

The joint team recommends:

- The duration of the survey should be increased one day when area between Geeri and Berbera is under joint survey.
- Due to lack of electricity, there is a need of battery power lamps for the team to conduct night discussions & to avoid the wild animals to approach the camping site.
- Some protective facilities are needed like blankets specially to protect the individuals/team from possible rains or cold.
- The team should be at the beginning be autonomous in terms of food & water supply to increase the area to be surveyed.
- Advance arrangements are needed to avoid any delay in starting.
- It is recommended that both vehicles are equipped with radios.
- One palmtop computer (PSION) needs to be available for the Somalia to send survey results of the JS and regular survey as eLocust files.

6. Acknowledgement

The joint team would like to forward their satisfaction to the two Governments particularly the border authorities for their efforts in facilitating the border movements. They as well would like at this occasion to thank the EMPRES sraff & particularly the technical guidance of Mr Fuad Bahakim NPO/EMPRES during the preparation, implementation & reporting of the present joint survey. Finally the team recognise the financial assistance from FAO/ EMPRES & CRC.

7. Annexes

Radio operator

PPD officer

7.1. List of participants

Djibouti Team

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Somaliland team

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FAO/ EMPRES/CRC

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 NPO-survey

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 Fax: 967 1 250980
 Email : empre-fao-ye@y.net.ye

7.2. <u>Itinerary</u>

Date	Starting	End
14/02/04	Djibouti	Gerisa
15/02/04	Gerisa	Geeri
16/02/04	Geri – Berbera	Bullahar
17/02/04	Bullahar	Loyadda.
18/02/04	Loyadda	Djibouti

7.3. Photo images

1. Joint team discussing findings



- 3. Geriyad plains with clouds at afternoon
 - - 5. Eeel Shaikh (N10 25 22 E44 14 01)

2. Ashyada (N111030 E432622) part of Geriyad plains



4. Faragorgorley (N10 44 23 - 43 33 81) with dense green vegetation



6. On -job -Training on how to use the GPS





7.4. <u>Survey forms</u>

Please send to FAO HQ by fax (+39-06-57055271) or e-mail (eclo@fao.org)
appropriate information as required)

(page 1 of 4) (indicate

appropri	ate information as required)					_	
1	SURVEY STOP	1	2	3	4	5	6
1-1	Date	14/02/04	14/02/04	14/02/04	14/02/04	14/02/04	15/02/04
1-2	Name	Barislev	waraboodka	shirdongarni	Dhuur	Girivev	Hubev
1-3	Latitude (N)	11 25 10	11 13 30	11 03 33	10 51 55	10 49 50	10 40 33
1-4	Longitude (E or W)	43 18 34	43 18 54	43 27 22	43 25 50	43 25 43	43 28 50
2	FCOLOCY	15 10 51	15 10 5 1	15 21 22	15 25 50	15 25 15	15 20 50
2 1		90 h -	90 h -	05 h -	100 h -	105 h -	05 h a
2-1	Area (na) or survey	80 na	80 na	95 na	100 na	125 na	95 nq
2-2	Habitat (wadi, plains, dunes, crops)	wadi	wadi	Plains	Wadi	Plains	Wadi
2-3	Date of last rain	15/01/04	15/01/04	18/01/04	1/02/04	1/02/04	1/02//04
2-4	Rain amount (mm, low moderate					М	М
	high?)	L	М	М	М		
				-	-	-	
2-5	Vegetation (dry, greening, green,	green	dray	Green	Green	Green	Green
	drying)						
2-6	Vegetation density (low medium						
	dense)	L	L	М	М	М	М
2-7	Soil moisture (wet/dry)	D	D	D	D	W	W
3	LOCUSTS		D	D	D	••	
31	Dresent on absent			•		D	Δ
3-1	r resent or absent	А	А	A	A	r	А
3-2	Area infested (ha)						
4	HOPPERS						
4-1	Hopper stages (H123456F)	H123456F	H123456F	H123456F	H123456F	H123456F	H123456F
4-2	Appearance (Solitary transience	STG	STG	STG	STG	STG	STG
	areagrious)	510	510	510		510	510
12	Behavior (isolated southered	ISC	LSC	LSC	LSC	I.S.C	LSC
4-3	benavior (isolated, scattered,	130	130	130	130	130	130
	groups)						
4-4	Hopper density (/site, /m2, low med						
	high)						
5	BANDS						
5-1	Band state (H12345F)	H12345F	H12345F	H12345F	H12345F	H12345F	H12345F
5-2	Band density (/m2 or low medium						
52	high)						
5.2	Dand sizes (/m2 or he)						
5-5	Band sizes (/m2 or ma)						
5-4	Numbers of bands						
6	ADULTS						
6-1	Maturity (immature, mature)	ΙM	I M	I M	I M	М	ΙM
6-2	Appearance (solitary, transience,	STG	STG	STG	STG	S	STG
	gregarious)						
6-3	Behavior (isolated, scattered,	ISG	ISG	ISG	ISG	Ι	ISG
	groups)					1	
6-4	Adult density (/transect /ha I M					-	
	H)						
6.5	Breading (consulating laying)	CI	CI	C I	СТ	СТ	СТ
0-5	GWA DAG				C L	C L	υL
1	SWARMS						
7-1	Maturity (immature, mature)	I M	I M	I M	I M	I M	I M
7-2	Swarm density (/m2 or low						
	medium high)						
7-3	Swarm size (km2 or ha)						
7-4	Number of swarms						
8-5	Breeding (copulating, laving)	СL	CL	CL	CL	CL	СL
7-6	Flying (direction, time passing)						
7-7	Flying height (low medium high)	ГМН	ГМН	ГМН	ГМН	ГМН	ТМН
8	CONTROL						1. 11 11
0 1							
8-1	resucide name and formulation						
8-2	Application rate (l/ha or g/ha)						
8-3	Quantity (1)						
8-4	Area treated (ha)						
8-5	Ground or air	G A	G A	G A	G A	G A	G A
8-6	Estimated % kill						
9	COMMENTS						
-	C CHARTER I I D	Sand soil	Sand soil	Sand soil	Sand soil	Sand soil	Sand soil
			ponioi-	nonicity tree	paniaium terre i	Sanu Son	balanitame
		Acacia	paniciu,	paniciu, tree	panicium tree 1s	witti	balante;prosop
		Iree	tree 1s	is dominant	awaible	panicim	is tree is
		Is awaible	awaible			tree; only	awaible
1			1	1	1	one locust	

Was a GPS used to determine locations? Yes

Country : Somaliland

Locust officer Joint Survey Team

Please send to FAO HQ by fax (+39-06-57055271) or e-mail (<u>eclo@fao.org</u>) appropriate information as required)

1	SURVEY STOP	1	2.	3	4	5	6
1-1	Date	15/02/04	15/02/04	15/02/04	15/02/04	15/02/04	15/02/04
1-2	Name	Karuure	Fargorley	bevohliban	Beenhawil	Habooyada	Eeel sheik
		11414410	1 ungoiney	eeyonnoun	Deennavin	Indoooyudu	Leen shem
1-3	Latitude (N)	10 44 38	10 44 23	11 03 33	10 35 19	10 23 10	10 25 22
1-4	Longitude (E or W)	43 33 16	43 33 81	43 27 22	43 56 59	44 08 03	44 14 01
2	ECOLOGY						
2-1	Area (ha) of survey	100 ha	115 ha	95 ha	80 ha	118 hq	95 hq
2-2	Habitat (wadi, plains, dunes, crops)	Plains	Plains	Plains	Plains	Dunes	Plain
2-3	Date of last rain	25/02/04	25/01/04	25/01/04	16/01/04	15/01/04	1/02//04
2-4	kain amount (mm, low moderate	м	т	м	м	M	M
	liigii?)	IVI	L	101	111		
				<i>a</i>	9	6	9
2-5	Vegetation (dry, greening, green,	green	Green	Green	Green	Green	Green
26	drying) Vegetation density (low medium						
2-0	dense)	м	м	м	D	м	М
2-7	Soil moisture (wet/dry)	W	D	D	D	W	W
3	LOCUSTS			_			
3-1	Present or absent	A	Р	A	A	Α	Р
3-2	Area infested (ha)		-				
4	HOPPERS						
4-1	Hopper stages (H123456F)	H123456F	H123456F	H123456F	H123456F	H123456F	H123456F
4-2	Appearance (Solitary, transience,	STG	STG	STG	STG	STG	STG
	gregarious)						
4-3	Behavior (isolated, scattered,	ISG	ISG	ISG	ISG	ISG	ISG
	groups)						
4-4	Hopper density (/site, /m2, low med						
-	high)						
5	BANDS Band state (U12245E)	1112245E	1110245E	1110245E	1110245E	1110245E	1110245E
5-1 5-2	Band state (H12345F) Band density (/m2 or low medium	H12345F	H12345F	H12343F	H12545F	H12345F	H12545F
5-2	high)						
5-3	Band sizes (/m2 or ha)						
5-4	Numbers of bands						
6	ADULTS						
6-1	Maturity (immature, mature)	ΙM	М	ΙM	I M	М	Ι
6-2	Appearance (solitary, transience,	STG	Т	STG	STG	S	S
	gregarious)		_				
6-3	Behavior (isolated, scattered,	ISG	I	ISG	ISG	I	S
6.4	groups)		3/2/200			1	2/2/150
0-4	H)						
6-5	Breeding (copulating laying)	СL	СL	СL	C L	CL	СL
7	SWARMS	01		0 1	0.2	0 1	0 1
7-1	Maturity (immature, mature)	I M	ΙM	I M	I M	ΙM	I M
7-2	Swarm density (/m2 or low						
	medium high)						
7-3	Swarm size (km2 or ha)						
7-4	Number of swarms		<u> </u>		a •		<u> </u>
8-5	Breeding (copulating, laying)	CL	CL	CL	CL	CL	СL
/-0 7 7	Flying (direction, time passing)	тмп	тмп	тмц	тмч	тмп	тмп
8	CONTROL			СМП			
8-1	Pesticide name and formulation						
8-2	Application rate (l/ha or g/ha)						
8-3	Quantity (1)						
8-4	Area treated (ha)						
8-5	Ground or air	G A	G A	G A	G A	G A	G A
8-6	Estimated % kill						
9	COMMENTS						
		Sand soil	Sand soil	Sand soil	Sand soil	Prosopis	Sand soil
		baaread	2 mature	paniciu, tree	panicium with	tree is	paniciu, is tree
		I ree	locust	is the most	panicium	abandand	1s awaible
		is awaible		awalble			∠ locust
						l	miniature

Was a GPS used to determine locations? Yes

Country : Somaliland

Locust officer Joint Survey Team

Date : 18/02/04

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		SURVEY STOP	1	2	3	4	5	6
	1-1	Date	16/02/04	16/02/04	16/02/04	17/02/04	17/02/04	15/02/04
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$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	1.2		10 21 02	10.21.50	10.22.12	10.26.20	10 21 20	10.26.29
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$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	1-4	FCOLOGY	++ 37 20	44 51 57	44 25 52	44 10 55	44 02 45	43 30 43
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	2-1	Area (ha) of survey	80 ha	120 ha	60 ha	100 ha	120 ha	100 ha
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	2-2	Habitat (wadi, plains, dunes, crops)	Wadi	Wadi	dunes	Wadi	Plzin	Plain
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	2-3	Date of last rain	15/01/04	6/01/04	6/01/04	23/01/04	23/01/04	2301//04
$ \begin{array}{ c c c c c c } & high? \\ \hline high? \\ \hline high? \\ \hline high? \\ \hline c \\ \hline vegetation (dry, greening, green, drying) \\ \hline c \\ c \\$	2-4	Rain amount (mm, low moderate					М	L
2-5Vegetation (dry, greening, green, drying).greenGreenGreenGreenGreenGreenGreendruingGreen2-6Vegetation density (low medium dense)LLLLLMM2-7Soil moisture (wet/dry)DDDDWDD3LOCUSTSHDWDDD3-1Present or absentAAPPPP3-2Area infested (ha)H123456FH123456FH123456FH123456FH123456FH123456F4-4Hopper stages (H123456F)HH123456FS T GS T GS T GS T GS T G4-3Behavior (isolated, scattered, high)I S GI S G5-1Band density (m2 or low medium high)H12345FH12345FH12345FH12345FH12345FH12345FH12345F5-2Band density (m2 or low medium high)H12345FH12345FH12345FH12345FH12345FH12345F6-1Auturity (immature, mature)I MMMIMII6-2Appearance (solitary, transience, grogarious)S T GIS T GSS6-3Behavior (isolated, scattered, 		high?)	L	L	L	М		
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2-0Vegetation density (now including dense)LLLLLMM2-7Soil moisture (wet/dry)DDDDWDDD3-1Present or absentAAPPPP3-2Area infested (ha)AAPPPP4HOPPERSH123456FH123456FH123456FH123456FH123456FH123456FH123456F4.3Behavior (isolated, scattered, groups)S T GS T GS T GS T GS T GS T GS T G4.4Hopper density (/site, /m2, low med high)I S GI S GI S GI S GI S GI S GI S G5.1Band state (H12345F)H12345FH12345FH12345FH12345FH12345FH12345FH12345F5.1Band state (H12345F)H12345FH12345FH12345FH12345FH12345FH12345F5.3Band state (H12345F)H12345FH12345FH12345FH12345FH12345FH12345F6ADULTSIIMIMIII6-1Maturity (immature, mature)I MMIIIII6-3Behavior (isolated, scattered, gregarious)S T GS T GSSSS6-3Behavior (isolated, scattered, gregarious)I S GI MIIIII6-4Aduut density (transect, /ha, L M <b< td=""><td>26</td><td>drying) Vegetation density (low medium</td><td></td><td></td><td></td><td></td><td></td><td></td></b<>	26	drying) Vegetation density (low medium						
2-7Soil moisture (wet/dry)DDDDDWDD3LOCUSTSIAAPPPP3-1Present or absentAAPPPP3-2Area infested (ha)AAPPPP4HOPPEXSH123456FH123456FH123456FH123456FH123456FH123456F4-3Behavior (isolated, scattered, groups)I S GI S GI S GI S GI S GI S GI S G4-4Hopper density (/site, /m2, low med high)H12345FH12345FH12345FH12345FH12345F5-1Band state (H12345F)H12345FH12345FH12345FH12345FH12345F5-2Band density (/m2 or low medium high)H12345FH12345FH12345FH12345FH12345F5-3Bad sizes (m2 or ha)S T GTSSSS5-4Numbers of bandsIMIMII6-1Maturity (immature, mature)I S GIIIII6-3Behavior (isolated, scattered, groups)I S GI S GIIIII6-3Breading (copulating, laying)C LC LC LC LC LC LO7-1Maturity (immature, mature)I MI MI MI MI MI MI MI M7-2Swarm density (/m2 or low medium high)C	2-0	dense)	L	L	L	L	М	М
3 LOCUSTS A A P P P P 3-1 Present or absent A A P P P P P 4 HOPPERS H123456F H12345F H123456F H12345F	2-7	Soil moisture (wet/dry)	D	D	D	W	D	D
3-1Present or absentAAPPPP3-2Area infested (ha)IIPPP4HOPPERSIII23456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123456FH123457FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345F <td>5</td> <td>LOCUSTS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	5	LOCUSTS						
3-2 Area infested (ha) Image: constraint of the state of the	-1	Present or absent	Α	Α	Р	Р	Р	Р
4 HOPPERS H123456F H123456F H123456F H123456F H123456F H123456F S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T G S T	-2	Area infested (ha)						
4-2Appearance (Solitary, transience, gregarious)FI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450FFI125450F<	1	HOPPERS	U10245CE	H10245CE	U102456E	H122456E	U102456E	H122456E
4-2 Appearance (solitar), transience, is 1 °C 5 °C 1 °C 1 °C 5 °C 1 °C 1 °C 5 °C 1 °C <td< td=""><td>-1</td><td>Appearance (Solitary transience</td><td>H123450F</td><td>H123430F</td><td>H123430F</td><td>H125450F</td><td>H123450F</td><td>H123450F</td></td<>	-1	Appearance (Solitary transience	H123450F	H123430F	H123430F	H125450F	H123450F	H123450F
4-3 Behavior (isolated, scattered, groups) I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G I S G S G I S G S G I	2	gregarious)	510	510	510	510	510	510
4.4 Hopper density (/site, /m2, low med high) Image: state of the state of	-3	Behavior (isolated, scattered,	ISG	ISG	ISG	ISG	ISG	ISG
4-4 Hopper density (/site, /m2, low med high) Image: site of the second se		groups)						
Ingn) Image: Constraint of the second se	-4	Hopper density (/site, /m2, low med						
5BANDSH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345FH12345		high)						
5-2 Band density (/m2 or low medium high) III23431 III23431 <td< td=""><td>1</td><td>BANDS Band state (H12345E)</td><td>H12345E</td><td>H12345E</td><td>H12345E</td><td>H12345E</td><td>H12345E</td><td>H12345E</td></td<>	1	BANDS Band state (H12345E)	H12345E	H12345E	H12345E	H12345E	H12345E	H12345E
bigh 5-3 Band sizes (/m2 or ha)	-1	Band density (/m2 or low medium	11123451	11123431	11123431	11123431	11123431	11123431
5-3 Band sizes (/m2 or ha)	-	high)						
5-4 Numbers of bands Image: constraint of bands Image: constraint of bands 6 ADULTS Image: constraint of bands Image: constraint of bands Image: constraint of bands 6-1 Maturity (immature, mature) Image: constraint of bands Image: constraint of bands Image: constraint of bands 6-2 Appearance (solitary, transience, gregarious) Image: constraint of bands Image: constraint of bands Image: constraint of bands 6-3 Behavior (isolated, scattered, Image: constraint of bands) Image: constraint of bands Image: constraint of bands Image: constraint of bands 6-4 Adult density (/transect, /ha, L M H) Image: constraint of bands Image: constraint of bands Image: constraint of bands Image: constraint of bands 6-5 Breeding (copulating, laying) C L C L C L C L C L C L 7-1 Maturity (immature, mature) I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M	-3	Band sizes (/m2 or ha)						
6 ADULTS I M I M I M I 6-1 Maturity (immature, mature) I M M I M I 6-2 Appearance (solitary, transience, gregarious) S T S S S S 6-3 Behavior (isolated, scattered, groups) I S G I I I I I 6-4 Adult density (/transect, /ha, L M 3/2/200 3/2/200 1/2/200 3/2 6-5 Breeding (copulating, laying) C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L	-4	Numbers of bands						
6-1 Maturity (immature, mature) I M M I M I 6-2 Appearance (solitary, transience, gregarious) S T G T S S S 6-3 Behavior (isolated, scattered, groups) I S G I I I I I 6-4 Adult density (/transect, /ha, L M 3/2/200 3/2/200 1/2/200 3/2 6-5 Breeding (copulating, laying) C L C L C L C L C L C L C L 7-1 Maturity (immature, mature) I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M		ADULTS			, T	N		
6-2 Appearance (solidary, transletice, gregarious) 5 T O 1 1 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T 5 T <t< td=""><td>-1</td><td>Appearance (solitery, transience)</td><td></td><td>M</td><td>l s</td><td>M</td><td>I S</td><td>l s</td></t<>	-1	Appearance (solitery, transience)		M	l s	M	I S	l s
6-3 Behavior (isolated, scattered, groups) I S G I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I	-2	gregarious)	510	1	5	5	5	5
6-4Adult density (/transect, /ha, L M H)3/2/2001/2/2003/26-5Breeding (copulating, laying)C LC LC LC LC LC L7SWARMS	-3	Behavior (isolated, scattered,	ISG	Ι	Ι	Ι	Ι	Ι
6-4 Adult density (/transect, /ha, L M H) 6-5 Breeding (copulating, laying) C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C		groups)		3/2/200			1/2/200	3/2/200m
H) C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C	-4	Adult density (/transect, /ha, L M						
7 SWARMS C C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L C L L L <th< td=""><td>5</td><td>H) Broading (convlating laving)</td><td>СТ</td><td>СТ</td><td>СТ</td><td>C I</td><td>СТ</td><td>СТ</td></th<>	5	H) Broading (convlating laving)	СТ	СТ	СТ	C I	СТ	СТ
7-1 Maturity (immature, mature) I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M I M	-5	SWARMS	C L	C L	CL	C L	СL	C L
7-2 Swarm density (/m2 or low medium high) 7-3 Swarm size (km2 or ha) 7-4 Number of swarms 8-5 Breeding (copulating, laying) 7-6 Flying (direction, time passing)	'-1	Maturity (immature, mature)	I M	L M	I M	I M	ΙM	ΙM
medium high) medium high) 7-3 Swarm size (km2 or ha) 7-4 Number of swarms 8-5 Breeding (copulating, laying) 7-6 Flying (direction, time passing)	-2	Swarm density (/m2 or low						
7-3 Swarm size (km2 or ha) 7-4 Number of swarms 8-5 Breeding (copulating, laying) 7-6 Flying (direction, time passing)		medium high)						
7-4 Number of swarms 8-5 Breeding (copulating, laying) 7-6 Flying (direction, time passing)	-3	Swarm size (km2 or ha)						
7-6 Flying (direction, time passing)	-4	Number of swarms Breeding (copulating laying)	CI	C I	СТ	CI	C I	CI
	-6	Flying (direction, time passing)	ιL					СL
/// Flying height (low medium high) LMH LMH LMH LMH LMH LMH LMH L	-7	Flying height (low medium high)	LМН	LМН	LМН	LМН	LМН	LМН
8 CONTROL	6	CONTROL						
8-1 Pesticide name and formulation	-1	Pesticide name and formulation						
8-2 Application rate (l/ha or g/ha)	-2	Application rate (l/ha or g/ha)						
0-5 Quantity (1) 8-4 Area treated (ba)	-3	Qualitity (1) Area treated (ba)						
8-5 Ground or air GAGAGAGAGAGAGA	-5	Ground or air	GΑ	GΑ	GΑ	G A	GΑ	GΑ
8-6 Estimated % kill	-6	Estimated % kill						
9 COMMENTS)	COMMENTS						
			Sand soil	Sand soil	Sand soil	Sand soil 2	Sand soil	Expecting to be
Sand soil Sand soil Sand soil 2 Sand soil Expec			acacia tree	Mixed with	swada tree;	mature locust	suitable for	multiple if rain
Sand soil Sand soil Sand soil Sand soil 2 Sand soil Expect acacia tree Mixed with swada tree; mature locust suitable for multi			is dominat	moroh	one locust		breeding	rall down
Sand soil Sand soil Sand soil Sand soil Sand soil Expective acacia tree Mixed with swada tree; mature locust suitable for multij is dominat moroh one locust breeding fal					seen at night		one locust	

Was a GPS used to determine locations? Yes

Locust officer Joint Survey Team

Country : Somaliland & Djibouti

Date : 18/02/04

1	SURVEY STOP	1	2	3	4	5	6
1-1	Date	17/02/04	18/02/04	18/02/04			v
1-2	Name	odowaderi	loyadda	Bahur			
1.2		11.06.12	11.00.04	11.00.00			
1-3	Latitude (N)	11 06 42	11 28 24	11 29 38			
2	ECOLOGY	45 50 52	045 15 20	045 12 54			
2-1	Area (ha) of survey		100ha	80			
2-2	Habitat (wadi, plains, dunes, crops)		plian	dunes			
2-3	Date of last rain	1/02/04	4wks	4wks			
2-4	Rain amount (mm, low moderate	_	L				
	high?)	L		L			
2-5	Vegetation (dry, greening, green,	D	grrn	drying			
26	drying) Vacatation density (law madium		т				
2-0	dense)	L	L	L			
2-7	Soil moisture (wet/dry)	D	D	D			
3	LOCUSTS						
3-1	Present or absent	А	А	Α			
3-2	Area infested (ha)						
4	HOPPERS						
4-1	Hopper stages (H123456F)	H123456F					
4-2	Appearance (Solitary, transience,	STG					
4-3	Behavior (isolated, scattered	ISG					
. 5	groups)	1 5 5					
4-4	Hopper density (/site, /m2, low med						
	high)						
5	BANDS	11100155					
5-1	Band state (H12345F)	H12345F					
5-2	Band density (/m2 or low medium						
5.2	high)						
5-5 5-4	Numbers of hands						
6	ADULTS						
6-1	Maturity (immature, mature)	ΙM					
6-2	Appearance (solitary, transience,	STG					
	gregarious)						
6-3	Behavior (isolated, scattered,	ISG					
6-4	Adult density (/transect_/ha_L_M						
÷ .	H)						
6-5	Breeding (copulating, laying)	C L					
7	SWARMS						
7-1	Maturity (immature, mature)	I M					
1-2	medium high)						
7-3	Swarm size (km2 or ha)						
7-4	Number of swarms						
8-5	Breeding (copulating, laying)	C L					
7-6	Flying (direction, time passing)	1 14 11					
/-/	CONTROL	LMH					
8-1	Pesticide name and formulation						
8-2	Application rate (l/ha or g/ha)						
8-3	Quantity (1)						
8-4	Area treated (ha)						
8-5 8-6	Ground or air	GA					
0-0 9							
,	COMMENTS	Sand soil	Sand soils	Dunes			
		with	Accacia	dominated			
		panicuim	&Cassia	prospice &			
		trees sweda	Itlauica	cassia italica			

Was a GPS used to determine locations? Yes

Locust officer Joint Survey Team

Country : Somaliland Date : 18/02/04