

Table 3.2.1: Details of cyclonic storms along North Gujarat coast (1893-1999).

Year	Month	Intensity	Point of Origin	Track followed
1893	Nov	Str-SStr	Arabian Sea	Veraval-Bhavnagar
1894	Oct	SStr	Arabian Sea	Jafarabad-S.Gujarat
1896	Nov	SStr	Indian Ocean	Off Jafarabad-Bhopal-Allahabad
1897	Jul	Depr	Arabian Sea	Off Jafarabad-Veraval-Gulf of Kachchh
1897	Sep	Depr	Off Diu	Veraval-Off Dwaraka-NW
1903	Jul	Str	Arabian Sea	Off Jafarabad-Veraval-North
1909	Sep	Depr	Bay of Bengal	Surat-Jafarabad-Kandla-NW
1920	Jun	SStr	Arabian Sea	Veraval-Ahmedabad
1925	Jun	Depr	Arabian Sea	Off Veraval-Kandla-Bhopal-Allahabad
1925	Jun	Depr	Arabian Sea	Bharuch-Bhavnagar-Okha
1926	Sep	Depr	Off Veraval	Veraval-N-W-N
1933	May	Depr	Arabian Sea	Veraval-N
1934	Oct	Depr	Arabian Sea	Dissipated Off Jafarabad
1935	Jun	Depr	Bay of Bengal	Gulf of Khambhat
1944	Aug	Str	Bihar	Ahmedabad-Kandla-Off Jafarabad-W
1944	Oct	Depr	Bay of Bengal	Pune-Mumbai-Off Jafarabad-Ahmedabad
1947	Apr	SStr	Off Cochin	Arabian Sea-Bharuch-along the West coast
1948	Sep	SStr	Bay of Bengal	Mumbai-Off Diu-Porbandar
1954	Jul	Depr	Off Jafarabad	Vadinar-Karachi
1959	Oct	Depr-Str	Arabian Sea	Jafarabad-Veraval-across the Arabian Sea-Oman
1960	Jul	Depr	Off Veraval	Off Dwarka-Mandwa
1962	Sep	Depr	Bay of Bengal	Surat-Jafarabad-Dwarka-Mandwa

Table 3.2.1 (Contd.2)

Year	Month	Intensity	Point of Origin	Track followed
1964	Aug	Str	Arabian Sea	Jafarabad
1969	Jun	Depr	Arabian Sea	Jafarabad-Bhavnagar
1973	Jul	Depr	Off Diu	Veraval-Porbandar-Vadinar-N
1975	Jun	Depr	Off Jafarabad	Okha-W
1976	May-Jun	SStr	Arabian Sea	Jafarabad-Ahmedabad
1982	Nov	Depr	Arabian Sea	Veraval-Ahmedabad-NE
1983	Jun	Depr	Off Veraval	Veraval-Rajkot
1985	Oct	Depr	Off Mumbai	Jafarabad-W of Bhavnagar Jafarabad-Surat-NE
1989	Jun	Depr	Off Veraval	Junagadh-Rajkot-Navlakhi-Vadinar-NW
1996	Jun	SStr	Kandla	Kandla-Rajkot
1996	Oct	SStr	Arabian Sea	Kandla-Veraval-Jafarabad
1998	June	SStr	Arabian Sea	Porbandar-Jamnagar-Kandla
1999	June	SStr	Arabian Sea	Porbandar-Dwarka-Jakhau

Intensity (Wind speed)

Depression (Depr) : Upto 61 km/h.

Storm (Str) : 62-87 km/h.

Severe Storm (SStr) : 89-117 km/h.

Table 3.3.1 (Contd 2)

Parameter	Level	Okha				Salaya		Vadinar		Sikka		
		Feb 1993	Mar 1995	Apr 2002	July 2004	Feb 1995	Apr 2002	Mar 1994	Mar 1996	Apr 1994	Apr 2002	Apr 2003
P _{Total} (μmol/l)	S	-	-	-	-	-	-	0.8-3.2 (2.0)	-	-	-	-
	B	-	-	-	-	-	-	1.4-3.2 (2.3)	-	-	-	-
NO ₃ ⁻ -N (μmol/l)	S	1.2-4.4 (2.8)	6.9-7.9 (7.4)	4.2-10.7 (7.4)	13.0*	1.1-3.6 (2.3)	0.7-6.0 (3.3)	0.1-1.4 (0.6)	1.4-8.4 (4.3)	4.0-7.6 (5.3)	0.1-4.3 (2.2)	0.3-1.3 (0.8)
	B	1.4-4.1 (2.8)	5.4-6.1 (5.8)	3.3-6.8 (5.0)	11.8*	1.1-4.1 (2.6)	1.1-5.4 (3.2)	0.1-1.4 (0.9)	2.4-7.8 (4.1)	4.0-6.3 (5.1)	0.1-2.3 (1.2)	1.2-1.5 (1.4)
NO ₂ ⁻ -N (μmol/l)	S	0.1-0.4 (0.3)	0.5-0.6 (0.5)	0.2-0.7 (0.4)	0.8*	0.1-0.6 (0.4)	0.1-0.5 (0.3)	0.1-0.3 (0.2)	ND-0.4 (0.3)	0.2-0.5 (0.3)	0.1-0.2 (0.1)	0.2-0.2 (0.2)
	B	0.2-0.4 (0.3)	0.2-0.4 (0.3)	0.2-0.9 (0.5)	0.9*	0.1-0.6 (0.4)	0.2-0.4 (0.3)	0.1-0.6 (0.3)	ND-0.4 (0.3)	0.1-0.5 (0.3)	0.1-0.2 (0.1)	0.2-0.2 (0.2)
NH ₄ ⁺ -N (μmol/l)	S	ND-2.9 (1.5)	0.1-0.4 (0.3)	0.1-0.2 (0.1)	2.4*	ND-10.5 (5.2)	0.1-0.1 (0.1)	0.5-0.9 (0.7)	0.1-0.9 (0.5)	0.1-1.2 (0.4)	0.1-0.2 (0.1)	0.9-2.0 (1.5)
	B	ND-2.0 (1.0)	ND-0.2 (0.1)	0.1-0.1 (0.1)	2.2*	ND-5.0 (2.5)	0.1-0.1 (0.1)	0.5-0.9 (0.7)	ND-2.9 (1.2)	0.1-0.6 (0.4)	0.1-0.1 (0.1)	ND-ND (ND)
N _{Total} (μmol/l)	S	-	-	-	-	-	-	13.4-26.6 (20.0)	-	-	-	-
	B	-	-	-	-	-	-	13.8-15.9 (14.9)	-	-	-	-
PHc (μmol/l)	1m	-	13.3*	1.0-5.7 (3.3)	54.2*	-	0.8-2.3 (1.5)	3.9-5.7 (4.8)	3-12 (7)	8-18 (10)	2.0-2.0 (2.0)	0.4-0.7 (0.6)
Phenols (μmol/l)	S	-	-	134-190 (163)	89*	-	68-132 (100)	9-20 (15)	31-48 (39)	5-13 (9)	61-168 (114)	24.5-32.6 (28.6)

Table 3.3.1: Water quality of the Gulf during premonsoon (1993-2004).

Parameter	Level	Okha			Salaya		Vadinar		Sikka			
		Feb 1993	Mar 1995	Apr 2002	July 2004	Feb 1995	April 2002	Mar 1994	Mar 1996	Apr 1994	Apr 2002	Apr 2003
Temp (°C)	S	25.5-26.5 (26.0)	25.3-25.5 (25.4)	24.9-27.5 (26.2)	31.0*	24.0-26.0 (25.0)	25.0-27.5 (26.2)	26.0-28.5 (27.0)	25.0-29.2 (27.1)	25.4-27.8 (26.8)	24.4-27.6 (26.0)	28.0-28.7 (28.4)
	B	25.8-26.5 (26.1)	24.9-25.0 (25.0)	24.9-27.5 (26.2)	30.4*	23.0-25.0 (24.0)	25.9-26.34 (26.3)	26.0-27.5 (27.0)	24.6-29.3 (26.8)	25.3-27.8 (26.6)	24.0-27.5 (25.8)	26.9-27.0 (27.0)
pH	S	8.0-8.3 (8.2)	8.0*	8.0-8.2 (8.1)	8.1*	7.9-8.2 (8.1)	8.2-8.4 (8.3)	7.8-8.0 (7.9)	8.0-8.3 (8.0)	8.0-8.1 (8.0)	8.0-8.4 (8.2)	8.1-8.1 (8.1)
	B	8.2-8.3 (8.3)	8.0*	8.2-8.2 (8.2)	8.1*	8.0-8.3 (8.2)	8.3-8.4 (8.3)	7.8-8.0 (8.0)	8.0-8.3 (8.2)	8.0-8.1 (8.1)	8.2-8.4 (8.3)	8.2-8.2 (8.2)
SS (mg/l)	S	27-31 (29)	17*	16-29 (23)	78	19-38 (28)	15-33 (24)	18-35 (22)	9-17 (13)	18-29 (23)	14-17 (16)	18-22 (20)
	B	31*	16*	16-35 (26)	84	21-46 (33)	16-56 (36)	22-26 (24)	8-20 (13)	19-32 (21)	16-50 (33)	6-18 (12)
Salinity (ppt)	S	37.2-38.5 (37.9)	36.2*	37.5-38 (37.7)	35.7*	36.1-37.5 (36.8)	37.6-38.4 (38.0)	37.4-38.6 (37.9)	36.6-37.4 (37.0)	37.1-37.7 (37.3)	36.9-38.5 (37.7)	39.2-39.4 (39.3)
	B	36.8-38.5 (37.7)	36.8*	37.5-38.0 (37.7)	35.6*	36.2-37.5 (36.8)	37.9-38.4 (38.1)	37.3-38.3 (37.9)	36.4-37.8 (37.2)	36.9-37.5 (37.2)	37.4-38.5 (37.9)	39.4-39.4 (39.4)
DO (ml/l)	S	2.9-3.6 (3.3)	4.0-4.3 (4.1)	2.2-5.2 (2.3)	4.1*	4.3-5.4 (4.8)	1.8-5.6 (3.7)	3.4-5.3 (4.6)	3.8-5.3 (4.6)	3.2-4.8 (4.4)	1.8-5.6 (3.7)	4.6-4.8 (4.7)
	B	2.9-3.3 (3.1)	4.6 (4.6)	2.5-5.8 (4.1)	4.4*	2.9-5.0 (3.9)	1.8-5.6 (3.7)	3.8-4.9 (4.4)	4.0-5.5 (4.7)	3.4-4.8 (4.3)	1.6-5.4 (3.5)	4.6-4.8 (4.7)
BOD (mg/l)	S	1.4-3.7 (2.5)	1.5*	0.2-3.5 (1.8)	3.8*	1.1-4.3 (2.7)	1.0-4.3 (2.6)	1.7-3.3 (2.5)	1.0-1.7 (1.4)	2.7-3.8 (3.2)	1.0-4.1 (2.5)	-
	B	0.2*	-	0.3-4.2 (2.2)	3.0*	0.3-0.6 (0.5)	<0.2-1.9 (1.0)	0.2-0.7 (0.5)	0.3-1.3 (0.8)	2.0-2.1 (2.1)	<0.2-3.4 (1.8)	0.6-0.9 (0.8)
PO ₄ ³⁻ -P (µmol/l)	S	0.3-1.7 (1.0)	0.6-0.9 (0.7)	0.3-1.6 (0.9)	0.4*	0.7-1.4 (1.1)	0.4-1.1 (0.7)	ND-2.9 (0.5)	1.0-2.8 (1.7)	0.2-4.1 (0.8)	0.6-0.8 (0.7)	0.2-0.4 (0.3)
	B	-	0.5-2.2 (1.3)	0.6-1.4 (1.0)	0.6*	0.7-1.4 (1.1)	0.9-1.3 (1.1)	0.3-3.1 (0.8)	1.4-2.8 (2.1)	0.6-1.1 (0.7)	0.3-1.2 (0.7)	1.0-1.0 (1.0)

Table 3.3.1 (Contd 3)

Parameter	Level	Bedi	Navlakhi			Kandla		Mundra			
		Mar-1997	Mar-1996	Apr-2002	Feb-1998	Apr-2002	Mar-1997	Feb-1999	Mar-2000	Apr-2002	June-2003
Temp (°C)	S	21.5-24.5 (23.0)	25.9-26.5 (26.0)	27.8-30.5 (28.7)	22.5-24.0 (23.1)	27.0-29.0 (27.9)	22.9-24.0 (23.6)	23.3-28.5 (24.7)	22.0-25.5 (24.1)	25.3-27.5 (26.9)	28.4-29.8 (29.3)
	B	22.0-23.9 (23.0)	25.0-25.9 (25.5)	26.0-29.5 (28.5)	22.5-25.5 (23.4)	26.5-29.0 (27.7)	22.8-23.5 (23.1)	23.2-25.8 (24.2)	22.0-25.5 (23.6)	24.0-29.8 (27.0)	28.7-29.7 (29.2)
pH	S	8.1-8.3 (8.2)	8.1-8.2 (8.2)	8.0-8.3 (8.2)	7.8-8.0 (8.0)	8.0-8.2 (8.1)	8.1-8.2 (8.2)	7.7-8.2 (8.2)	8.1-8.3 (8.3)	8.2-8.2 (8.2)	7.9-8.0 (8.0)
	B	8.0-8.3 (8.2)	8.1-8.2 (8.2)	8.1-8.3 (8.2)	7.9-8.0 (8.0)	8.0-8.2 (8.1)	8.1-8.2 (8.2)	8.1-8.2 (8.2)	8.2-8.3 (8.3)	8.1-8.2 (8.2)	8.0-8.0 (8.0)
SS (mg/l)	S	21-45 (27)	30-41 (36)	75-275 (149)	105-214 (149)	80-366 (162)	25-33 (30)	22-32 (25)	20-72 (32)	16-25 (24)	178-190 (184)
	B	18-45 (28)	47-204 (126)	80-385 (214)	101-272 (184)	115-410 (217)	19-98 (53)	30-54 (40)	24-118 (61)	17-35 (27)	260-440 (350)
Salinity (ppt)	S	37.5-38.6 (38.1)	39.3-40.1 (39.7)	41.0-44.4 (42.7)	37.5-38.0 (37.8)	38.4-39.9 (39.4)	35.8-38.6 (37.6)	35.9-38.1 (37.3)	37.4-38.3 (37.9)	37.6-38.2 (38.0)	37.7-38.6 (38.4)
	B	37.3-38.6 (38.7)	38.5-40.1 (39.3)	41.5-45.0 (43.3)	37.4-37.9 (37.6)	38.4-40.2 (39.4)	36.1-38.5 (37.9)	36.0-38.2 (37.5)	37.6-39.0 (38.0)	37.5-38.3 (38.0)	37.7-38.6 (38.3)
DO (ml/l)	S	4.2-5.3 (4.6)	2.9-5.0 (3.9)	1.8-4.5 (3.1)	2.5-5.0 (4.0)	1.6-5.2 (3.6)	4.1-5.3 (4.9)	1.8-5.7 (3.9)	1.7-5.1 (3.6)	2.5-6.0 (3.9)	1.5-4.6 (3.8)
	B	4.3-5.0 (4.5)	4.3-5.0 (4.6)	2.0-4.7 (3.5)	2.5-4.8 (3.9)	1.8-4.9 (3.7)	3.7-5.1 (4.9)	1.8-5.7 (4.3)	1.7-5.3 (4.0)	4.0-5.9 (4.2)	1.9-4.4 (3.8)
BOD (mg/l)	S	1.0-3.1 (1.9)	<0.1-1.8 (0.9)	0.3-1.2 (0.7)	-	0.2-4.4 (2.7)	0.9-1.9 (1.3)	<0.1-4.4 (2.3)	0.8-3.4 (1.8)	0.6-3.4 (2.9)	2.1-2.7 (2.4)
	B	0.3-2.3 (1.6)	0.2-1.2 (0.7)	0.3-3.5 (2.0)	-	0.4-3.5 (2.2)	<0.1-1.8 (0.8)	<0.1-3.8 (1.8)	0.9-3.1 (1.2)	0.1-5.1 (4.9)	1.5-1.8 (1.7)
PO ₄ ³⁻ -P (µmol/l)	S	1.0-2.7 (1.8)	0.3-1.8 (1.2)	0.6-4.1 (2.0)	3.8-8.5 (6.7)	0.4-1.9 (1.2)	0.7-2.7 (1.3)	0.4-4.4 (1.8)	0.8-11.7 (1.9)	0.2-0.5 (0.3)	1.1-3.0 (1.8)
	B	0.9-3.2 (1.8)	1.6-2.7 (2.1)	1.0-3.5 (2.4)	2.8-8.5 (6.1)	1.5-2.2 (1.8)	1.2-1.9 (1.5)	0.6-3.2 (1.6)	0.9-3.1 (2.0)	0.2-0.7 (0.4)	1.6-2.8 (2.0)

Table 3.3.1 (Contd 4)

Parameter	Level	Bedi	Navlakhi		Kandla		Mundra				
		Mar-1997	Mar-1996	Nov-2002	Feb-1998	Apr-2002	Mar-1997	Feb-1999	Mar-2000	Apr-2002	June-2003
P _{Total} (μmol/l)	S	1.7-4.0 (2.6)	-	-	-	-	1.6-2.0 (1.8)	0.7-1.5 (1.2)	-	-	2.0-2.9 (2.5)
	B	1.8-5.4 (3.0)	-	-	-	-	1.7-1.8 (1.7)	1.1-1.7 (1.5)		-	2.4-2.5 (2.5)
NO ₃ ⁻ -N (μmol/l)	S	3.2-15.1 (6.7)	0.6-4.3 (2.4)	3.3-7.3 (5.3)	8.0-10.7 (9.4)	5.5-12.1 (7.7)	1.4-6.9 (4.0)	ND-3.4 (2.1)	1.1-4.9 (2.8)	18.0-18.5 (18.3)	1.0-5.1 (3.1)
	B	3.6-12.9 (6.1)	ND-1.0 (0.5)	3.4-8.7 (5.9)	7.4-9.9 (8.6)	5.0-8.3 (7.1)	2.7-5.4 (3.7)	0.3-6.6 (2.0)	1.3-5.4 (3.0)	5.0-20.2 (19.0)	1.2-4.6 (3.0)
NO ₂ ⁻ -N (μmol/l)	S	0.2-0.6 (0.4)	0.1-0.4 (0.3)	0.3-0.7 (0.5)	0.4-0.6 (0.5)	0.5-0.9 (0.7)	0.2-0.9 (0.4)	0.1-0.9 (0.4)	0.2-0.9 (0.5)	ND-0.2 (0.1)	0.2-0.5 (0.4)
	B	0.2-0.5 (0.4)	0.4-1.1 (0.7)	0.2-0.6 (0.4)	0.4-0.9 (0.6)	0.2-0.4 (0.3)	0.3-0.8 (0.5)	0.1-0.6 (0.5)	0.3-1.3 (0.5)	ND-0.3 (0.2)	0.2-0.4 (0.4)
NH ₄ ⁺ -N (μmol/l)	S	0.1-1.2 (0.6)	0.9-1.2 (1.1)	0.2-0.5 (0.3)	0.2-0.9 (0.6)	0.2-1.9 (0.5)	0.5-1.7 (1.0)	0.4-6.4 (1.9)	ND-0.6 (0.4)	0.1-0.2 (0.2)	ND-1.9 (0.8)
	B	0.1-1.2 (0.4)	0.6-1.9 (1.2)	0.1-0.8 (0.4)	0.5-0.9 (0.7)	0.2-2.1 (0.5)	0.3-2.8 (1.4)	0.4-1.5 (1.0)	0.1-0.7 (0.5)	0.1-0.5 (0.3)	0.2-2.8 (1.4)
N _{Total} (μmol/l)	S	3.2-16.7 (6.9)	-	-	16.4-59.3 (29.6)	-	7.1-8.0 (7.8)	52.4-60.4 (55.9)	-	-	7.8-11.1 (9.5)
	B	3.3-16.4 (7.1)	-	-	17.1-82.9 (35.7)	-	5.6-8.6 (7.0)	37.6-57.1 (51.1)	-	-	7.3-8.5 (7.9)
PHc (μmol/l)	1m	1.5-4.8 (2.7)	1.0-2.1 (1.6)	1.9-5.9 (3.9)	2.6-3.5 (2.9)	1.4* (1.4)	2-3 (2)	0.7-4.4 (1.8)	1.3-9.9 (3.3)	3.3-4.1 (3.7)	4.5-4.7 (4.6)
Phenols (μmol/l)	S	7-29 (17)	1-25 (13)	16-114 (37)	39-60 (49)	73* (73)	ND-23 (15)	ND-176 (83)	ND-92 (35)	1.9-3.5 (2.7)	20-23 (22)

Average given in parenthesis

ND: Not Detected

* Single value

Table 3.3.2 : Water quality of the Gulf during postmonsoon (1993-2004)

Parameter	Level	Okha					Vadinar					Sikka		
		Nov 1995	Nov 1999	Nov 2002	Jan 2004	Nov 1994	Nov 1995	Jan 2000	Jan 2004	Dec 1993	Oct 1996	Nov 2002		
Temp (°C)	S	25.0-25.1 (25.1)	26.0-26.0 (26.0)	25.5-28.8 (26.7)	23.6-23.6 (23.6)	28.8-29.0 (29.0)	24.0-30.0 (26.8)	22.5-22.5 (22.5)	22.0-22.0 (22.0)	25.1-25.9 (25.3)	29.0-29.8 (29.4)	25.0-27.4 (26.2)		
	B	25.0-25.2 (25.1)	26.0-26.0 (26.0)	25.2-27.5 (26.5)	23.7-23.7 (23.7)	29.0-29.2 (29.1)	24.0-29.9 (26.7)	22.5-22.5 (22.5)	21.7-21.7 (21.7)	24.6-25.7 (25.1)	29.0-29.2 (29.1)	26.0-26.8 (26.4)		
pH	S	8.1-8.1 (8.1)	8.0-8.0 (8.0)	8.1-8.3 (8.3)	8.2-8.2 (8.2)	8.1-8.2 (8.1)	8.0-8.3 (8.2)	8.2-8.3 (8.3)	8.2-8.2 (8.2)	8.1-8.3 (8.2)	8.1*- (8.2)	8.2-8.3 (8.2)		
	B	8.0-8.1 (8.1)	8.0-8.1 (8.0)	8.2-8.3 (8.3)	8.2-8.2 (8.2)	8.0-8.2 (8.1)	8.0-8.3 (8.1)	8.2-8.3 (8.3)	8.2-8.2 (8.2)	8.2-8.3 (8.3)	8.1*- (8.3)	8.3-8.3 (8.3)		
SS (mg/l)	S	7-25 (16)	59*	4-10 (7)	22*	16-29 (22)	13-21 (16)	25-25 (25)	22*	15-23 (19)	40*	10-34 (22)		
	B	14-24 (19)	68*	6-308 (69)	90*	18-29 (24)	8-16 (12)	23-24 (24)	58*	17-24 (21)	36*	20-36 (22)		
Salinity (ppt)	S	35.4-35.7 (37.6)	36.8-36.9 (36.8)	37.1-38.4 (37.6)	36.0-36.2 (36.1)	34.3-34.6 (34.6)	36.2-37.8 (36.9)	37.4-38.0 (37.7)	37.0-37.0 (37.0)	37.1-38.5 (38.0)	36.3*- (37.8)	37.1-38.6 (37.8)		
	B	37.4-37.7 (36.8)	36.7-36.8 (34.6)	37.1-38.2 (37.6)	35.7-35.9 (35.8)	34.3-34.6 (34.6)	36.6-37.4 (37.0)	37.4-39.6 (38.0)	37.0-37.0 (37.0)	35.5-37.8 (36.9)	36.5*- (37.8)	37.0-38.7 (37.8)		
DO (ml/l)	S	4.3-4.7 (4.5)	3.6-3.8 (3.7)	2.5-4.9 (4.2)	4.5-4.5 (4.5)	4.1-4.8 (4.3)	4.0-5.5 (4.8)	5.3-5.7 (5.4)	4.5-4.8 (4.7)	3.6-5.4 (4.2)	4.3-4.5 (4.4)	2.6-4.7 (3.6)		
	B	4.3-4.5 (4.4)	3.2-3.8 (3.5)	2.7-4.8 (4.2)	4.5-4.8 (4.7)	4.3-5.0 (4.4)	4.0-5.3 (4.6)	5.0-5.3 (5.3)	4.8-5.0 (4.9)	3.5-5.5 (4.1)	4.3-4.5 (4.4)	2.1-4.4 (3.2)		
BOD (mg/l)	S	1.0-4.0 (3.0)	-	0.1-2.5 (0.8)	2.9*	1.5-2.5 (2.0)	0.8-1.8 (1.2)	2.9-3.6 (3.0)	1.0*	2.0-2.4 (2.2)	4.8*- (0.8)	<0.2-1.5 (0.8)		
	B	0.3-1.5 (0.9)	-	0.1-1.5 (0.9)	2.9*	0.3-1.0 (0.7)	0.5-2.2 (1.0)	2.3-2.6 (2.5)	1.6*	0.7-1.6 (1.1)	2.6*- (0.5)	<0.2-1.1 (0.5)		
PO ₄ ³⁻ -P (μmol/l)	S	1.2-1.3 (1.3)	1.8-1.8 (1.8)	0.9-2.2 (1.9)	1.1-1.1 (1.1)	1.0-2.4 (1.4)	0.6-1.7 (1.1)	1.4-1.7 (1.6)	1.2-1.2 (1.2)	0.7-4.0 (1.6)	0.9-1.2 (1.1)	0.8-2.8 (1.8)		
	B	1.3-1.3 (1.3)	2.1-2.2 (2.2)	0.8-2.3 (1.9)	1.1-1.1 (1.1)	0.1-2.7 (0.5)	0.7-2.3 (1.5)	1.7-1.8 (1.7)	1.2-1.4 (1.3)	1.2-1.8 (1.5)	- (1.9)*	1.5-2.3 (1.9)		

Table 3.3.2 (Contd 2)

Parameter	Level	Okha				Vadinar				Sikka		
		Nov 1995	Nov 1999	Nov 2002	Jan 2004	Nov 1994	Nov 1995	Jan 2000	Jan 2004	Dec 1993	Oct 1996	Nov 2002
P _{Total} (µmol/l)	S	-	-	-	-	-	-	-	-	-	-	-
	B	-	-	-	-	-	-	-	-	-	-	-
NO ₃ -N (µmol/l)	S	3.6-6.6 (5.1)	3.4-9.5 (9.0)	7.9-13.0 (9.5)	4.8-8.7 (6.8)	3.1-7.9 (5.5)	2.1-10.6 (6.7)	7.7-8.7 (8.2)	2.9-3.3 (3.1)	4.4-8.1 (6.5)	17.1-18.1 (17.6)	8.0-12.3 (10.1)
	B	4.6-7.2 (5.9)	9.3-9.7 (9.5)	7.1-12.1 (9.2)	6.5-6.9 (6.7)	3.3-7.3 (4.6)	4.2-11.1 (8.0)	7.2-10.0 (8.9)	2.7-3.6 (3.2)	3.7-8.1 (6.1)	16.5-18.9 (17.7)	7.5-11.5 (9.5)
NO ₂ -N (µmol/l)	S	0.6-0.7 (0.7)	0.3-0.4 (0.4)	0.4-0.5 (0.4)	0.3-0.3 (0.3)	0.4-1.1 (0.8)	0.1-0.5 (0.3)	0.3-0.3 (0.3)	0.3-0.3 (0.3)	0.2-1.1 (0.4)	0.2-0.6 (0.4)	0.2-0.4 (0.3)
	B	0.6-0.7 (0.7)	0.2-0.2 (0.2)	0.4-0.6 (0.5)	0.2-0.3 (0.3)	0.6-0.9 (0.8)	0.1-0.4 (0.3)	0.3-0.4 (0.4)	0.2-0.3 (0.3)	0.1-2.8 (0.4)	0.4-0.6 (0.5)	0.1-0.7 (0.4)
NH ₄ ⁺ -N (µmol/l)	S	ND	0.8-1.7 (1.3)	0.3-1.8 (0.6)	0.8-2.1 (1.5)	0.3-2.8 (1.1)	0.1-1.5 (0.6)	0.2-0.5 (0.3)	1.0-1.3 (1.2)	2.0-7.8 (3.7)	0.3-0.5 (0.4)	0.3-1.0 (0.6)
	B	-	0.6-0.8 (0.7)	0.2-7.8 (1.2)	ND-0.2 (0.2)	0.4-4.9 (1.3)	ND-1.2 (0.6)	0.1-0.2 (0.2)	ND-1.2 (0.6)	1.6-4.8 (3.2)	- (0.5)	0.1-0.8 (0.4)
N _{Total} (µmol/l)	S	-	56*	-	-	38.1-100.5 (69.3)	-	-	-	-	-	-
	B	-	62*	-	-	80.5-124.9 (102.7)	-	-	-	-	-	-
Pic (µg/l)	1m	0.5-0.7 (0.6)	1.8*	0.7-1.5 (1.2)	-	2.5 (4)	4-5 (5.0)	0.1-0.3 (0.2)	-	5-7 (6)	(2.3)*	0.9-1.7 (1.3)
Phenols (µg/l)	S	10-19 (15)	37*	1-15 (8)	-	28-34 (31)	18-42 (31)	11-31 (21)	-	19-22 (21)	(18)*	ND-21 (21)

Table 3.3.2 (Contd 3)

Parameter	Level	Bedi Oct 1997	Salaya		Naviakhi		Kandla			Mundra				
			Nov 2002	Nov 1994	Nov 2002	Nov 1994	Oct 1996	Nov 2002	Jan 2004	Sep 1999	Nov 2002	Oct 2003	Dec 2004	
Temp (°C)	S	28.0- 30.1 (29.2)	23.0- 27.9 (25.4)	25.5- 26.1 (25.8)	23.0- 27.5 (25.7)	29.5- 29.5 (29.5)	24.8- 30.0 (27.2)	20.1- 20.1 (20.1)	28.5-31.0 (29.9)	24.0-27.0 (25.5)	28.5-30.0 (28.8)	24.0-24.0 (24.0)		
	B	28.0- 30.9 (29.1)	23.0- 26.4 (24.7)	24.7- 26.5 (25.2)	24.0- 27.0 (25.6)	29.5- 30.5 (30.0)	24.9- 29.0 (26.9)	19.9- 19.9 (19.9)	28.5-31.6 (30.1)	23.2-26.9 (25.5)	28.0-29.9 (28.7)	23.5-23.5 (23.5)		
pH	S	8.2-8.4 (8.3)	8.1-8.3 (8.2)	7.8-7.9 (7.9)	8.3-8.6 (8.5)	8.0-8.2 (8.1)	7.9-8.3 (8.2)	8.2-8.2 (8.2)	7.9-8.3 (8.2)	8.0-8.3 (8.1)	8.1-8.2 (8.1)	8.4-8.4 (8.4)		
	B	8.2-8.4 (8.3)	8.2-8.3 (8.2)	(7.9)*	8.3-8.6 (8.5)	8.0-8.1 (8.0)	8.1-8.3 (8.2)	8.2-8.2 (8.2)	7.9-8.3 (8.2)	8.1-8.3 (8.2)	8.1-8.2 (8.2)	8.4-8.4 (8.4)		
SS (mg/l)	S	32-63 (44)	28-304 (166)		16-110 (742)	156- 336 (244)	28-104 (60)	164*	49-170 (108)	30-162 (96)	38-86 (62)	44*		
	B	26-136 (78)	208- 490 (349)	(698)*	80-190 (126)	252- 373 (312)	42-94 (72)	178*	70-207 (128)	108-214 (161)	72-166 (95)	60*		
Salinity (ppt)	S	36.3- 37.8 (37.1)	41.2- 46.3 (43.7)	32.1- 32.8 (32.4)	37.3- 39.0 (38.1)	40.0- 40.4 (40.2)	36.5- 40.1 (38.3)	38.2- 38.2 (38.2)	36.9-39.2 (38.2)	40.7-42.4 (41.5)	36.5-37.0 (36.7)	37.2-37.8 (37.5)		
	B	36.3- 37.8 (37.3)	41.6- 45.8 (43.7)	32.1- 32.1 (32.1)	37.5- 39.0 (38.0)	40.2- 40.2 (40.2)	37.4- 40.1 (38.4)	38.0- 38.0 (38.0)	37.1-39.0 (38.2)	41.0-42.3 (41.6)	36.2-37.0 (36.7)	37.4-37.6 (37.5)		
DO (ml/l)	S	3.7-4.9 (4.3)	3.0-5.1 (4.0)	4.8-4.8 (4.8)	4.8-7.6 (6.2)	4.3-4.7 (4.5)	6.1-7.8 (6.9)	4.5-4.5 (4.5)	1.5-5.7 (3.6)	2.2-5.0 (3.6)	3.8-5.4 (4.5)	4.9-4.9 (4.9)		
	B	3.5-4.7 (4.1)	2.6-5.0 (3.8)	4.8-5.0 (4.8)	3.6-7.6 (5.7)	4.7-4.7 (4.7)	5.8-8.0 (7.0)	4.5-4.8 (4.7)	2.0-5.1 (3.5)	2.2-5.3 (3.7)	2.9-5.2 (4.1)	4.7-4.9 (4.8)		
BOD (mg/l)	S	2.2-6.3 (4.9)	0.9-1.4 (1.2)	(2.0)*	0.1-2.5 (0.8)	3.9-4.1 (4.0)	0.2-5.9 (2.1)	0.6*	<0.1-4.1 (1.4)	0.8-1.3 (1.0)	2.3-4.8 (3.6)	2.6*		
	B	0.7-4.7 (2.5)	0.5-1.5 (1.0)	<0.1*	0.1-1.5 (0.9)	3.2-3.5 (3.4)	0.2-4.5 (1.6)	0.6*	<0.1-4.0 (0.9)	0.9-2.0 (1.4)	0.9-2.3 (1.6)	1.7*		

Table 3.3.2 (Contd 4)

Parameter	Level	Navlakhi					Kandla			Mundra				
		Bedi Oct 1997	Salaya Nov 2002	Nov 1994	Nov 2002	Oct 1996	Nov 2002	Oct 1996	Nov 2002	Jan 2004	Sep 1999	Nov 2002	Oct 2003	Dec 2004
PO ₄ ³⁻ -P (µmol/l)	S	1.0-3.0 (2.1)	0.2-2.0 (1.1)	1.5-2.0 (1.7)	0.9-2.2 (1.9)	0.8-1.3 (1.1)	0.4-3.1 (1.7)	1.8-1.8 (1.8)	0.5-2.5 (1.4)	1.0-1.6 (1.3)	0.5-1.3 (0.9)	1.3-1.4 (1.4)		
	B	1.3-5.2 (2.9)	1.2-4.1 (2.6)	2.0-2.1 (2.0)	0.8-2.3 (1.9)	1.2-1.6 (1.4)	1.9-2.6 (2.2)	2.0-2.1 (2.1)	0.7-3.0 (1.7)	1.6-2.1 (1.8)	0.8-1.3 (1.1)	1.5-1.7 (1.6)		
P _{Total} (µmol/l)	S	1.6-3.8 (2.7)	-	-	-	-	-	-	-	-	-	-		
	B	1.8-5.7 (4.2)	-	-	-	-	-	-	-	-	-	-		
NO ₃ ⁻ -N (µmol/l)	S	2.9-16.7 (7.4)	6.9-15.2 (11.0)	25.4-38.4 (31.9)	8.8-12.3 (10.6)	7.3-9.9 (9.6)	5.4-18.7 (10.4)	10.5-12.1 (11.3)	0.7-10.0 (4.3)	6.9-28.6 (17.7)	1.3-3.7 (2.5)	4.3-5.4 (4.9)		
	B	2.4-15.1 (8.9)	8.1-12.2 (10.1)	30.4-30.8 (30.6)	8.0-12.3 (9.8)	10.9-11.5 (11.2)	5.9-18.4 (10.4)	12.6-12.7 (12.7)	0.3-7.1 (4.0)	17.0-25.9 (21.4)	0.2-3.3 (2.0)	3.1-4.2 (3.7)		
NO ₂ ⁻ -N (µmol/l)	S	0.1-1.5 (0.9)	0.3-0.7 (0.5)	0.1-0.2 (0.1)	0.1-0.3 (0.2)	0.8-0.9 (0.9)	0.1-0.5 (0.3)	ND-0.1 (0.1)	0.1-0.9 (0.4)	0.3-0.6 (0.4)	0.2-0.6 (0.4)	0.3-0.3 (0.3)		
	B	0.3-1.6 (1.1)	0.2-0.9 (0.5)	0.1-0.1 (0.1)	0.1-0.3 (0.2)	0.6-0.9 (0.8)	0.2-0.5 (0.3)	ND-ND (ND)	0.2-1.0 (0.4)	0.2-0.8 (0.5)	0.1-0.3 (0.2)	0.3-0.3 (0.3)		
NH ₄ ⁺ -N (µmol/l)	S	0.4-2.1 (1.2)	0.5-2.4 (1.4)	0.8-3.0 (1.9)	0.3-1.5 (0.6)	0.5-1.1 (0.8)	0.2-1.3 (0.7)	2.1-2.6 (2.4)	ND-3.6 (0.6)	1.1-5.4 (3.2)	0.2-3.9 (1.6)	0.5-1.3 (0.9)		
	B	0.4-3.9 (2.1)	ND-3.1 (1.5)	1.1-1.3 (1.2)	0.2-1.0 (0.6)	0.5-0.9 (0.7)	0.2-1.1 (0.5)	2.3-2.7 (2.5)	ND-2.1 (0.5)	0.7-2.1 (1.4)	0.1-1.4 (0.5)	0.1-0.2 0.2		
N _{Total} (µmol/l)	S	3.7-17.9 (10.0)	-	-	-	-	-	-	-	-	8.7-12.8 (10.8)	-		
	B	7.1-17.1 (13.3)	-	-	-	-	-	-	-	-	6.1-8.0 (7.1)	-		
PHe (µmol/l)	1m	1.2-8.0 (5.1)	1.3-3.0 (2.1)	-	0.9-1.4 (1.1)	1.6-2.0 (1.8)	0.7-1.9 (1.1)	-	0.3-2.5 (1.1)	1.3-4.6 (2.9)	8.6-19.4 (14.0)	26.3*		
	S	6-32 (20)	ND-53 (27)	-	9-13 (15)	11-16 (14)	ND-44 (31)	-	ND-133 (38)	4-23 (13)	2-10 (6)	57*		

Average given in parenthesis, ND: Not Detected, * Single value

Table 3.3.3 : Subtidal sediment quality of the Gulf during premonsoon (1994-2005)

Constituents	Premonsoon											
	Okha			Vadinar			Sikka			Bedi		
	Mar 1999	Apr 2002	Apr 1994	Mar 1996	Apr 1994	Mar 1997	Apr 2002	Apr 2003	Mar 1997	Apr 2002	Apr 2003	Mar 1997
Al (%)	0.8-2.0 (1.6)	1.8-8.1 (4.9)	3.7-9.6 (7.0)	5.0-6.2 (5.5)	-	1.5-5.7 (3.4)	4.7	0.4-8.4 (5.2)	2.9-6.6 (4.4)			
Cr (µg/l)	12-39 (20)	20-112 (67)	30-87 (63)	41-59 (47)	27-127 (48)	28-112 (75)	68	6-51 (23)	48-189 (133)			
Mn (µg/l)	257-1696 (639)	425-726 (580)	517-1229 (802)	287-512 (399)	443-936 (633)	408-987 (692)	590	508-3065 (1450)	493-775 (664)			
Fe (%)	0.9-1.1 (1.0)	0.8-4.4 (2.5)	1.4-4.3 (3.2)	3.6-4.9 (4.1)	2.0-6.1 (3.0)	1.0-4.6 (3.2)	2.3	0.1-9.8 (3.3)	2.0-5.2 (3.8)			
Co (µg/g)	20-29 (24)	1-29 (10)	24-44 (36)	2-78 (44)	37-65 (38)	11-36 (25)	9	12-47 (26)	28-53 (41)			
Ni (µg/g)	11-17 (15)	10-60 (33)	31-61 (47)	59-70 (64)	21-75 (34)	11-67 (51)	29	32-112 (68)	24-67 (51)			
Cu (µg/g)	8-16 (12)	5-34 (16)	32-70 (51)	41-51 (44)	24-90 (32)	9-52 (34)	19	11-97 (44)	16-72 (40)			
Zn (µg/g)	17-25 (22)	13-92 (43)	44-134 (92)	48-94 (77)	39-101 (59)	15-84 (50)	23	109-401 (227)	39-122 (72)			
Hg (µg/g)	0.04-0.12 (0.07)	0.009-0.04 (0.02)	-	-	-	0.09-0.40 (0.17)	0.009	ND-0.26 (0.07)	0.1-0.3 (0.2)			
Pb (µg/g)	-	-	1-12 (7)	17-21 (20)	ND-5 (1.2)	-	-	-	-			
C (%)	0.1-0.8 (0.3)	0.2-0.7 (0.7)	-	-	-	0.1-0.8 (0.4)	0.4	0.2-1.0 (0.6)	-			
P (µg/g)	425-736 (646)	349-545 (455)	-	-	-	580-832 (731)	470	210-953 (525)	-			
PHc (µg/g)	ND-3.1 (1.2)	0.7-1.4 (1.0)	0.2-2.3 (0.6)	0.2-0.4 (0.3)	0.3-1.0 (0.5)	0.08-0.33 (0.20)	0.7	0.1 (0.1)	0.3-1.0 (0.4)			

Table 3.3.3 (Contd. 2)

Constituents	Premonsoon									
	Kandla			Mundra			Salaya	Navlakhi		
	Mar 1996	Feb 1998	Apr 2002	Mar 1999	Mar 2000	Apr 2002			Jun 2003	April 2002
Al (%)	1.7-6.9 (4.6)	1.7-7.9 (5.4)	7.5	0.5-9.3 (5.7)	2.4-8.5 (4.6)	8.7	1.4-9.6 (4.9)	6.8	7.3	
Cr (µg/l)	9-103 (63)	26-76 (45)	98	7-175 (110)	26-139 (86)	140	27-123 (73)	87	113	
Mn (µg/l)	594-1321 (985)	428-757 (597)	623	431-900 (700)	316-837 (603)	681	536-1182 (767)	677	808	
Fe (%)	0.9-4.7 (2.9)	1.2-6.2 (4.1)	3.6	1.1-5.0 (3.5)	1.5-46 (38)	5.0	1.3-5.1 (3.6)	3.7	5.0	
Co (µg/g)	9-31 (23)	16-32 (26)	18	15-70 (35)	15-39 (29)	27	ND-20 (8)	20	24	
Ni (µg/g)	15-58 (41)	9-60 (38)	45	ND-68 (39)	15-59 (38)	64	7-59 (35)	48	65	
Cu (µg/g)	11-45 (28)	6-51 (32)	31	6-47 (24)	6-44 (26)	54	5-44 (19)	29	50	
Zn (µg/g)	18-89 (60)	12-77 (58)	50	14-106 (62)	33-92 (70)	76	31-151 (87)	61	74	
Hg (µg/g)	0.13-0.26 (0.18)	0.07-0.13 (0.11)	0.04	0.07-0.66 (0.62)	0.19-0.76 (0.34)	0.02	ND-0.05 (0.03)	0.05	0.05	
Pb (µg/g)	6.8-17.2 (12.3)	-	-	-	-	-	-	-	-	
C (%)	-	-	0.7	0.1-0.9 (0.5)	0.1-0.7 (0.4)	0.9	ND-0.8 (0.4)	0.5	0.8	
P (µg/g)	-	-	417	341-882 (607)	493-755 (633)	589	465-1822 (751)	581	629	
PHC (µg/g)	0.2-21.6 (3.0)	0.1-0.4 (0.2)	<0.1	0.1-2.8 (1.8)	0.7-1.7 (1.3)	0.2	ND-0.4 (0.2)	0.6	1.0	

Dry wt basis except PHC which is wet wt basis, ND : Not Detected, Average in parenthesis

Table 3.3.4 : Subtidal sediment quality of the Gulf during postmonsoon (1993-2004)

Constituents	Postmonsoon									
	Okha					Vadinar				
	Nov 95	Nov 99	Nov 2002	Nov 2004	Nov 94	Nov 95	Nov 2004	Dec 93	Oct 96	Nov 2002
Al (%)	0.8-3.4 (2.2)	1.6-4.3 (2.5)	0.4-5.1 (2.8)	3.7-6.1 (4.5)	4.1-9.6 (6.9)	4.7-5.8 (5.2)	2.1-11.0 (6.9)	-	4.8-5.2 (5.0)	5.0-7.8 (6.4)
Cr (µg/g)	18-49 (31)	ND-55 (19)	9-92 (51)	36-68 (48)	30-69 (52)	38-65 (49)	40-118 (94)	29-104 (68)	80-137 (102)	154-197 (176)
Mn (µg/g)	340-700 (592)	290-470 (389)	607-610 (609)	365-497 (415)	743-1222 (924)	720-1010 (815)	210-1103 (596)	497-900 (775)	1117-1539 (1258)	817-1054 (936)
Fe (%)	1.5-3.0 (2.4)	0.9-2.6 (1.5)	0.3-3.3 (1.8)	1.4-2.1 (1.7)	1.4-3.5 (2.7)	1.9-3.6 (2.7)	0.8-5.6 (3.8)	2.0-6.5 (4.8)	4.1-4.7 (4.7)	4.7-5.8 (5.3)
Co (µg/g)	7-27 (19)	21-38 (30)	ND-8 (4)	4-96 (35)	24-44 (34)	20-70 (45)	6-23 (17)	37-65 (54)	31-48 (37)	ND-18 (9)
Ni (µg/g)	13-29 (20)	10-28 (17)	ND-34 (17)	14-28 (19)	38-61 (49)	33-50 (38)	35-73 (55)	21-75 (58)	65-86 (70)	58-67 (63)
Cu (µg/g)	8-26 (16)	5-24 (12)	5-43 (24)	20-21 (21)	33-70 (52)	36-65 (48)	7-59 (41)	27-90 (73)	50-85 (62)	64-92 (78)
Zn (µg/g)	21-32 (28)	15-44 (25)	62-69 (66)	27-63 (41)	79-134 (110)	69-131 (101)	63-154 (126)	39-101 (75)	88-93 (91)	83-85 (84)
Hg (µg/g)	0.01-0.10 (0.04)	-	0.06-0.09 (0.07)	0.05-0.17 (0.09)	-	-	ND-0.02 (0.01)	-	-	0.09-0.11 (0.10)
Pb (µg/g)	2-15 (10)	-	-	-	6-12 (9)	6-10 (8)	-	ND	3.5-11.8 (8.5)	-
C (%)	-	0.1-1.6 (0.5)	0.2-0.6 (0.4)	0.4-0.7 (0.6)	-	-	-	-	-	0.5-0.8 (0.7)
P (µg/g)	-	410-709 (555)	626-688 (657)	594-738 (657)	694-815 (771)	-	76-985 (701)	-	-	650-704 (677)
PHc (µg/g)	ND-0.3 (0.1)	0.3-0.8 (0.4)	-	0.4-1.0 (0.7)	ND-0.9 (0.4)	0.2-1.0 (0.3)	0.2-1.0 (0.4)	0.3-1.0 (0.6)	0.3-0.5 (0.4)	-

Table 3.3.4 (Contd 2)

Constituents	Postmonsoon										
	Bedi	Navlakhi		Kandla		Mundra				Salaya	
		Oct-97	Nov 94	Nov 2002	Oct 96	Nov 2002	Sep-99	Nov 2002	Oct 2003		Dec 2004
Al (%)	2.9-6.6 (4.4)	-	6.6	2.9-6.3 (4.4)	7.0	2.5-6.7 (5.6)	0.4	1.3-4.8 (3.1)	1.4-9.6 (4.3)	5.9	
Cr (µg/g)	48-189 (133)	75-194 (100)	94	50-103 (69)	83	18-80 (53)	12	18-41 (30)	27-123 (73)	86	
Mn (µg/g)	493-775 (664)	549-1188 (944)	834	797-1321 (1033)	838	361-832 (684)	353	312-490 (401)	536-1182 (766)	611	
Fe (%)	2.0-5.2 (3.8)	1.4-3.6 (2.4)	3.8	1.6-3.4 (2.6)	3.5	1.5-4.7 (3.8)	0.5	0.8-2.4 (1.6)	1.3-5.1 (3.6)	3.3	
Co (µg/g)	28-53 (41)	34-39 (36)	7	14-29 (23)	10	11-34 (28)	ND	2-8 (5)	ND-20 (8)	8	
Ni (µg/g)	24-67 (51)	37-63 (51)	47	20-58 (40)	41	15-59 (46)	ND	6-21 (14)	7-59 (35)	39	
Cu (µg/g)	16-72 (46)	24-46 (34)	36	11-36 (25)	34	3-39 (27)	7	10-16 (13)	5-44 (20)	41	
Zn (µg/g)	39-122 (72)	33-157 (78)	96	34-88 (61)	93	13-79 (61)	15	20-48 (34)	31-151 (87)	68	
Hg (µg/g)	0.1-0.3 (0.2)	ND-0.40 (0.20)	0.11	0.13-0.26 (0.18)	0.08	0.3-0.69 (0.44)	0.08	-	ND-0.01 (0.01)	0.12	
Pb (µg/g)	-	7.0-11.0 (10.0)	-	8.6-17.2 (12.9)	-	-	-	-	-	-	
C (%)	-	-	0.7	-	0.6	0.1-0.8 (0.6)	0.1	0.1-0.2 (0.2)	ND-0.2 (0.1)	1.0	
P (µg/g)	-	-	786	-	703	337-1402 (1027)	327	102-275 (189)	469-1822 (812)	1049	
PHc (µg/g)	0.3-1.0 (0.4)	0.2-1.2 (0.5)	-	0.7-1.4 (1.0)	-	0.1-0.4 (0.3)	-	-	ND-0.2 (0.1)	-	

Dry wt basis except PHc which is wet wt basis, ND : Not Detected, Average in parenthesis

Table 3.3.5 : List of algae recorded along the intertidal zone of the Gulf.

Name	Status
Chlorophyceae	
<i>Boodlea composita</i>	C
<i>Bryopsis indica</i>	C
<i>B. plumose</i>	C
<i>B. ramulosa</i>	C
<i>Caulerpa crassifolia</i>	C
<i>C. cupressoides</i>	C
<i>C. racemosa</i>	C
<i>C. scalpelliformis</i>	C
<i>C. sertularioides</i>	C
<i>C. taxiformes</i>	C
<i>C. verticillata</i>	C
<i>Chaetomorpha indica</i>	C
<i>Chamaedoris auriculata</i>	C
<i>Cladophora glomerata</i>	C
<i>C. prolifera</i>	C
<i>Codium decorticatum</i>	R
<i>C. dwarkensis</i>	C
<i>C. elongatum</i>	C
<i>Dictyosphaeria cavernosa</i>	C
<i>Enteromorpha intestinalis</i>	C
<i>Halideda tuna</i>	C
<i>Pseudobryopsis mucronata</i>	R
<i>Spongomorpha sp.</i>	C
<i>Udoea indica</i>	C
<i>Ulva fasciata</i>	C
<i>U. lactuca</i>	C
<i>U. reticulata</i>	R
<i>Valonia utricularis</i>	R
<i>Valloniopsis spachynema</i>	R

Table 3.3.5 (Contd 2)

Name	Status
<i>Valonia utricularis</i>	R
<i>Valloniopsis spachynema</i>	R
Phaeophyceae	
<i>Colpomenia sinuosa</i>	C
<i>Cystoceira indica</i>	C
<i>Dictyota atomaria</i>	C
<i>D. bartayrisiana</i>	R
<i>D. cervicornis</i>	R
<i>D. ciliolate</i>	C
<i>D. dichotoma</i>	C
<i>D. divaricata</i>	R
<i>Dictyopteris australis</i>	C
<i>D. woodwardii</i>	C
<i>Ectocarpus sp.</i>	C
<i>Hinskia mitchelle</i>	C
<i>Hormophysa triquetra</i>	R
<i>Hydroclathrus clathratus</i>	R
<i>Iyengaria stellata</i>	C
<i>Myriogloea sciurus</i>	R
<i>Nemacystus decipiens</i>	R
<i>Padina gymnospora</i>	R
<i>P. tetrastromatica</i>	C
<i>Pocockiella sp.</i>	C
<i>Rosenvingia intricata</i>	R
<i>Sargassum johnstonii</i>	C
<i>S. tenerrimum</i>	C
<i>S. plagiophyllum</i>	R
<i>S. swartzii</i>	C
<i>S. wisghtii</i>	R
<i>Spathoglossum asperum</i>	R
<i>S. variabile</i>	C

Table 3.3.5 (Contd 3)

Name	Status
<i>Stoechospermum marginatum</i>	C
<i>Spathoglossum asperum</i>	R
<i>S. variable</i>	C
<i>Stoechospermum marginatum</i>	C
<i>Turbinaria ornata</i>	R
Rhodophyceae	
<i>Acanthophora delilei</i>	C
<i>A. specifera</i>	R
<i>Amphiroa fragilissima</i>	R
<i>Asparogopsis taxiformis</i>	C
<i>Botryocladia leptapoda</i>	C
<i>Calaglossa bombayance</i>	R
<i>Ceramium sp.</i>	C
<i>Champia indica</i>	C
<i>Chondria ornata</i>	R
<i>C. dasyphylla</i>	R
<i>Coelarthrum opuntia</i>	C
<i>Corallina officinalis</i>	C
<i>Corynomorpha prismatica</i>	R
<i>Cryptopleur sp.</i>	R
<i>Dasya sp.</i>	R
<i>Desmia hornmanni</i>	R
<i>Gastroclonium iyengarii</i>	R
<i>Galaxaura oblongata</i>	C
<i>Gelidiella acerosa</i>	C
<i>Gelidiospsis gracilis</i>	C
<i>Gigartina sp</i>	R
<i>Gracilaria corticata</i>	R
<i>G. pygmaea</i>	C
<i>Gastroclonium iyengarii</i>	R
<i>Galaxaura oblongata</i>	C
<i>Gelidiella acerosa</i>	C

Table 3.3.5 (Contd 4)

Name	Status
<i>Gelidiospsis gracilis</i>	C
<i>Gigartina sp</i>	R
<i>Gracilaria corticata</i>	R
<i>G. pygmaea</i>	C
<i>G. verrucosa</i>	R
<i>Grateloupia inica</i>	C
<i>G. felicina</i>	R
<i>Haloplegma sp.</i>	R
<i>Halymenia floresia</i>	R
<i>H. porphyroides</i>	C
<i>H. venusta</i>	C
<i>Helminthocladia clayadosii</i>	C
<i>Heterosiphonia muelleri</i>	C
<i>Hypnea cervicornis</i>	C
<i>H. musciformis</i>	C
<i>Hypoglossum spathulatum</i>	R
<i>Laurencia papillosa</i>	C
<i>L. pedicularioides</i>	C
<i>Liagora cerenoides</i>	R
<i>Lophocladia lallemandi</i>	R
<i>Neurymenia fraxinifolia</i>	R
<i>Polysiphonia sp.</i>	C
<i>Rhodymenia australis</i>	C
<i>R. palmate</i>	C
<i>Scinaia indica</i>	C
<i>S. furcellata</i>	R
<i>Sebdenia polydactyla</i>	C
<i>Spyridia alternans</i>	C
<i>Soleria robusta</i>	C

*C: common; R: rare

Source: Saurashtra University (1991)

Table 3.3.6 : Biological characteristics of the Gulf during premonsoon (1981-2005).

Parameter	Okha				
	April 1981	March 1995	March 1999	April 2002	April 2003
Phytoplankton					
Chlorophyll a (mg/m ³)	1.1-6.9 (4.3)	0.5-1.1 (0.7)	0.5-1.1 (0.6)	0.5-2.7 (1.1)	0.1-0.2 (0.2)
Phaeophytin (mg/m ³)	-	0.4-1.3 (0.7)	0.4-1.3 (0.7)	0.1-0.6 (0.2)	0.5-0.8 (0.6)
Cell counts (nox10 ³ /l)	-	36.6-45.6 (41.1)	49.2-775.2 (412.2)	16.5-116.5 (48.5)	15.3-24.0 (20.5)
Total genera (no)	-	8-8 (8)	7-8 (8)	14-21 (17)	15-19 (18)
Zooplankton					
Biomass (ml/100m ³)	0.3-0.6 (0.5)	0.4-0.7 (0.5)	6.9-7.2 (7.0)	0.3-7.5 (2.7)	1.5-4.5 (3.2)
Population (nox10 ³ /100m ³)	-	0.2-0.4 (0.3)	0.4-1.0 (0.7)	2.0-29.3 (14.1)	6.5-13.0 (8.5)
Total groups (no)	-	6-8 (7)	10-11 (11)	9-20 (15)	12-13 (13)
Macrobenthos					
Biomass (g/m ² , wet wt)	-	0.1	<0.1	0.1	2.2-3.7 (3.2)
Population (no/m ²)	2700	200	13	341	375-1250 (828)
Total groups (no)	9	4	1	9	3-8 (7)

Table 3.3.6(Contd 2)

Parameter	Vadinar			
	April 1994	March 1996	April 2002	May 2005
Phytoplankton				
Chlorophyll a (mg/m ³)	1.1-1.1 (1.1)	1.1-2.7 (1.3)	0.5-1.6 (0.8)	0.2-0.6 (0.3)
Phaeophytin (mg/m ³)	0.8-1.6 (1.0)	0.1-3.8 (1.5)	0.2-1.3 (0.8)	0.1-1.7 (0.5)
Cell counts (nox10 ³ /l)	47.2 (47.2)	15.8-42.8 (29.4)	2.5-29.6 (11.9)	6.1-71.2 (21.8)
Total genera (no)	25 (25)	9-11 (10)	8-21 (13)	10-22 (17)
Zooplankton				
Biomass (ml/100m ³)	12.1-18.9 (15.5)	3.0 (3.0)	<0.1-3.7 (1.2)	0.9-12.5 (4.6)
Population (nox10 ³ /100m ³)	12.8-16.8 (14.8)	1.6 (1.6)	0.2-23.9 (6.2)	1.6-36.3 (12.3)
Total groups (no)	13-15 (14)	11 (11)	12-20 (16)	6-19 (16)
Macrobenthos				
Biomass (g/m ² , wet wt)	6.1	3.0	10.3	3.1
Population (no/m ²)	2725	1392	3693	739
Total groups (no)	9	8	17	6

Table 3.3.6(Contd 3)

Parameter	Sikka					
	April 1994	March 1997	May 2001	April 2002	April 2003	February 2005
Phytoplankton						
Chlorophyll a (mg/m ³)	1.1-2.7 (1.6)	0.5-1.1 (0.8)	0.5-4.8 (1.6)	0.5-1.1 (0.6)	1.1-0.2 (0.2)	0.2-0.4 (0.2)
Phaeophytin (mg/m ³)	0.3-3.1 (1.2)	0.1-0.6 (0.3)	0.1-6.2 (1.0)	0.2-1.3 (0.8)	0.5-0.8 (0.6)	0.1-0.7 (0.3)
Cell counts (nox10 ³ /l)	35.0-61.0 (58.0)	25.2-41.2 (33.2)	0.5-719 (122)	6.2-28.0 (14.6)	15.3-24.0 (20.5)	4.0-54.4 (10.1)
Total genera (nc)	4-18 (9)	6-7 (7)	5-21 (18)	12-23 (18)	15-19 (18)	8-20 (12)
Zooplankton						
Biomass (ml/100m ³)	0.8-13.3 (3.3)	1.5-1.5 (1.5)	1.8-28.2 (8.4)	0.3-8.5 (4.1)	1.5-4.5 (3.2)	0.1-10.0 (2.0)
Population (nox10 ³ /100m ³)	1.9-44.8 (9.9)	3.4-4.7 (4.1)	6.9-118 (31.9)	1.9-49.3 (22.8)	6.5-13.0 (8.5)	0.2-28.8 (5.6)
Total groups (no)	7-14 (12)	10-14 (12)	11-15 (14)	11-20 (16)	12-13 (13)	4-15 (12)
Macrobenthos						
Biomass (g/m ² , wet wt)	25.5	116.0	<0.1-3.04 (0.75)	2.7 (2.7)	2.2-3.7 (3.2)	0.1-4.11 (1.7)
Population (no/m ²)	2525	8050	50-834 (292)	1782 (1782)	375-1250 (828)	100-1850 (918)
Total groups (no)	11	10	1-5 (3)	10 (10)	3-8 (7)	3-9 (6)
						2-8 (6)

Table 3.3.6(Contd 4)

Parameter	Bedi	Navlakhi	
	March 1997	February 1987	April 2002
Phytoplankton			
Chlorophyll a (mg/m ³)	0.5-5.9 (1.5)	0.5-3.8 (1.6)	0.5-1.1 (0.7)
Phaeophytin (mg/m ³)	0.1-7.6 (1.5)	0.1-0.8 (0.4)	0.2-1.3 (0.8)
Cell counts (nox10 ³ /l)	38.0-936.0 (159.0)	-	1.7-13.5 (7.2)
Total genera (no)	7-15 (10)	-	7-19 (11)
Zooplankton			
Biomass (ml/100m ³)	0.5-25.5 (6.4)	18.8-95.0 (53.3)	0.5-3.2 (1.9)
Population (nox10 ³ /100m ³)	1.6-220.0 (48.1)	59.0-192.0 (117.3)	2.8-34.1 (16.9)
Total groups (no)	5-15 (10)	-	11-20 (15)
Macrobenthos			
Biomass (g/m ² , wet wt)	7.8	<0.1	<0.1
Population (no/m ²)	2944	72	25
Total groups (no)	9	-	1

Table 3.3.6(Contd 5)

Parameter	Kandla			
	February 1987	March 1996	February 1998	April 2002
Phytoplankton				
Chlorophyll a (mg/m ³)	0.1-0.5 (0.4)	0.5-0.5 (0.5)	0.5-2.1 (1.1)	0.5-2.1 (1.1)
Phaeophytin (mg/m ³)	0.1-1.7 (1.0)	0.2-0.6 (0.3)	0.1-1.7 (1.0)	0.3-1.3 (0.8)
Cell counts (no $\times 10^3$ /l)		4.6-170.0 (67.7)	30.2-45.1 (36.2)	8.4-22.4 (14.5)
Total genera (no)		7-15 (11)	6-8 (7)	9-19 (13)
Zooplankton				
Biomass (ml/100 m ³)	17.0-56.3 (37.0)	4.4-18.5 (11.5)	3.8-24.1 (14.3)	1.6-6.3 (3.2)
Population (no $\times 10^3$ /100 m ³)	31.0-98.5 (67.0)	4.2-18.7 (11.4)	13.7-117.1 (42.4)	11.8-139 (40.0)
Total groups (no)	-	10-11 (11)	7-13 (10)	11-17 (14)
Macrobenthos				
Biomass (g/m ² , wet wt)	6.4	0.4	<0.2	<0.1
Population (no/m ²)	264	978	26	143
Total groups (no)	3	8	2	5

Table 3.3.6(Contd 6)

Parameter	Mundra				
	March 1997	March 1999	March 2000	April 2002	June 2003
Phytoplankton					
Chlorophyll a (mg/m ³)	0.3-1.1 (0.8)	0.5-2.7 (0.9)	0.5-1.6 (0.8)	0.5-1.6 (0.9)	0.2-4.1 (1.0)
Phaeophytin (mg/m ³)	0.2-0.8 (0.4)	0.1-1.7 (0.6)	0.1-0.6 (0.4)	0.1-1.3 (0.7)	0.1-1.6 (0.5)
Cell counts (nox10 ³ /l)	62.4-293.0 (189.4)	33.6-133.2 (79.6)	14.0-196.0 (57.0)	16.6-82.8 (45.8)	12.9-427 (90.8)
Total genera (no)	7-14 (12)	6-14 (10)	8-14 (11)	20-26 (24)	8-13 (10)
Zooplankton					
Biomass (ml/100m ³)	0.4-72.7 (32.0)	0.8-8.0 (4.3)	0.2-28.2 (6.4)	0.2-25.3 (9.1)	0.9-9.6 (2.7)
Population (nox10 ³ /100m ³)	1.6-144.1 (74.8)	2.1-40.4 (19.6)	1.9-145.1 (25.0)	2.2-156 (45.5)	7.7-58.9 (18.7)
Total groups (no)	9-16 (12)	6-16 (12)	6-17 (10)	9-21 (15)	12-18 (15)
Macrobenthos					
Biomass (g/m ² , wet wt)	4.4	0.2-2.0 (0.8)	0.1-43.1 (4.3)	12.8	0-4.5 (0.4)
Population (no/m ²)	5700	302-515 (380)	100-20600 (2100)	3494	0-1300 (240)
Total groups (no)	7	5-5 (5)	2-7 (4)	15	0-6 (3)

Average given in parenthesis

Table 3.3.7 : Biological characteristics of the Gulf during postmonsoon (1984-2004)

Parameter	Okha					
	December 1981	November 1995	November 1999	November 2002	January 2003	January 2004
Phytoplankton						
Chlorophyll a (mg/m ³)	2.7-4.3 (3.5)	1.1-1.1 (1.1)	1.1-1.1 (1.1)	0.5-1.6 (0.7)	0.5-0.5 (0.5)	0.2-0.4 (0.3)
Phaeophytin (mg/m ³)	-	0.2-0.6 (0.3)	0.1-0.4 (0.2)	0.1-1.4 (0.6)	0.2-1.0 (0.5)	0.1-0.3 (0.2)
Cell counts (no $\times 10^3$ /l)	-	27.0-54.8 (41.8)	68.0-80.0 (74.0)	-	1.2-54 (21.0)	3.1-60.0 (19.0)
Total genera (no)	-	13-16 (15)	10-11 (11)	-	9-19 (12)	10-17 (12)
Zooplankton						
Biomass (ml/100m ³)	0.5-0.9 (0.7)	0.4-0.8 (0.6)	0.4-1.0 (0.7)	0.2-2.6 (1.6)	2.2-8.2 (4.6)	1.0-56.9 (25.2)
Population (no $\times 10^3$ /100m ³)	-	0.5-0.5 (0.5)	6.9-7.2 (7.0)	0.6-22.8 (8.3)	26.1-86 (54.9)	20.5-69.4 (45.8)
Total groups (no)	-	7-14 (12)	10-11 (11)	10-19 (16)	15-21 (16)	12-20 (15)
Macrobenthos						
Biomass (g/m ² ; wet wt)	-	<0.1	0.5	1.89	0.5-24.9 (15.2)	0.2-5.2 (3.3)
Population (no/m ²)	775	89	352	1963	600-2025 (1307)	213-2900 (1597)
Total groups (no)	5	3	4	10	2-6 (5)	2-6 (4)

Table 3.3.7 (Contd 2)

Parameter	Vadinar						
	November 1994	November 1995	January 2000	November 2002	January 2003	January 2004	November 2004
Phytoplankton							
Chlorophyll a (mg/m ³)	0.5-0.5 (0.5)	0.5-1.1 (0.7)	0.5-1.1 (0.8)	0.5-1.6 (0.6)	0.5-0.5 (0.5)	0.2-0.2 (0.2)	0.2-0.2 (0.2)
Phaeophytin (mg/m ³)	0.2-1.0 (0.6)	0.1-0.6 (0.4)	0.1-0.6 (0.4)	0.1-1.3 (0.4)	0.2-1.0 (0.6)	0.1-0.2 (0.2)	0.2-1.0 (0.5)
Cell counts (no $\times 10^3$ /l)	-	9.4-32.7 (17.1)	17.2-28.8 (22.0)	3.8-26.4 (9.9)	9.6-70.0 (36.6)	2.0-20.1 (11.7)	2.0-36.0 (7.6)
Total genera (no)	-	10-12 (11)	8-13 (11)	10-18 (14)	9-21 (14)	11-18 (15)	7-18 (12)
Zooplankton							
Biomass (ml/100m ³)	2.1-6.4 (4.6)	1.6 (1.6)	0.6-7.3 (4.0)	0.4-2.5 (1.3)	4.2-11.9 (8.2)	0.1-1.9 (1.0)	0.3-6.7 (1.7)
Population (no $\times 10^3$ /100m ³)	3.7-52.7 (23.7)	7.2 (7.2)	8.7-41.1 (24.9)	2.5-12.2 (7.4)	23.4-125 (66.5)	0.2-9.6 (6.8)	1.4-37.1 (12.5)
Total groups (no)	11-15 (13)	10 (10)	7-8 (8)	9-20 (16)	20-23 (22)	8-12 (9)	11-17 (14)
Macrobenthos							
Biomass (g/m ² ; wet wt)	-	1.2	0.2	1.26	0.0-35.5 (10.0)	<0.1-7.2 (2.6)	2.0
Population (no/m ²)	-	339	126	1163	0-7425 (2581)	25-1826 (471)	570
Total groups (no)	-	3	3	9	0-9 (5)	2	5

Table 3.3.7 (Contd 3)

Parameter	Sikka			
	December 1993	December 2000	November 2002	November 2003
Phytoplankton				
Chlorophyll a (mg/m ³)	0.5-4.3 (1.8)	0.5-3.7 (1.3)	0.5-1.1 (0.6)	0.2-0.6 (0.3)
Phaeophytin (mg/m ³)	0.1-2.8 (0.9)	0.1-1.5 (0.6)	0.2-1.0 (0.4)	0.1-1.0 (0.6)
Cell counts (nox10 ³ /l)	4.0-252 (90.0)	8.0-267 (85.4)	-	3.6-59.2 (21.4)
Total genera (no)	4-12 (7)	8-13 (11)	-	7-10 (9)
Zooplankton				
Biomass (ml/100m ³)	3.9-29.9 (11.0)	5.0-32.4 (20.7)	0.5-5.7 (2.5)	2.4-11.4 (7.8)
Population (nox10 ³ /100m ³)	1.93-71.3 (44.5)	12.8-83.4 (43.3)	2.3-37.0 (13.5)	27.8-91 (67.5)
Total groups (no)	10-13 (12)	13-19 (16)	11-20 (16)	13-17 (15)
Macrobenthos				
Biomass (g/m ² ; wet wt)	12.8	0.02-2.1 (1.0)	14.4	2.2-3.7 (3.2)
Population (no/m ²)	10914	150-777 (483)	544	375-1250 (828)
Total groups (no)	11	2-9 (4)	8	3-8 (6)

Table 3.3.7 (Contd 4)

Parameter	Bedi		Navlakhi		
	October 1997	November 2002	November 1986	November 1994	November 2002
Phytoplankton					
Chlorophyll a (mg/m ³)	0.5-1.6 (1.0)	0.5-1.6 (1.0)	1.1-4.6 (2.2)	0.5-1.6 (0.9)	0.5-1.6 (0.6)
Phaeophytin (mg/m ³)	1.3-1.6 (1.4)	0.1-0.5 (0.4)	0.1-1.9 (1.0)	0.1-0.8 (0.4)	0.1-0.8 (0.4)
Cell counts (no $\times 10^3$ /l)	0.2-14.8 (7.5)	3.8-56.1 (22.5)	-	9.0-18.9 (13.1)	6.0-31.4 (14.5)
Total genera (no)	6-7 (7)	10-16 (13)	-	7-9 (8)	8-20 (13)
Zooplankton					
Biomass (ml/100m ³)	1.8-7.5 (4.6)	3.9-8.9 (6.6)	13.2-55.2 (30.4)	1.8-13.5 (5.6)	0.8-5.4 (3.5)
Population (no $\times 10^3$ /100m ³)	9.9-14.9 (12.4)	12.8-24.5 (19.4)	2.0-13.0 (6.8)	4.4-31.4 (14.5)	5.5-38.3 (15.1)
Total groups (no)	10-11 (11)	16-19 (17)	-	10-15 (12)	12-19 (16)
Macrobenthos					
Biomass (g/m ² ; wet wt)	0.1	5.7	0.1-43.1 (4.3)	0.1	<0.1-0.1
Population (no/m ²)	125	1125	100-20600 (2100)	60	13-125 (82)
Total groups (no)	1	12	2-7 (4)	15	0-6 (3)

Table 3.3.7 (Contd 5)

Parameter	Kandla					
	November 1986	October 1996	November 2002	January 2003	December 2004	January 2004
Phytoplankton						
Chlorophyll a (mg/m ³)	0.5-1.1 (0.8)	2.1-4.3 (3.2)	0.5-1.1 (0.8)	0.5-1.1 (0.9)	0.2-0.2 (0.2)	0.2-0.2 (0.2)
Phaeophytin (mg/m ³)	1.0-1.3 (0.6)	0.1-0.6 (0.8)	0.2-1.9 (0.6)	1.2-2.3 (1.6)	0.2-1.0 (0.6)	0.1-0.5 (0.3)
Cell counts (no $\times 10^3$ /l)	-	25.2-37.5 (30.4)	3.6-28.1 (17.6)	37.4-138.4 (103.0)	0.8-45.2 (31.8)	3-11.2 (6.0)
Total genera (no)	-	5-9 (7)	5-14 (10)	9-11 (10)	2-14 (7)	8-12 (11)
Zooplankton						
Biomass (ml/100m ³)	8.2-13.7 (11.8)	1.8-5.2 (3.5)	3.1-9.9 (5.2)	3.3-6.1 (4.7)	2.1-8.8 (5.9)	1.2-1.7 (1.5)
Population (no $\times 10^3$ /100m ³)	21.0-32.9 (25.5)	1.2-63.6 (32.4)	16.6-102.1 (40.7)	61.0-63.7 (62.4)	4.5-89.0 (42.6)	4.1-6.7 (5.4)
Total groups (no)	-	8-12 (10)	12-21 (18)	17-17 (17)	14-19 (17)	9-10 (10)
Macrobenthos						
Biomass (g/m ² , wet wt)	0.2	0.4	0.1	0.1	1.2	0.1-1.1 (0.6)
Population (no/m ²)	60	276	6.9	75	177	100-138 (119)
Total groups (no)	2	3	4	2	2	3-5 (4)

Table 3.3.7 (Contd 6)

Parameter	Mundra				
	September 1999	November 2002	January 2003	October 2003	January 2004
Phytoplankton					
Chlorophyll a (mg/m ³)	1.1-3.7 (2.6)	0.5-1.1 (0.5)	0.5-1.6 (1.0)	0.2-3.4 (1.0)	0.2-0.2 (0.2)
Phaeophytin (mg/m ³)	0.4-2.8 (1.3)	0.2-0.6 (0.3)	0.1-4.2 (1.8)	0.1-1.5 (0.4)	0.1-0.8 (0.3)
Cell counts (nox10 ³ /l)	96.0-169.0 (150.0)	4.2-24.1 (11.2)	13-148 (53.8)	26-337 (111)	3.7-34.0 (14.6)
Total genera (no)	6-12 (9)	7-17 (11)	12-18 (15)	9-22 (15)	12-18 (14)
Zooplankton					
Biomass (ml/100m ³)	0.1-2.5 (0.8)	4.5-15.4 (7.2)	4.0-6.8 (5.7)	1.1-21.8 (5.2)	0.8-3.0 (1.8)
Population (nox10 ³ /100m ³)	0.1-11.0 (2.7)	7.5-60.6 (29.3)	58.2-150.3 (84.3)	11.7-81.5 (38.1)	6.3-22.0 (13.6)
Total groups (no)	9-19 (12)	13-19 (15)	16-17 (17)	12-17 (15)	8-14 (10)
Macrobenthos					
Biomass (g/m ² , wet wt)	0.6	0.3	0.1-15.5 (4.6)	1.4	1.4-2.7 (2.0)
Population (no/m ²)	713	325	125-1425 652	350	550-1450 (75)
Total groups (no)	2	8	2-6 (4)	2	4-6 (5)

Average given in parenthesis.

Table 3.3.8 : Mangrove areas and status of occurrence of major species of Gujarat

District	1992	1998
Mangroves areas (km²)		
Kachchh	601.8	938.0
Jamnagar	13.12	98.3
Junagad	0.8	0.3
Bhavnagar	14.5	6.2
Bharuch	10.9	17.1
Surat	7.8	5.0
Valsad	-	5.0
Total	767.0	1066.9
Status of occurrence of major species		
Species	1950	1998
<i>Avicennia</i> sp	Common	Common
<i>Rhizosolenia</i>	Common	Vulnerable
<i>Aegiceras</i> sp	Common	Endangered
<i>Ceriops tagal</i>	Common	Vulnerable
<i>Sonneratia apetala</i>	Common	Vulnerable
<i>Bruigera</i> sp.	Common	Absent
* Based on satellite data		

Table 3.3.9: Distribution of corals in the Gulf

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<i>Esammocora digitata</i>	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
<i>Acropora humilis</i>	-	-	+	+	-	-	+	+	-	-	-	-	-	-	-
<i>A.squamosa</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
<i>Montipora explanata</i>	+	-	+	+	-	+	+	-	+	+	+	+	+	+	+
<i>M.venosa</i>	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
<i>M.turgescons</i>	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
<i>M.hispida</i>	+	+	-	+	+	-	+	+	+	+	+	-	-	-	+
<i>M.foliosa</i>	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
<i>M.monasteriata</i>	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
<i>Coscinaraea monile</i>	+	+	+	+	+	+	+	+	+	-	-	-	-	-	+
<i>Siderastrea savignyana</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pseudosiderastrea tayami</i>	+	-	-	-	-	-	+	+	+	+	+	+	+	+	+
<i>Goniopora planulata</i>	+	+	-	-	+	+	+	-	+	+	-	+	-	-	+
<i>G.minor</i>	-	-	-	+	-	-	+	-	-	-	-	-	-	-	+
<i>G.nigra</i>	+	+	-	+	+	+	+	-	-	+	-	-	-	-	+
<i>Porites leutea</i>	+	+	+	+	-	-	+	-	-	-	-	+	-	-	+
<i>P.lichen</i>	+	-	-	-	-	-	+	-	+	-	-	+	-	+	+
<i>P.compressa</i>	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>Favia speciosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>F.favus</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Favites complanata</i>	+	+	+	+	+	+	+	-	-	+	-	-	-	+	+

Table 3.3.9 (Contd 2)

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<i>F.melicerus</i>	+	-	+	-	-	-	-	-	+	-	-	-	-	+	+
<i>Goniastrea pectinata</i>	+	+	+	+	+	+	+	-	+	+	+	-	+	+	+
<i>Platygyra sinensis</i>	+	+	+	+	-	-	-	-	-	+	-	-	-	+	+
<i>Hydnophora exesa</i>	+	+	+	+	-	-	-	-	-	+	-	-	+	-	+
<i>Plesiastrea versipora</i>	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-
<i>Leptastrea purpurea</i>	-	-	-	-	-	-	-	-	-	-	-	Sikka point			
<i>Cyphastrea serailia</i>	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+
<i>Symphyllia radian</i>	-	+	-	+	-	+	-	-	+	-	-	-	-	-	-
<i>Acanthastrea simplex</i>	+	+	+	+	-	-	-	-	+	+	-	-	-	-	+
<i>Mycedium elephantotus</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
<i>Paracyathus stokesi</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	10 m	
<i>Polycyathus verrilli</i>	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-
<i>Tubastraea aurea</i>	+	+	+	+	+	-	-	-	+	+	-	-	-	-	-
<i>Turbinaria crater</i>	+	+	-	+	-	-	+	-	-	-	-	-	-	-	+
<i>T.peltata</i>	-	+	+	+	+	+	+	-	-	+	-	-	+	+	+

1 : Okha

2 : Dholio Gugar

3 : Dona

4 : Boria

5 : Mangunda

6 : Savaj

7 : Paga

8 : Manmarudi Langamarudi

9 : Ajad

10: Bural reef

11 : Dhani

12 : Kalumbhar reef

13: Narara reef

14 : Goose reef

15 : Pirotan island

Source: Pillai, C.S.G. and M.I. Patel (1988)

Table 3.3.10 : List of waterbirds in the Gulf.

English name	Scientific name	Status in habitat	
		Salt pans	Gulf
Podicipedidae			
Great Crested Grebe	<i>Podiceps cristatus</i>	LM	-
Blacknecked Grebe	<i>Podiceps nigricollis</i>	M	-
Pelecanidae			
White Pelican	<i>Pelecanus onocrotalus</i>	LM	LM
Dalmatian Pelican	<i>Pelecanus crispus</i>	M	M
Phalacrocoracidae			
Cormorant	<i>Phalacrocorax carbo</i>	LM	LM
Indian Shag	<i>Phalacrocorax fuscicollis</i>	LM	LM
Little Cormorant	<i>Phalacrocorax niger</i>	LM	R
Darter	<i>Anhinga rufa</i>	LM	R
Ardeidae			
Grey Heron	<i>Ardea cinerea</i>	LM	R
Purple Heron	<i>Ardea purpurea</i>	LM	-
Little Green Heron	<i>Ardeola striatus</i>	LM	R
Pond Heron	<i>Ardeola grayii</i>	LM	R
Cattle Egret	<i>Bubulcus ibis</i>	-	LM
Large Egret	<i>Ardea alba</i>	LM	R
Smaller Egret	<i>Egretta intermedia</i>	LM	-
Little Egret	<i>Egretta garzetta</i>	LM	-
Indian Reef Heron	<i>Egretta gularis</i>	LM	R
Night Heron	<i>Nycticorax nycticorax</i>	LM	R
Ciconiidae			
Painted Stork	<i>Mycteria leucocephala</i>	LM	R
Blacknecked Stork	<i>Ephippiorhynchus asiaticus</i>	LM	LM
Threskiornithidae			
White Ibis	<i>Threskiornis aethiopica</i>	LM	R
Black Ibis	<i>Pseudibis papillasa</i>	-	R
Spoonbill	<i>Platalea leucorodia</i>	LM	R

Table 3.3.10 (Contd 2)

English name	Scientific name	Status in habitat	
		Salt pans	Gulf
Phoenicopteridae			
Flamingo	<i>Phoenicopterus roseus</i>	LM	LM
Lesser Flamingo	<i>Phoeniconatass minor</i>	LM	R
Anatidae			
Ruddy Shelduck	<i>Tadorna ferruginea</i>	-	M
Pintail	<i>Anas acuta</i>	M	M
Common Teal	<i>Anas crecca</i>	M	-
Spotbill Duck	<i>Anas poecilorhyncha</i>	LM	LM
Shoveller	<i>Anas clypeata</i>	M	-
Accipitridae			
Brahminy Kite	<i>Haliastur indus</i>	LM	R
Marsh Harrier	<i>Circus aeruginosus</i>	M	M
Osprey	<i>Pandion haliaetus</i>	M	M
Gruidae			
Common Crane	<i>Grus grus</i>	M	M
Demoiselle Crane	<i>Anthropoides virgo</i>	M	M
Rallidae			
Coot	<i>Fulica atra</i>	LM	LM
Jacanidae			
Pheasant - tailed Jacana	<i>Hydrophasianus chirurgus</i>	LM	-
Haematopodidae			
Oystercatcher	<i>Haematopus ostralegus</i>	M	M
Charadriidae			
Redwattled Lapwing	<i>Vanellus indicus</i>	R	R
Grey Plover	<i>Pluvialis sugotarola</i>	M	M
Eastern Golden Plover	<i>Pluvialis dominica</i>	-	M

Table 3.3.10 (Contd 3)

English name	Scientific name	Status in habitat	
		Salt pans	Gulf
Large Sand Plover	<i>Charadrius leschenaultii</i>	M	M
Ringed Plover	<i>Charadrius hiaticula</i>	R	-
Kentish plover	<i>Charadrius alexandrinus</i>	R	R
Lesser Sand Plover	<i>Charadrius mongolus</i>	M	M
Whimbrel	<i>Numenius phaeopus</i>	M	M
Curlew	<i>Numenius arquata</i>	M	M
Blacktailed Godwit	<i>Limosa limosa</i>	M	-
Bartailed Godwit	<i>Limosa lapponica</i>	M	M
Spotted Redshank	<i>Tringa erythropus</i>	M	M
Common Redshank	<i>Tringa totanus</i>	M	M
Marsh Sandpiper	<i>Tringa stagnatilis</i>	M	M
Greenshank	<i>Tringa nebularia</i>	M	M
Green Sandpiper	<i>Tringa ochropus</i>	M	M
Wood Sandpiper	<i>Tringa glareola</i>	M	-
Terek Sandpiper	<i>Tringa terek</i>	M	M
Common Sandpiper	<i>Tringa hypoleucos</i>	M	M
Turnstone	<i>Arenaria interpres</i>	M	M
Knot	<i>Calidris carutus</i>	-	M
Eastern Knot	<i>Calidris tenuirostris</i>	-	V
Sanderling	<i>Calidris alba</i>	-	M
Eastern Little Stint	<i>Calidris ruficollis</i>	-	V
Little Stint	<i>Calidris minuta</i>	M	M
Dunlin	<i>Calidris alpina</i>	M	M
Curlew-Sandpiper	<i>Calidris testacea</i>	M	M
Broadbilled Sandpiper	<i>Limicola falcinellus</i>	M	M
Ruff and Reeve	<i>Philomachus pugnax</i>	M	M
Rednecked Phalarope	<i>Phalaropus lobatus</i>	M	M
Recurvirostidae			
Blackwinged Stilt	<i>Himantopus himantopus</i>	R	-
Avocet	<i>Recurvirostra avosetta</i>	LM	-

Table 3.3.10 (Contd 4)

English name	Scientific name	Status in habitat	
		Salt pans	Gulf
Dromadidae			
Crab Plover	<i>Dromas ardeola</i>	M	M
Burhinidae			
Great Stone Plover	<i>Esacus magnirostris</i>	LM	R
Laridae			
Herring Gull	<i>Larus argentatus</i>	M	M
Lesser Blackbacked			
Gull	<i>Larus fuscus</i>	M	M
Blackheaded	<i>Larus ichthyaetus</i>	M	M
Brownheaded Gull	<i>Larus brunnicephalus</i>	M	M
Blackheaded Gull	<i>Larus ridibunds</i>	M	M
Slenderbilled Gull	<i>Larus genei</i>	M	M
Whiskered Tern	<i>Chilidonias hybrida</i>	M	M
Whitewinged Black	<i>Chilidonias leucopterus</i>	M	M
Tern			
Gullbilled Tern	<i>Gelochelidon nilotica</i>	M	M
Caspian Tern	<i>Hdroprogne caspia</i>	LM	LM
Common Tern	<i>Sterna hirunda</i>	M	M
Whitecheeked Tern	<i>Sterna repressa</i>	M	M
Brownwinged Tern	<i>Sterna anaethetus</i>	M	M
Little Tern	<i>Sterna albitrons</i>	M	M
Saunders Little Tern	<i>Sterna saundersi</i>	LM	R
Large Crested Tern	<i>Sterna bergii</i>	M	M
Indian Lesser Crested Tern	<i>Sterna bengalenis</i>	M	M
Sandwich Tern	<i>Sterna sandvicensis</i>	M	M
Indian skimmer	<i>Rynchops albicollis</i>	LM	LM

Table 3.3.10 (Contd 5)

English name	Scientific name	Status in habitat	
		Salt pans	Gulf
Alcedinidae			
Common Kingfisher	<i>Alcedo atthis</i>	LM	LM
Whitebreast	<i>Halcyon smyrnensisq</i>	LM	LM
Blackcapped kingfisher	<i>Halcyon pileata</i>	M	M

- R : Resident, has been recorded breeding during the study.
- LM : Local migrant, has not been recorded breeding during the study, but is known to nest within the state.
- M : Migrant, does not breed in this area, spends the winter here and also sometimes the summer.
- V : Not normally found in the area, one to few records only.

Source : Saurashtra University (1991).

Table 4.3.1 Water quality at station 1 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	19.0	20.0	19.0	28.9	29.0	29.0
	B	19.0	20.0	19.0	28.5	28.5	28.5
		20.5	20.5	20.5	(28.8)	(28.8)	(28.8)
PH	S	8.1	8.1	8.1	8.0	8.0	8.0
	B	8.1	8.1	8.1	8.0	8.0	8.0
SS (mg/l)	S	-	-	-	-	-	28*
	B	-	-	-	-	-	28*
Salinity (ppt)	S	37.2	37.2	37.2	37.2	37.4	37.3
	B	37.2	37.2	37.2	37.0	37.2	37.1
DO (ml/l)	S	4.9	5.1	4.9	4.5	4.8	4.6
	B	4.9	5.1	4.9	4.8	5.0	4.9
BOD (mg/l)	S	1.4	1.7	1.4	-	-	4.2*
	B	1.4	1.4	1.4	-	-	1.6*
PO ₄ ³⁻ -P (µmol/l)	S	1.0	1.6	1.0	0.6	0.7	0.7
	B	1.3	1.6	1.3	1.0	1.0	1.0
PTotal (µmol/l)	S	-	-	-	-	-	-
	B	-	-	-	-	-	-
NO ₃ ⁻ -N (µmol/l)	S	5.1	6.7	5.1	2.4	3.5	3.0
	B	5.1	6.7	5.1	2.0	2.9	2.5
NO ₂ ⁻ -N (µmol/l)	S	0.4	0.5	0.4	0.3	0.3	0.3
	B	0.4	0.5	0.4	0.3	0.3	0.3
NH ₄ ⁺ -N (µmol/l)	S	0.1	0.4	0.1	0.7	1.2	0.9
	B	0.2	0.4	0.2	0.7	0.8	0.8
NTotal (µmol/l)	S	-	-	-	-	-	-
	B	-	-	-	-	-	-
PHc (µg/l)	1m	-	-	-	-	-	26.5*
Phenols (µg/l)	S	*	-	*	-	-	26.6*

Air temperature (°C) given in parenthesis *Single value

Table 4.3.2: Water quality at station 2 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Min	Avg	Min	Min	Avg
Temperature (°C)	S	21.0	22.0	21.5	28.0	28.1	28.1
	B	21.0	22.0	21.3	29.75	27.5	27.5
		23.0	23.0	23.0	(29.5)	(29.5)	(29.5)
PH	S	8.1	8.1	8.1	7.9	7.9	7.9
	B	8.1	8.1	8.1	8.0	8.0	8.0
SS (mg/l)	S	-	-	58*	-	-	26*
	B	-	-	60*	-	-	22*
Salinity (ppt)	S	37.0	37.2	37.1	36.6	36.8	36.7
	B	37.0	37.2	37.0	36.8	36.8	36.8
DO (ml/l)	S	4.9	5.1	5.0	4.8	5.0	4.9
	B	5.1	5.1	5.1	4.8	5.0	4.9
BOD (mg/l)	S	1.1	1.4	1.2	-	-	4.5*
	B	1.4	1.4	1.4	-	-	1.6*
PO ₄ ³⁻ -P (μmol/l)	S	1.2	1.8	1.5	0.4	0.6	0.5
	B	1.5	1.8	1.7	1.2	1.2	1.2
PTotal (μmol/l)	S	-	-	2.2*	-	-	-
	B	-	-	2.3*	-	-	-
NO ₃ ⁻ -N (μmol/l)	S	8.5	9.2	8.7	5.1	7.2	6.2
	B	8.5	8.7	8.6	5.0	6.0	5.5
NO ₂ ⁻ -N (μmol/l)	S	0.3	0.3	0.3	0.4	0.5	0.5
	B	0.3	0.3	0.3	0.4	0.4	0.4
NH ₄ ⁺ -N (μmol/l)	S	ND	0.2	0.1	0.7	0.9	0.8
	B	ND	0.1	0.1	0.6	0.6	0.6
NTotal (μmol/l)	S	-	-	33.9*	-	-	-
	B	-	-	21.3*	-	-	-
PHc (μg/l)	1m	-	-	17.2*	-	-	17.2*
Phenols (μg/l)	S	-	-	3.1*	-	-	64.1*

Air temperature (°C) given in parenthesis *Single value

Table 4.3.3: Water quality at station 3 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Min	Avg	Min	Min	Avg
Temperature (°C)	S	21.5	22.0	21.8	27.7	27.8	27.8
	B	21.5	22.0	21.7	27.5	27.6	27.6
		24.0	24.0	24.0	(28.8)	(28.8)	(28.8)
PH	S	8.1	8.1	8.1	8.0	8.0	8.0
	B	8.1	8.1	8.1	8.0	8.0	8.0
SS (mg/l)	S	-	-	56*	-	-	28*
	B	-	-	70*	-	-	16*
Salinity (ppt)	S	37.0	37.2	37.0	36.5	36.5	36.5
	B	37.0	37.2	37.0	36.6	36.6	36.6
DO (ml/l)	S	4.9	5.1	5.0	4.8	5.0	4.9
	B	4.9	5.1	5.0	4.8	5.0	4.9
BOD (mg/l)	S	0.5	0.8	0.6	-	-	3.6*
	B	0.5	0.5	0.5	-	-	-
PO ₄ ³⁻ -P (μmol/l)	S	1.6	1.8	1.7	0.8	0.8	0.8
	B	1.6	1.7	1.6	1.1	1.1	1.1
PTotal (μmol/l)	S	-	-	2.3*	-	-	-
	B	-	-	2.2*	-	-	-
NO ₃ ⁻ -N (μmol/l)	S	8.0	9.1	8.6	5.0	5.3	5.1
	B	8.0	8.7	8.5	4.4	5.5	5.0
NO ₂ ⁻ -N (μmol/l)	S	0.3	0.3	0.3	0.4	0.4	0.4
	B	0.3	0.3	0.3	0.3	0.4	0.4
NH ₄ ⁺ -N (μmol/l)	S	ND	0.3	0.2	0.6	1.5	1.1
	B	ND	0.3	0.2	0.6	0.7	0.7
NTotal (μmol/l)	S	-	-	52.8*	-	-	-
	B	-	-	64.6*	-	-	-
PHc (μg/l)	1m	-	-	13.2*	-	-	28.1*
Phenols (μg/l)	S	-	-	6.2*	-	-	30.2

Air temperature (°C) given in parenthesis *Single value

Table 4.3.4: Water quality at station 4 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Min	Avg	Min	Min	Avg
Temperature (°C)	S	19.0	20.5	19.9	26.7	27.7	26.9
	B	19.0	20.5	19.8	26.7	29.0	27.3
		22.0	26.0	24.0	(28.6)	(29.0)	(28.8)
PH	S	8.1	8.3	8.1	7.9	8.0	8.0
	B	8.1	8.2	8.1	8.0	8.0	8.0
SS (mg/l)	S	36	38	37	42	56	49
	B	40	40	40	32	46	39
Salinity (ppt)	S	37.1	37.7	37.4	36.4	37.7	36.8
	B	37.1	37.7	37.4	35.4	37.2	36.4
DO (ml/l)	S	4.7	5.6	5.3	4.5	5.0	4.6
	B	4.7	5.6	5.3	4.5	5.0	4.6
BOD (mg/l)	S	1.2	1.5	1.4	2.3	3.9	3.1
	B	1.2	1.5	1.4	0.6	1.0	0.8
PO ₄ ³⁻ -P (μmol/l)	S	1.2	2.3	1.9	0.4	1.5	0.8
	B	1.2	2.3	1.9	1.0	1.4	1.2
PTotal (μmol/l)	S	1.9	2.0	2.0	-	-	-
	B	2.2	2.2	2.2	-	-	-
NO ₃ ⁻ -N (μmol/l)	S	6.2	12.6	8.9	4.7	6.8	5.4
	B	6.2	12.6	9.1	2.5	5.7	4.8
NO ₂ ⁻ -N (μmol/l)	S	0.3	0.5	0.4	0.3	0.5	0.4
	B	0.3	0.5	0.4	0.3	0.5	0.4
NH ₄ ⁺ -N (μmol/l)	S	0.1	0.9	0.5	0.2	0.4	0.3
	B	0.1	0.9	0.4	0.3	0.5	0.4
NTotal (μmol/l)	S	72.0	75.9	74.0	-	-	-
	B	53.3	63.5	58.4	-	-	-
PHc (μg/l)	1m	19.2	19.6	19.4	9.2	10.4	9.8
Phenols (μg/l)	S	0.7	49.7	25.2	24.5	42.2	33.4

Air temperature (°C) given in parenthesis *Single value

Table 4.3.5: Water quality at station 5 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	20.0	22.9	21.2	25.9	26.5	26.2
	B	20.0	22.9	21.2	25.7	27.1	26.2
		18.2	26.2	23.4	(26.5)	(29.0)	(27.9)
PH	S	8.1	8.2	8.2	7.8	7.9	7.9
	B	8.1	8.2	8.2	7.9	7.9	7.9
SS (mg/l)	S	30	36	33	24	26	25
	B	30	34	32	24	26	25
Salinity (ppt)	S	37.1	37.9	37.3	36.6	37.7	37.0
	B	37.1	37.5	37.3	34.6	37.7	36.7
DO (ml/l)	S	2.0	5.4	5.1	4.5	5.2	4.7
	B	2.0	5.4	5.1	4.3	5.0	4.8
BOD (mg/l)	S	2.1	4.0	3.2	1.9	2.3	2.1
	B	2.1	4.0	3.2	0.6	1.3	1.0
PO ₄ ³⁻ -P (µmol/l)	S	0.7	1.8	1.5	0.2	1.5	0.6
	B	0.7	1.8	1.5	1.1	1.3	1.2
PTotal (µmol/l)	S	2.2	2.3	2.3	-	-	-
	B	1.9	2.2	2.1	-	-	-
NO ₃ ⁻ -N (µmol/l)	S	6.6	10.4	8.4	0.4	4.8	3.0
	B	6.6	10.4	8.5	2.9	4.0	3.2
NO ₂ ⁻ -N (µmol/l)	S	0.3	0.4	0.4	0.3	0.7	0.4
	B	0.3	0.4	0.4	0.3	0.6	0.5
NH ₄ ⁺ -N (µmol/l)	S	0.2	1.2	0.5	0.4	0.9	0.6
	B	0.2	1.2	0.5	0.1	1.1	0.6
NTotal (µmol/l)	S	72.4	76.3	74.4	-	-	-
	B	61.1	150	105.6	-	-	-
PHc (µg/l)	1m	2.4	11.3	6.9	17.6	45.7	31.7
Phenols (µg/l)	S	18.0	61.9	40.0	4.6	21.6	13.1

Air temperature (°C) given in parenthesis *Single value

Table 4.3.6: Water quality at station 6 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	20.8	23.2	22.3	25.8	26.4	26.1
	B	20.8	23.0	22.2	25.6	26.4	25.9
		22.8	25.0	24.2	(26.0)	(27.8)	(27.3)
PH	S	8.0	8.2	8.1	8.0	8.0	8.0
	B	8.1	8.2	8.2	8.0	8.0	8.0
SS (mg/l)	S	58	82	70	30	36	33
	B	64	214	139	30	32	31
Salinity (ppt)	S	36.5	37.2	36.9	36.7	37.3	37.0
	B	36.5	37.2	36.9	36.7	37.3	36.9
DO (ml/l)	S	4.0	5.4	4.9	4.5	4.8	4.6
	B	4.0	5.4	4.8	4.1	4.8	4.6
BOD (mg/l)	S	ND	4.3	1.7	2.3	2.6	2.4
	B	ND	2.1	0.8	1.9	3.6	2.7
PO ₄ ³⁻ -P (μmol/l)	S	0.4	1.9	1.5	0.8	1.4	1.1
	B	0.8	1.9	1.6	1.2	2.0	1.5
PTotal (μmol/l)	S	1.9	2.1	2.0	-	-	-
	B	1.8	2.1	2.0	-	-	-
NO ₃ ⁻ -N (μmol/l)	S	4.7	7.6	6.6	2.4	4.7	3.4
	B	4.7	7.6	6.5	2.3	4.0	3.2
NO ₂ ⁻ -N (μmol/l)	S	0.2	0.4	0.3	0.3	0.6	0.4
	B	0.2	0.4	0.3	0.4	0.5	0.5
NH ₄ ⁺ -N (μmol/l)	S	0.6	6.1	1.3	0.2	0.8	0.4
	B	0.6	6.1	1.2	0.3	1.0	0.6
NTotal (μmol/l)	S	53.5	86.7	70.1	-	-	-
	B	52.0	61.3	56.7	-	-	-
PHc (μg/l)	1m	13.7	21.7	17.7	10.6	24.9	17.8
Phenols (μg/l)	S	9.4	49.0	29.2	12.0	41.0	26.5

Air temperature (°C) given in parenthesis *Single value

Table 4.3.7: Water quality at station 7 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	18.0	18.5	18.3	25.0	27.6	26.4
	B	18.0	18.5	18.2	27.0	27.4	27.2
		17.5	18.0	17.8	(25.0)	(30.8)	(28.1)
PH	S	8.1	8.1	8.1	7.9	8.0	8.0
	B	8.1	8.1	8.1	8.0	8.0	8.0
SS (mg/l)	S	-	-	34*	26	44	34
	B	-	-	32*	24	32	28
Salinity (ppt)	S	37.3	37.7	37.5	37.3	40.0	38.5
	B	37.3	37.7	37.5	37.1	37.5	37.3
DO (ml/l)	S	5.3	5.5	5.4	4.1	4.8	4.4
	B	5.3	5.5	5.5	4.5	4.5	4.5
BOD (mg/l)	S	1.1	1.1	1.1	0.6	3.6	0.6
	B	1.1	1.1	1.1	-	-	0.6
PO ₄ ³⁻ -P (µmol/l)	S	1.7	1.7	1.7	1.0	3.1	1.6
	B	1.7	1.7	1.7	1.9	2.1	2.0
PTotal (µmol/l)	S	-	-	2.2*	-	-	-
	B	-	-	2.0*	-	-	-
NO ₃ ⁻ -N (µmol/l)	S	6.5	7.6	7.0	ND	3.8	1.4
	B	6.6	7.6	7.2	1.7	1.8	1.7
NO ₂ ⁻ -N (µmol/l)	S	0.4	0.6	0.5	0.4	0.8	0.6
	B	0.5	0.6	0.5	0.7	0.8	0.8
NH ₄ ⁺ -N (µmol/l)	S	0.3	0.8	0.6	0.4	1.0	0.6
	B	0.3	0.8	0.5	0.7	0.9	0.8
NTotal (µmol/l)	S	-	-	87.2*	-	-	-
	B	-	-	64.6*	-	-	-
PHc (µg/l)	1m	-	-	26.1*	14.9	17.7	16.3
Phenols (µg/l)	S	-	-	63.8*	21.8	32.2	26.9

Air temperature (°C) given in parenthesis *Single value

Table 4.3.8: Water quality at station 8 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	20.0	21.3	20.7	28.1	28.2	28.2
	B	20.0	21.3	20.4	27.6	27.6	27.6
		22.0	22.0	22.0	(29.0)	(29.0)	(29.0)
PH	S	8.0	8.1	8.1	7.9	8.0	8.0
	B	8.0	8.1	8.1	8.0	8.0	8.0
SS (mg/l)	S	-	-	64*	-	-	30*
	B	-	-	68*	-	-	26*
Salinity (ppt)	S	37.4	37.8	37.6	36.6	37.2	36.9
	B	37.4	37.8	37.6	36.5	36.8	36.6
DO (ml/l)	S	1.8	2.4	2.1	4.8	5.0	4.9
	B	1.8	2.4	2.1	4.8	4.8	4.8
BOD (mg/l)	S	-	-	-	-	-	3.6*
	B	-	-	-	-	-	1.6*
PO ₄ ³⁻ -P (µmol/l)	S	1.6	1.8	1.7	0.9	1.0	1.0
	B	1.7	1.8	1.8	1.3	1.4	1.4
PTotal (µmol/l)	S	-	-	2.2*	-	-	-
	B	-	-	2.4*	-	-	-
NO ₃ ⁻ -N (µmol/l)	S	5.7	5.9	5.9	6.3	8.2	7.2
	B	5.7	5.9	5.8	5.0	6.9	6.0
NO ₂ ⁻ -N (µmol/l)	S	0.4	0.5	0.5	0.4	0.5	0.5
	B	0.5	0.5	0.5	0.4	0.4	0.4
NH ₄ ⁺ -N (µmol/l)	S	0.1	0.4	0.2	0.9	1.0	1.0
	B	0.1	0.2	0.1	0.6	1.0	0.8
NTotal (µmol/l)	S	-	-	67.2*	-	-	-
	B	-	-	47.2*	-	-	-
PHc (µg/l)	1m	-	-	22.6*	-	-	18.1*
Phenols (µg/l)	S	-	-	9.1*	-	-	23.0*

Air temperature (°C) given in parenthesis *Single value

Table 4.3.9: Water quality at station 9 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	19.9	20.1	20.0	26.8	26.9	26.9
	B	19.9	20.1	20.0	27.0	27.0	27.0
		20.5	20.5	20.5	(28.5)	(28.5)	(28.5)
PH	S	8.0	8.1	8.1	7.9	7.9	7.9
	B	8.0	8.1	8.1	8.0	8.0	8.0
SS (mg/l)	S	-	-	44*	-	-	20*
	B	-	-	48*	-	-	18*
Salinity (ppt)	S	37.0	37.2	37.0	36.8	37.0	36.9
	B	37.0	37.2	37.0	37.0	37.2	37.1
DO (ml/l)	S	2.0	3.1	2.8	4.8	4.8	4.8
	B	2.0	3.1	2.7	4.3	4.8	4.6
BOD (mg/l)	S	-	-	-	-	-	5.2*
	B	-	-	-	-	-	-
PO ₄ ³⁻ -P (μmol/l)	S	1.5	1.6	1.6	0.4	0.5	0.5
	B	1.5	1.6	1.6	1.2	1.3	1.2
PTotal (μmol/l)	S	-	-	2.3*	-	-	-
	B	-	-	2.1*	-	-	-
NO ₃ ⁻ -N (μmol/l)	S	5.9	7.2	6.3	2.6	3.8	3.2
	B	5.9	6.3	6.0	4.6	4.6	4.6
NO ₂ ⁻ -N (μmol/l)	S	0.2	0.3	0.3	0.2	0.3	0.3
	B	0.2	0.3	0.3	0.4	0.4	0.4
NH ₄ ⁺ -N (μmol/l)	S	0.2	0.3	0.3	1.1	1.3	1.2
	B	0.2	0.3	0.3	0.5	0.7	0.6
NTotal (μmol/l)	S	-	-	75.0*	-	-	-
	B	-	-	44.3*	-	-	-
PHc (μg/l)	1m	-	-	11.7*	-	-	13.2*
Phenols (μg/l)	S	-	-	31.7*	-	-	9.8*

Air temperature (°C) given in parenthesis *Single value

Table 4.3.10: Water quality at station 10 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	22.0	22.5	22.3	27.5	27.5	27.5
	B	22.0	22.5	22.2	27.5	27.5	27.5
		23.8	23.8	23.8	(28.5)	(28.5)	(28.5)
PH	S	8.2	8.2	8.2	8.0	8.0	8.0
	B	8.2	8.2	8.2	8.0	8.0	8.0
SS (mg/l)	S	-	-	30*	-	-	44*
	B	-	-	62*	-	-	44*
Salinity (ppt)	S	36.5	36.9	36.7	37.4	38.4	37.7
	B	36.5	36.7	36.6	37.2	37.2	37.2
DO (ml/l)	S	4.7	5.5	5.1	4.5	4.8	4.6
	B	5.1	5.5	5.2	4.9	4.8	4.8
BOD (mg/l)	S	-	-	-	-	-	2.9*
	B	-	-	-	-	-	0.6*
PO ₄ ³⁻ -P (μmol/l)	S	0.3	2.2	1.4	0.5	1.0	0.8
	B	1.2	2.2	1.7	1.5	1.6	1.6
PTotal (μmol/l)	S	-	-	2.2*	-	-	-
	B	-	-	2.5*	-	-	-
NO ₃ ⁻ -N (μmol/l)	S	6.1	11.0	8.2	3.1	3.8	3.4
	B	6.5	11.0	8.9	2.3	3.2	2.8
NO ₂ ⁻ -N (μmol/l)	S	0.3	0.6	0.4	0.5	0.5	0.5
	B	0.3	0.6	0.4	0.5	0.6	0.6
NH ₄ ⁺ -N (μmol/l)	S	ND	0.7	0.2	0.4	0.4	0.4
	B	ND	0.1	0.1	0.5	0.6	0.6
NTotal (μmol/l)	S	-	-	17.2*	-	-	-
	B	-	-	22.4*	-	-	-
PHc (μg/l)	1m	-	-	11.1*	-	-	13.8*
Phenols (μg/l)	S	-	-	33.6*	-	-	26.2*

Air temperature (°C) given in parenthesis *Single value

Table 4.3.11: Water quality at station 11 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	22.0	22.8	22.4	27.0	27.0	27.0
	B	22.0	22.8	22.3	26.0	26.0	26.0
		24.8	24.8	24.8	(28.1)	(28.1)	(28.1)
PH	S	8.1	8.2	8.2	8.0	8.0	8.0
	B	8.1	8.2	8.2	8.0	8.0	8.0
SS (mg/l)	S	-	-	40*	-	-	126*
	B	-	-	36*	-	-	120*
Salinity (ppt)	S	36.7	38.8	37.3	37.2	37.2	37.2
	B	36.7	38.8	37.5	37.0	37.0	37.0
DO (ml/l)	S	5.0	5.7	5.3	4.5	4.5	4.5
	B	5.0	5.7	5.3	4.5	4.7	4.6
BOD (mg/l)	S	-	-	-	-	-	2.3*
	B	-	-	-	-	-	1.0*
PO ₄ ³⁻ -P (µmol/l)	S	0.6	1.7	1.2	1.2	1.4	1.3
	B	0.6	1.7	1.3	1.7	1.9	1.8
PTotal (µmol/l)	S	-	-	2.5*	-	-	-
	B	-	-	2.4*	-	-	-
NO ₃ ⁻ -N (µmol/l)	S	10.1	11.5	10.7	3.5	3.6	3.6
	B	10.1	11.5	10.7	2.0	2.3	2.2
NO ₂ ⁻ -N (µmol/l)	S	0.3	0.4	0.3	0.4	0.6	0.5
	B	0.3	0.4	0.4	0.6	0.6	0.6
NH ₄ ⁺ -N (µmol/l)	S	ND	0.6	0.4	0.6	0.6	0.6
	B	ND	0.5	0.3	0.5	0.8	0.7
NTotal (µmol/l)	S	-	-	24.3*	-	-	-
	B	-	-	45.9*	-	-	-
PHc (µg/l)	1m	-	-	24.0*	-	-	15.9*
Phenols (µg/l)	S	-	-	33.8*	-	-	22.6*

Air temperature (°C) given in parenthesis *Single value

Table 4.3.12: Water quality at station 12 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	21.8	22.6	22.1	27.5	27.5	27.5
	B	21.8	22.6	22.1	27.0	27.0	27.0
		24.8	24.8	24.8	(28.5)	(28.5)	(28.5)
PH	S	8.2	8.2	8.2	8.1	8.1	8.1
	B	8.2	8.2	8.2	8.1	8.1	8.1
SS (mg/l)	S	-	-	24*	-	-	104*
	B	-	-	62*	-	-	120*
Salinity (ppt)	S	36.9	37.1	37.0	37.2	37.2	37.2
	B	36.9	37.1	37.0	36.8	37.4	37.1
DO (ml/l)	S	5.0	5.0	5.0	4.5	4.5	4.5
	B	5.0	5.0	5.0	4.5	4.7	4.6
BOD (mg/l)	S	-	-	-	-	-	3.6*
	B	-	-	-	-	-	0.6*
PO ₄ ³⁻ -P (µmol/l)	S	0.8	2.0	1.3	0.8	1.2	1.0
	B	0.8	2.0	1.5	1.7	1.8	1.8
PTotal (µmol/l)	S	-	-	2.5*	-	-	-
	B	-	-	2.4*	-	-	-
NO ₃ ⁻ -N (µmol/l)	S	8.1	10.8	9.5	1.9	2.1	2.0
	B	8.1	10.8	9.1	1.4	1.7	1.6
NO ₂ ⁻ -N (µmol/l)	S	0.4	0.6	0.5	0.5	0.5	0.5
	B	0.4	0.6	0.4	0.5	0.6	0.6
NH ₄ ⁺ -N (µmol/l)	S	ND	1.0	0.5	0.5	0.7	0.6
	B	ND	1.0	0.5	0.5	0.8	0.7
NTotal (µmol/l)	S	-	-	30.0*	-	-	-
	B	-	-	35.2*	-	-	-
PHc (µg/l)	1m	-	-	17.2*	-	-	19.0*
Phenols (µg/l)	S	-	-	14.6*	-	-	1.4*

Air temperature (°C) given in parenthesis *Single value

Table 4.3.13: Water quality at station 13 off Mundra during January 2006 and April 2006

Parameter	Level	January 2006			April 2006		
		Min	Max	Avg	Min	Max	Avg
Temperature (°C)	S	21.8	22.1	22.0	28.0	28.1	28.1
	B	21.8	22.0	21.9	28.0	28.0	28.0
		24.5	24.5	24.5	(28.9)	(28.9)	(28.9)
PH	S	8.2	8.2	8.2	8.1	8.1	8.1
	B	8.2	8.2	8.2	8.1	8.1	8.1
SS (mg/l)	S	-	-	32*	-	-	54*
	B	-	-	32*	-	-	54*
Salinity (ppt)	S	37.1	37.3	37.1	37.0	37.2	37.1
	B	37.1	37.1	37.1	37.0	37.2	37.1
DO (ml/l)	S	4.6	5.4	5.0	4.7	4.7	4.7
	B	4.6	5.4	5.0	4.5	4.7	4.6
BOD (mg/l)	S	-	-	-	-	-	2.9*
	B	-	-	-	-	-	1.0*
PO ₄ ³⁻ -P (µmol/l)	S	1.5	1.8	1.7	0.9	1.0	1.0
	B	1.6	1.8	1.7	1.8	1.8	1.8
PTotal (µmol/l)	S	-	-	2.5*	-	-	-
	B	-	-	2.3*	-	-	-
NO ₃ ⁻ -N (µmol/l)	S	8.8	10.6	9.8	1.8	2.3	2.1
	B	8.8	9.9	9.6	1.5	2.3	1.9
NO ₂ ⁻ -N (µmol/l)	S	0.4	0.5	0.5	0.4	0.4	0.4
	B	0.4	0.5	0.5	0.6	0.6	0.6
NH ₄ ⁺ -N (µmol/l)	S	0.2	0.5	0.3	0.6	0.6	0.6
	B	0.2	0.3	0.3	0.6	0.7	0.7
NTotal (µmol/l)	S	-	-	43.3*	-	-	-
	B	-	-	55.2*	-	-	-
PHc (µg/l)	1m	-	-	16.7*	-	-	17.4*
Phenols (µg/l)	S	-	-	4.6*	-	-	21.4*

Air temperature (°C) given in parenthesis *Single value

Table 4.3.14: Water quality at station 7 (Kotdi Creek)
during September 1999

Parameter	Level			
		Min	Max	Av
Temperature (°C)	S	29.8	31.0	30.4
	B	29.0	31.6	30.8
		(29.5)	(34.0)	(31.3)
PH	S	7.9	8.4	8.2
	B	7.9	8.1	8.0
SS (mg/l)	S	49	160	105
	B	70	98	84
Salinity (ppt)	S	38.4	38.9	38.7
	B	38.0	38.8	38.5
DO (ml/l)	S	1.5	5.3	3.4
	B	2.0	5.1	2.7
BOD (mg/l)	S	<0.2	4.1	2.0
	B	<0.2	0.2	0.2
PO ₄ ³⁻ -P (μmol/l)	S	0.5	1.9	1.2
	B	0.7	2.2	1.4
PTotal (μmol/l)	S	-	-	-
	B	-	-	-
NO ₃ ⁻ -N (μmol/l)	S	0.1	10.0	5.0
	B	0.4	7.0	3.7
NO ₂ ⁻ -N (μmol/l)	S	0.2	0.9	0.6
	B	0.2	1.0	0.5
NH ₄ ⁺ -N (μmol/l)	S	ND	3.6	1.8
	B	0.3	1.5	0.6
NTotal (μmol/l)	S	9	26	18
	B	21	39	30
PHc (μg/l)	1m	0.1	0.5	0.3
Phenols (μg/l)	S	38	133	86

Air temperature (°C) given in parenthesis

*Single value

Table 4.3.15: Water quality of Bocha Creek off during 1998-2005

Parameter	June 1998	March 1999	March 2000	June 2003	October 2003	December 2004	May 2005
Temperature (°C)	29.5-30.8 (30.1)	22.0-27.1 (24.4)	25.0-25.8 (25.6)	28.9-29.2 (29.0)	28.7-29.5 (29.0)	23.8-23.9 (23.9)	28.8-29.0 (28.9)
pH	8.2-8.3 (8.2)	8.0-8.3 (8.2)	8.0-8.1 (8.1)	8.0-8.0 (8.0)	8.1-8.2 (8.2)	8.3-8.4 (8.4)	8.2-8.3 (8.3)
SS (mg/l)	122-251 (182)	33-445	42-125 (84)	108-176 (138)	44-94 (72)	24-26 (25)	30-34 (32)
Salinity (ppt)	36.3-41.4 (39.9)	36.2-38.4 (37.0)	38.4-38.7 (38.5)	38.5-38.7 (38.5)	36.5-38.1 (37.3)	37.6-38.2 (38.0)	39.2-39.5 (39.4)
DO (ml/l)	4.0-5.5 (4.4)	2.2-5.3 (3.5)	3.2-4.4 (3.9)	2.7-4.3 (3.7)	3.8-4.7 (4.4)	5.3-5.5 (3.4)	3.8-4.3 (4.0)
BOD (mg/l)	1.8-5.6 (3.5)	<0.2-5.1 (3.1)	1.1-3.9 (2.4)	0.1-2.0 (1.0)	2.2-2.9 (2.6)	2.3-3.1 (2.7)	0.5-3.5 (2.0)
PO ₄ ³⁻ P (µmol/l)	0.9-2.2 (1.5)	0.9-1.7 (1.3)	1.1-1.7 (1.4)	2.2-3.6 (3.6)	0.3-1.3 (1.0)	0.9-1.3 (1.2)	0.3-0.8 (0.5)
NO ₃ ⁻ N (µmol/l)	3.8-33.5 (6.3)	0.1-5.7 (1.4)	0.6-0.9 (0.8)	2.3-3.5 (3.2)	1.9-3.2 (2.4)	1.6-5.5 (3.6)	1.2-2.1 (1.6)
NO ₂ ⁻ N (µmol/l)	0.3-1.0 (0.6)	0.5-0.7 (0.5)	0.3-0.4 (0.3)	0.2-0.4 (0.3)	0.2-0.4 (0.4)	0.3-0.4 (0.4)	0.5-0.6 (0.6)
NH ₄ ⁺ -N (µmol/l)	0.2-4.9 (1.3)	0.9-2.2 (1.3)	0.1-0.3 (0.2)	ND-0.2 (0.1)	0.3-1.9 (0.9)	ND-0.3 (0.2)	1.2-2.2 (1.7)
NTotal (µmol/l)	5.6-54.6 (18.1)	25.2-44.0 (30.8)	50.9-70.9 (60.9)	6.6-12.1 (10.4)	8.0-11.3 (10.2)	-	-
PHc (µg/l)	0.6-1.5 (0.9)	1.0-3.1 (1.8)	2.7 (2.7)	1.1-1.5 (1.3)	6.8-7.1 (7.0)	9.6*	1.5*
Phenols (µg/l)	8-39 (24)	98-111 (108)	38 (38)	17-24 (21)	21-30 (26)	47*	12*

Average value given in parenthesis *Single value

Table 4.3.16: Water quality of Navinal Creek off during 1998-2005

	June 1998	March 1999	March 2000	June 2003	October 2003	December 2004	May 2005
Temperature (°C)	28.5-29.8 (29.0)	25.1-27.0 (26.7)	22.0-27.0 (24.0)	28.5-31.5 (29.2)	28.0-29.7 (29.1)	23.0-23.7 (23.4)	28.2-30.1 (28.8)
pH	8.0-8.2 (8.1)	8.1-8.3 (8.3)	8.1	7.9-8.0 (8.0)	8.0-8.3 (8.2)	8.4	8.2-8.5 (8.3)
SS (mg/l)	236-614 (357)	66-166 (94)	43-94 (65)	80-288 (144)	30-596 (89)	18-24 (21)	80-150 (115)
Salinity (ppt)	36.8-40.7 (39.9)	36.9-40.0 (37.5)	37.2-38.0 (37.6)	38.5-39.0 (38.8)	35.3-37.1 (36.7)	38.2-38.6 (38.4)	37.7-38.5 (38.1)
DO (ml/l)	3.5-4.6 (4.4)	2.9-5.2 (4.0)	18-5.1 (4.2)	2.5-4.5 (3.5)	3.4-5.4 (4.4)	5.3-5.5 (5.4)	1.8-5.0 (3.4)
BOD (mg/l)	2.9-5.2 (4.4)	2.9-4.0 (2.4)	<0.2-2.8 (1.8)	0.3-4.4 (2.5)	0.9-5.1 (3.4)	5.4*	1.2-2.2 (1.7)
PO ₄ ³⁻ -P (µmol/l)	1.3-2.7 (1.8)	0.5-1.8 (1.2)	1.5-2.4 (1.9)	0.9-2.3 (1.8)	0.4-2.1 (1.1)	1.1-1.2 (1.1)	0.9-2.8 (1.9)
NO ₃ ⁻ -N (µmol/l)	4.9-7.7 (6.9)	0.1-1.4 (0.6)	3.5-7.8 (5.4)	0.4-3.9 (3.0)	ND-7.0 (1.6)	2.0-3.4 (2.7)	0.2-8.1 (2.8)
NO ₂ ⁻ -N (µmol/l)	0.5-0.9 (0.7)	0.4-0.7 (0.6)	0.3-0.7 (0.5)	0.2-0.6 (0.5)	0.2-0.8 (0.4)	0.2-0.3 (0.3)	0.8-1.3 (1.1)
NH ₄ ⁺ -N (µmol/l)	0.6-1.4 (1.0)	0.6-2.2 (1.1)	0.1-1.9 (0.4)	0.1-3.2 (0.4)	0.1-4.1 (0.7)	0.2-0.4 (0.3)	0.7-3.0 (1.6)
NTotal (µmol/l)	7.6-38.4 (20.6)	31.2-53.7 (42.1)	-	8.0-73.9 (21.9)	7.6-25.0 (11.7)	-	-
PHc (µg/l)	0.9-1.9 (1.2)	0.9-1.7 (1.3)	1.9-21.0 (11.9)	0.2-2.2 (0.9)	3.7-7.3 (5.0)	26.0*	12.0*
Phenols (µg/l)	8-29 (21)	88-120 (104)	13-141 (64)	38-49 (41)	22-29 (29)	70*	61*

Average value given in parenthesis

*Single value

Table 4.3.17: Water quality of Baradi Mata Creek off during 1998-2005

Parameter	March 1999	October 2003	December 2004	May 2005
Temperature (°C)	24.9-27.6 (26.6)	29.0-31.0 (30.0)	19.0-22.8 (20.9)	28.5-29.1 (28.8)
pH	8.1-8.3 (8.3)	8.1	8.2-8.4 (8.3)	8.3-8.4 (8.4)
SS (mg/l)	49-123 (69)	38-46 (42)	34-42 (38)	36-108 (72)
Salinity (ppt)	36.5-37.2 (36.9)	36.5-37.0 (36.8)	37.6-40.4 (39.0)	38.4-40.6 (39.5)
DO (ml/l)	5.5-6.2 (5.6)	4.5-4.9 (48)	2.4-5.5 (4.0)	4.1-4.6 (4.4)
BOD (mg/l)	1.5-4.4 (2.8)	0.7-5.4 (3.1)	0.2-1.3 (0.8)	0.7-3.0 (2.4)
PO ₄ ³⁻ -P (µmol/l)	0.5-1.5 (1.1)	0.2-1.4 (0.8)	0.3-1.1 (0.7)	0.8-1.8 (1.3)
NO ₃ ⁻ -N (µmol/l)	0.6-2.0 (1.2)	0.1-0.4 (0.3)	0.4-2.7 (1.6)	0.7-1.5 (1.1)
NO ₂ ⁻ -N (µmol/l)	0.1-0.4 (0.3)	0.1-0.2 (0.1)	0.2-0.4 (0.3)	0.3-0.9 (0.6)
NH ₄ ⁺ -N (µmol/l)	1.6-5.1 (2.9)	0.3-2.8 (1.6)	0.3-0.8 (0.6)	0.7-1.2 (1.0)
NTotal (µmol/l)	31.2-47.7 (41.3)	9.8-13.4 (11.6)	-	-
PHc (µg/l)	0.8*	2.2*	12.0-17.8 (15.0)	5.7-31.0 (19.9)
Phenols (µg/l)	91-95 (93)	39*	55-63 (59)	7-19 (13)

Average value given in parenthesis

*Single value

Table 4.3.18: Water quality of Gulf off Mundra/Wandh during 1998-2005

Parameter	June 1998	March 1999	March 2000	June 2003	October 2003	December 2004	May 2005
Temperature (°C)	28.0-28.8 (28.5)	23.1-28.5 (24.7)	21.5-25.5 (24.0)	28.4-30.0 (29.1)	27.7-30.8 (29.7)	27.0-30.1 (29.0)	22.2-24.6 (23.4)
pH	8.2	7.7-8.3 (8.2)	8.0-8.4 (8.2)	7.9-8.0 (8.0)	8.0-8.2 (8.2)	8.1-8.4 (8.3)	8.2-8.5 (8.3)
SS (mg/l)	189-387 (292)	20-170 (69)	20-282 (87)	102-440 (145)	26-166 (89)	44-168 (106)	20-78 (49)
Salinity (ppt)	41.0-41.7 (41.3)	35.9-38.2 (37.3)	37.4-39.3 (38.2)	37.7-39.0 (38.6)	36.1-37.7 (36.6)	37.5-40.5 (39.1)	37.1-38.6 (38.0)
DO (ml/l)	2.0-4.6 (3.9)	1.8-6.2 (4.7)	1.7-5.3 (3.9)	1.9-4.6 (3.4)	2.9-5.2 (4.4)	1.0-4.8 (3.2)	3.1-6.0 (4.6)
BOD (mg/l)	1.3-3.1 (2.3)	<0.2-4.7 (2.2)	0.2-3.4 (1.3)	0.5-4.6 (2.4)	0.9-5.1 (3.3)	1.2-6.4 (3.3)	1.3-5.7 (3.5)
PO ₄ ³⁻ -P (µmol/l)	0.8-1.8 (1.5)	0.4-4.4 (1.7)	0.2-11.7 (1.9)	1.1-3.0 (1.7)	0.5-2.7 (1.1)	0.3-3.1 (1.7)	0.6-1.9 (2.5)
NO ₃ ⁻ -N (µmol/l)	4.4-6.6 (5.8)	ND-6.6 (1.9)	1.1-13.3 (3.4)	1.0-5.1 (3.0)	0.2-7.3 (3.1)	0.1-14.4 (7.3)	0.1-5.7 (2.90)
NO ₂ ⁻ -N (µmol/l)	0.2-0.6 (0.4)	0.1-1.9 (0.4)	0.2-1.3 (0.5)	0.2-0.9 (0.5)	ND-0.7 (0.3)	0.2-1.0 (0.6)	0.1-0.4 (0.3)
NH ₄ ⁺ -N (µmol/l)	0.2-0.6 (0.4)	0.4-6.4 (1.4)	ND-23.5 (1.3)	ND-4.4 (1.1)	ND-14.5 (0.8)	0.5-3.4 (2.0)	0.1-1.8 (1.0)
NTotal (µmol/l)	10.3-26.2 (20.6)	27.9-64.9 (51.1)	-	4.5-12.3 (8.1)	5.6-27.1 (8.8)	-	-
PHc (µg/l)	0.6-0.9 (0.8)	0.4-4.4 (1.3)	1.2-9.9 (2.5)	4.1-4.7 (4.6)	0.8-19.4 (4.6)	3.0-22.2 (12.6)	10.3-26.3 (12.2)
Phenols (µg/l)	4-7 (6)	ND-176 (86)	ND-106 (44)	18-44 (28)	6-66 (41)	11-44 (28)	13-59 (36)

Average value given in parenthesis

*Single value

Table 4.4.2: Sediment quality at station 7
(Kotdi Creek) during September 1999

Metal	Min	Max	Av
Al (%)	6.7	9.7	8.2
Cr ($\mu\text{g/g}$)	95	175	135
Mn ($\mu\text{g/g}$)	608	1091	850
Fe (%)	3.2	6.3	4.8
Co ($\mu\text{g/g}$)	31	52	42
Ni ($\mu\text{g/g}$)	18	34	26
Cu ($\mu\text{g/g}$)	25	95	60
Zn ($\mu\text{g/g}$)	101	104	103
Hg ($\mu\text{g/g}$)	-	-	0.04
C (%)	-	-	0.3
P ($\mu\text{g/g}$)	588	736	662
PHc ($\mu\text{g/g}$)	0.1	0.5	0.3

*Dry wt basis except PHc which is in wet wt.
Average value given in parenthesis

Table 4.4.3: Water quality of Bocha Creek off during 1998-2005

Metal	June 1998	March 1999	March 2000	June 2003	October 2003	December 2004	May 2005
Al (%)	6.4-6.7 (6.6)	9.2-9.3 (9.3)	(8.5)	7.6-7.9 (7.8)	7.0-7.3 (7.2)	8.2	7.1
Cr (µg/g)	61-80 (71)	171-172 (172)	(139)	149-351 (250)	79-80 (80)	50	92
Mn (µg/g)	752-832 (792)	886-900 (893)	(837)	813-1288 (1051)	664-746 (705)	714	807
Fe (%)	4.3-4.7 (4.5)	4.8-5.0 (4.9)	(4.6)	5.1-10.8 (8.0)	4.5-4.9 (4.7)	5.0	4.9
Co (µg/g)	33-34 (34)	42-43 (43)	(39)	22-46 (34)	20-21 (21)	ND	22
Ni (µg/g)	53-59 (56)	66-68 (67)	(59)	59-103 (81)	58-60 (59)	57	80
Cu (µg/g)	33-39 (36)	(47)	(44)	45-157 (101)	47-50 (49)	-	40
Zn (µg/g)	71-79 (75)	98-106 (102)	(92)	123-173 (148)	93-97 (95)	151	77
Hg (µg/g)	0.30-0.53 (0.42)	0.20-0.24 (0.22)	(0.3)	0.29-0.38 (0.34)	-	ND	-
C (%)	0.7-0.8 (0.8)	0.8- 0.9(0.9)	-	0.9-2.0 (15)	0.8-1.0 (0.9)	0.7	0.8
P(µg/g)	1337- 1344 (1341)	807-882 (845)	(693)	815-877 (846)	343-736 (540)	1822	906
PHc (µg/g)	0.1-0.4 (0.3)	1.8-2.4 (2.1)	-	0.7-0.9 (0.8)	-	0.3	0.4

*Dry wt basis except PHc which is in wet wt.
Average value given in parenthesis

Table 4.4.4: Sediment quality of Navinal Creek off during 1998-2005

Metal	June 1998	March 1999	March 2000	June 2003	October 2003	December 2004	May 2005
Al (%)	6.0-6.4 (6.2)	7.6-7.9 (7.8)	(5.7)	7.0-7.5 (7.3)	5.8-6.7 (6.3)	6.9	7.2
Cr (µg/g)	50-54 (52)	136-139 (138)	(136)	140-193 (167)	98-105 (101)	123	90
Mn (µg/g)	718-758 (738)	823-847 (835)	(660)	726-783 (755)	597-672 (635)	1162	820
Fe (%)	4.2-4.4 (4.3)	(4.4)	(4.3)	4.7-4.8 (4.8)	3.6-4.0 (3.8)	5.1	4.4
Co (µg/g)	31-33 (32)	(37)	(36)	19-20 (20)	16-19 (18)	20	22
Ni (µg/g)	49-54 (52)	53-56 (55)	(54)	54-56 (55)	50-52 (51)	59	87
Cu (µg/g)	28-34 (31)	38	(40)	39-41 (40)	38-39 (39)	44	42
Zn (µg/g)	71-73 (72)	84-85 (85)	(79)	94-101 (98)	72-88 (80)	84	85
Hg (µg/g)	0.33-0.69 (0.51)	0.11-0.88 (0.50)	(0.2)	0.19-0.25 (0.22)	-	0.05	-
C (%)	0.7-0.8 (0.8)	(0.9)	-	0.7-0.8 (0.8)	0.7-1.0 (0.9)	0.8	0.9
P (µg/g)	715-1402 (1059)	788-827 (808)	(755)	581-639 (610)	191- 365(278)	790	956
PHc (µg/g)	0.4	1.8-2.3 (2.1)	-	(1.2)	-	0.4	0.4

*Dry wt basis except PHc which is in wet wt.
Average value given in parenthesis

Table 4.4.5: Sediment quality of Gulf off Mundra/Wandh during 1998-2005

Metal	June 1998	March 1999	March 2000	June 2003	October 2003	December 2004	May 2005
Al (%)	1.5-4.2 (2.9)	0.6-7.6	(3.5)	0.6-5.9	1.3-4.8	1.8-4.9 (3.3)	1.9-6.2 (4.6)
Cr (µg/g)	28-66 (47)	7-150	(62)	15-75	18-41	73-102 (75)	19-60 (47)
Mn (µg/g)	408-546 (477)	431-772	(610)	454-621	312-490	555-995 (716)	274-730 (554)
Fe (%)	1.0-3.2 (2.1)	1.1-4.6	(2.6)	1.0-3.8	0.8-2.4	1.7-4.4 (3.2)	1.0-4.2 (2.9)
Co (µg/g)	11-21 (16)	15-41	(29)	0.7-14	2-8	3-16 (9.7)	4-16 (12)
Ni (µg/g)	11-22 (17)	ND-52	(29)	7-36	6-21	12-51 (26)	16-64 (45)
Cu (µg/g)	9-31 (20)	6-43	(20)	7-22	10-16	8-34 (19)	8-31 (22)
Zn (µg/g)	15-56 (36)	14-88	(66)	27-85	20-48	39-111 (71)	13-100 (55)
Hg (µg/g)	0.12-0.17 (0.15)	0.7-0.48	(0.5)	0.22-0.40	-	0.04-0.14 (0.09)	-
C (%)	0.1-0.3 (0.2)	0.1-0.7	-	0.2-0.8	0.1-0.23	0.2-0.5 (0.3)	0.1-0.6 (0.3)
P (µg/g)	337-746	341-802	(588)	291-637	102-275	465-883 (674)	474-857 (731)
PHc (µg/g)	0.3	0.1-2.8	-	0.6-1.0	-	0.1-0.4 (0.3)	0.1-0.3 (0.2)

*Dry wt basis except PHc which is in wet wt.
Average value given in parenthesis

Table 4.5.1 : (a) Mangrove areas and status of occurrence of major species of Gujarat (b) Composition and ecological status of mangroves and obligate halophytes off Mundra.

(a)*

District	1992	1998
Mangroves areas (km²)		
Kachchh	601.8	938.0
Jamnagar	13.12	98.3
Junagad	0.8	0.3
Bhavnagar	14.5	6.2
Bharuch	10.9	17.1
Surat	7.8	5.0
Valsad	-	5.0
Total	767.0	1066.9
Status of occurrence of major species		
Species	1950	1998
<i>Avicennia</i>	Common	Common
<i>Rhizosolenia</i>	Common	Vulnerable
<i>Aegiceras</i> sp	Common	Endangered
<i>Ceriops tagal</i>	Common	Vulnerable
<i>Sonneratia apetala</i>	Common	Vulnerable
<i>Bruigeria</i> sp.	Common	Absent
* Based on satellite data		

(b)*

Species	Habit	Habitat	Ecological status
Mangroves			
<i>Avicennia marina</i>	Tree, shrubs	Intertidal	Dominant
<i>Rhizophora mucronata</i>	Tree	Intertidal	Stray
<i>Salvadora persica</i>	Tree, shrubs	Supralittoral	Common
Obligate Halophyta			
<i>Sesuvium portulacastrum</i>	Runner	Lower Supralittoral	Common
<i>Salicornia brachiata</i>	Shrub	Supralittoral	Common
<i>Sueda maritime</i>	Shrub	Supralittoral	Rare

Table 4.5.2 : Range and average (parenthesis) of phytoplankton pigments off Mundra/ Wadh during January 2006

Station	Chlorophyll/a (mg/m)		Phaeophytin (mg/m)		Chl/a/Phaeo	
	S	B	S	B	S	B
1	12.4-14.1 (13.3)	3.8-8.8 (6.3)	9.2-9.4 (9.3)	6.3-10.2 (8.3)	1.3-1.5 (1.4)	0.6-0.9 (0.8)
2	0.4-1.7 (1.1)	0.4-1.9 (1.2)	0.7-1.8 (1.3)	1.4-2.1 (1.9)	0.2-2.5 (1.4)	0.2-1.4 (0.8)
3	0.2-0.4 (0.3)	0.2-0.2 (0.2)	0.2-2.0 (1.1)	0.2-2.2 (1.2)	0.1-0.2 (0.2)	0.1-0.1 (0.1)
4	0.2-0.6 (0.4)	0.2-0.4 (0.3)	1.0-1.6 (1.3)	0.9-1.4 (1.2)	0.1-0.6 (0.4)	0.1-0.5 (0.3)
5	0.2-0.4 (0.3)	0.2-0.4 (0.3)	0.5-3.8 (1.6)	0.4-1.9 (1.2)	0.1-0.9 (0.3)	0.1-0.8 (0.4)
6	0.2-0.9 (0.3)	0.2-0.6 (0.4)	1.1-1.9 (1.6)	1.5-3.7 (2.6)	0.1-0.8 (0.3)	0.1-0.3 (0.2)
7	0.4-1.7 (1.1)	0.2-1.1 (0.7)	1.3-2.4 (1.9)	1.2-2.2 (1.7)	0.2-1.3 (0.2)	0.1-0.9 (0.5)
8	0.4-1.1 (0.8)	0.4-0.6 (0.5)	1.8-2.3 (2.1)	1.8-3.5 (2.7)	0.2-0.6 (0.4)	0.2-0.2 (0.2)
9	0.2-0.6 (0.4)	0.4-0.4 (0.4)	1.0-1.4 (1.2)	0.8-0.9 (0.9)	0.9-0.6 (0.4)	0.5-0.6 (0.6)
10	0.6-0.9 (0.8)	0.4-0.9 (0.7)	0.6-0.7 (0.7)	0.8-2.4 (1.6)	0.9-1.3 (1.1)	0.2-1.1 (0.7)
11	0.4-1.5 (1.0)	0.6-0.6 (0.6)	0.4-1.7 (1.1)	0.1-1.5 (0.8)	0.3-3.3 (1.8)	0.3-0.4 (0.4)
12	0.2-0.4 (0.2)	0.2-0.2 (0.2)	1.4-2.2 (1.8)	2.3-2.3 (2.3)	0.1-0.3 (0.2)	0.1-0.1 (0.1)
13	0.9-1.1 (1.0)	1.1-1.1 (1.1)	0.9-1.1 (1.0)	0.9-1.0 (1.0)	0.8-1.2 (1.0)	1.0-1.2 (1.1)

Table 4.5.3 : Distribution of phytoplankton pigment off Mundra/Wandh during January 2006.

Station	Date	Time/ Tide	Chlorophyll a (mg/m ³)		Phaeophytin (mg/m ³)		Ratio of Chl a to Phaeo	
			S	B	S	B	S	B
1	07.01.06	1030 (Eb)	14.1	8.8	9.2	10.2	1.5	0.9
		1045 (Eb)	12.4	3.8	9.4	6.3	1.3	0.6
2	07.01.06	1130 (Eb)	0.4	0.4	1.8	2.1	0.2	0.2
		1145 (Eb)	1.7	1.9	0.7	1.4	2.5	1.4
3	07.01.06	1245 (Eb)	0.4	0.2	2.0	2.2	0.2	0.1
		1300 (Eb)	0.2	0.2	0.2	0.2	0.1	0.1
4	09.01.06	0900 (Fl)	0.6	0.4	1.2	0.9	0.6	0.5
		1100 (Eb)	0.6	0.2	1.0	1.7	0.6	0.1
		1300 (Eb)	0.2	0.4	1.6	0.9	0.1	0.5
		1500 (Eb)	0.2	0.2	1.0	1.4	0.2	0.1
5	10.01.06	0900 (Fl)	0.2	0.2	1.4	1.9	0.1	0.1
		1100 (Fl)	0.4	0.2	0.5	0.4	0.9	0.6
		1300 (Eb)	0.2	0.2	1.7	1.3	0.2	0.4
		1500 (Eb)	0.4	0.4	1.2	1.1	0.4	0.4
		1700 (Eb)	0.4	0.4	3.8	1.4	0.1	0.3
		1900 (Eb)	0.2	0.4	1.6	0.9	0.1	0.5
		2000 (Fl)	0.4	0.2	1.2	1.1	0.4	0.8

Table 4.5.3 (Contd 2)

Station	Date	Time/ Tide	Chlorophyll a (mg/m ³)		Phaeophytin (mg/m ³)		Ratio of Chl a to Phaeo	
			S	E	S	E	S	E
6	05.01.06	1200 (Eb)	0.9	0.6	1.1	2.9	0.8	0.2
		1400 (Fl)	0.2	0.2	1.6	3.7	0.1	0.1
		1600 (Fl)	0.2	0.2	1.9	2.2	0.1	0.1
		1800 (Fl)	0.2	0.4	1.9	1.5	0.1	0.3
7	09.01.06	0800 (Eb)	1.7	1.1	1.3	1.2	1.3	0.9
		0815 (Eb)	0.4	0.2	2.4	2.2	0.2	0.1
8	08.01.06	1030 (Eb)	1.1	0.6	1.8	3.5	0.6	0.2
		1045 (Eb)	0.4	0.4	2.3	1.8	0.2	0.2
9	02.01.06	0930 (Eb)	0.6	0.4	1.0	0.9	0.6	0.5
		0945 (Eb)	0.2	0.4	1.4	0.8	0.1	0.6
10	02.01.06	0930 (Fl)	0.9	0.4	0.6	2.4	1.3	0.2
		0945 (Fl)	0.6	0.9	0.7	0.8	0.9	1.1
11	11.01.06	1115 (Eb)	0.4	0.6	1.7	0.1	0.3	6.0
		1130 (Eb)	1.5	0.6	0.4	1.5	3.3	0.4
12	11.01.06	1315 (Eb)	0.2	0.2	2.2	2.3	0.1	0.1
		1330 (Eb)	0.4	0.2	1.4	2.3	0.3	0.1
13	11.01.06	1400 (Eb)	0.9	1.1	1.1	0.9	0.8	1.2
		1415 (Eb)	1.1	1.1	0.9	1.0	1.2	1.0

Table 4.5.4 (Contd 2)

[illegible]

Table 4.5.5: Range and average (parenthesis) of phytoplankton population off Mundra/Wandh during January 2006.

Station	Date	Cell count (nox10 ³ /l)		Total genera (no)		Major genera	
		S	B	S	B	S	B
1	07.01.06	1344.7*	5761.5*	8*	7*	Thalassiosira Fragilaria Gyrosigma Leptocylindrus	Thalassiosira Fragilaria Nitzschia Gyrosigma
2	07.01.06	48.0*	40.8*	18*	16*	Melosira Skelettonema Coccinodiscus Thalassiosira	Melosira Thalassiosira Navicula Biddulphia
3	07.01.06	28.8*	32.8*	15*	18*	Melosira Thalassiosira Thalassionema Biddulphia	Chaetoceros Bacillaria Navicula Melosira
4	09.01.06	12.8-13.6 (13.2)	11.2-19.2 (15.2)	10-10 (10)	9-11 (10)	Navicula Thalassiosira Diploneis Fragilaria	Fragilaria Guinardia Thalassiothrix Biddulphia
5	10.01.06	8.0-10.4 (9.2)	11.2-36.8 (24)	10-12 (11)	11-16 (14)	Thalassiosira Rhizosolenia Coccinodiscus Nitzschia	Fragilaria Thalassionema Coccinodiscus Thalassiosira
6	05.01.06	20.8*	18.4*	14*	11*	Nitzschia Coccinodiscus Melosira Thalassiosira	Thalassiosira Navicula Coccinodiscus Thalassionema
7	09.01.06	97.6*	13.6*	13*	8*	Thalassiosira Fragilaria Biddulphia Navicula	Nitzschia Melosira Fragilaria Thalassiosira

Table 4.5.5 (Contd 2)

Station	Date	Cell count ($\text{nox}10^3/\text{l}$)		Total genera (no)		Major genera	
		S	B	S	B	S	B
8	08.01.06	16.8*	51.2*	9*	15*	Melosira Skelettonema Coscinodiscus Thalassionema	Fragilaria Thalassiosira Thalassionema Ditylum
9	08.01.06	18.4*	27.2	13*	14*	Thalassionema Nitzschia Biddulphia Coscinodiscus	Fragilaria Coscinodiscus Melosira Thalassiosira
10	08.01.06	12.0*	13.6*	11*	12*	Melosira Coscinodiscus Biddulphia Thalassiosira	Pseudoguinaridia Nitzschia Coscinodiscus Diploneis
11	11.01.06	5.2*	4.8*	11*	10*	Thalassiosira Thalassionema Navicula Nitzschia	Thalassionema Thalassiosira Coscinodiscus Ditylum
12	11.01.06	12.0*	32.8*	10*	15*	Thalassionema Rhizosolenia Diploneis Coscinodiscus	Thalassionema Chaetoceros Nitzschia Biddulphia
13	11.01.06	9.6*	19.2*	8*	17*	Biddulphia Nitzschia Thalassiosira Rhizosolenia	Thalassiosira Nitzschia Navicula Gyrosigma

* Single reading.

Table 4.5.6 : Distribution of phytoplankton population off Mundra/Wandh during January 2006.

Station	Date	Time (Tide)	cell count (no $\times 10^3$ /l)		Total genera (no)	
			S	B	S	B
1	07.01.06	1030 (Eb)	1344.7	5761.5	8	7
2	07.01.06	1130 (Eb)	48.0	40.8	18	16
3	07.01.06	1245 (Eb)	28.8	32.8	15	18
4	09.01.06	0900 (FI)	12.8	19.2	10	10
		1530 (Eb)	13.6	11.2	9	11
5	10.01.06	1600 (Eb)	8.0	11.2	10	11
		1000 (FI)	10.4	36.8	12	16
6	05.01.06	1200 (Eb)	20.8	18.4	14	11
7	09.01.06	0800 (FI)	97.6	13.6	13	8
8	08.01.06	1030 (Eb)	16.8	51.2	9	15
9	08.01.06	0930 (Eb)	18.4	27.2	13	14
10	08.01.06	1115 (FI)	12.0	13.6	11	12
11	11.01.06	1230 (Eb)	5.2	4.8	11	10
12	11.01.06	1315 (Eb)	12.0	32.8	10	13
13	11.01.06	1330 (Eb)	9.6	19.2	8	17

Table 4.5.7 : Range and average (parenthesis) of phytoplankton population off Mundra/Wandh during 1998-2006.

Station	Parameter	Level	July 1998	August 1998	March 1999	September 1999	March 2000
Bocha Creek	Cell count (nox10 ³ /l)	S	12.3-26.5 (17.4)	16.0-132.2 (70.7)	47.6-187.2 (89.8)	-	12.0-18.9 (14.85)
		B	12.0 (12)	-	48-51.2 (49.6)	-	22.1 (22.1)
	Total genera (no)	S	4-9 (5)	5-14 (9)	9-11 (10)	-	11-17 (14)
		B	5 (5)	-	9-10 (10)	-	15 (15)
	Major genera	S	Nitzschia	Hemiaulus Surirella	Navicula Nitzschia Thalassiosira Biddulphia Nitzschia	-	Nitzschia Navicula Rhizosolenia
		B	Nitzschia	-	Nitzschia	-	Nitzschia Thalassiosira Navicula
Navinal Creek	Cell count (nox10 ³ /l)	S	13.8-16.0 (14.9)	25.3-92.6 (50.0)	50.4-61.2 (58.8)	-	3.1-19.4 (9.8)
		B	4.0-6.5 (5.3)	-	-	-	7.0-16.0 (11.0)
	Total genera (no)	S	5-5 (5)	6-7 (7)	8-11 (10)	-	10-13 (11)
		B	4-4 (4)	-	-	-	8-16 (12)
	Major genera	S	Fragilaria Nitzschia	Fragilaria Thalassiosira	Thalassiothrix Nitzschia Thalassionema Coscinodiscus	-	Thalassiosira Coscinodiscus Nitzschia Fragilaria Navicula
		B	Nitzschia Coscinodiscus	-	-	-	Nitzschia Thalassiosira Fragilaria Gyrosigma Navicula

Table 4.5.7 (Contd 2)

Station	Parameter	Level	June 2003	October 2003	December 2004	May 2005	January 2006
Bocha Creek	Cell count (nox10 ³ /l)	S	145.2-234 (189.6)	172.2-206.4 (189.3)	134.2	14.0-160.4 (97.0)	9.6
		B	75.6-201.6 (138.6)	134.4-168 (151.2)	389.6	4.8-256.8 (133.2)	19.2
	Total genera (no)	S	14-18 (16)	17-23 (20)	21	9-11 (10)	8
		B	8-14 (11)	13-22 (18)	17	5-12 (10)	17
	Major genera	S	Nitzschia Thalassiosira Skeletonema	Thalassiosira Thalassionema	Chaetoceros Bacillaria Melosira Nitzschia	Skeletonema Nitzschia Thalassionema Thalassiosira	Biddulphia Nitzschia Thalassiosira Rhizosolenia
		B	Nitzschia Navicula Thalassiosira	Thalassiosira Nitzschia	Chaetoceros Nitzschia Rhizosolenia Navicula	Skeletonema Thalassiosira Navicula Nitzschia	Thalassiosira Nitzschia Navicula Gyrosigma
Navinal Creek	Cell count (nox10 ³ /l)	S	124.2-135.0 (129.6)	105.4-113.4 (109.4)	289	256	12.0
		B	102.4-188 (105.6)	52.0-147.6 (98.8)	759.2	444.8	32.8
	Total genera (no)	S	14-14 (14)	19-22 (21)	15	9	10
		B	9-11 (10)	17-19 (18)	15	11	15
	Major genera	S	Thalassiosira Nitzschia Navicula Coscinodiscus	Thalassiosira Fragilaria Nitzschia Coscinodiscus	Chaetoceros Skeletonema Rhizosolenia Nitzschia	Skeletonema Thalassionema Rhizosolenia Thalassiosira	Thalassionema Rhizosolenia Diploneis Coscinodiscus
		B	Nitzschia Thalassiosira Coscinodiscus Navicula	Fragilaria Nitzschia Thalassiosira Biddulphia	Chaetoceros Rhizosolenia Navicula Nitzschia	Skeletonema Thalassionema Thalassiosira Thalassiothrix	Thalassionema Chaetoceros Nitzschia Biddulphia

Table 4.5.7 (Contd 3)

Station	Parameter	Level	July 1998	August 1998	March 1999	September 1999	March 2000
Baradi Ma a Creek	Cell count ($\text{nox}10^3/\text{l}$)	S	-	197-413 (318.33)*	61.2	-	-
		B	-	188-336 (289.8)	60.8	-	-
	Total genera (no)	S	-	11-13 (12)	8	-	-
		B	-	11-12 (12)	11	-	-
	Major genera	S	-	Fragillaria	Nitzschia Navicula Fragillaria	-	-
		B	-	Fragillaria	Nitzschia Coscinodiscus Navicula Fragillaria	-	-
Gulf (Mundra)	Cell count ($\text{nox}10^3/\text{l}$)	S	5.7-6.8 (6.3)	4.8-36.5 (19.1)	57.0-75.2 (67.9)	-	2.1-18.9 (10)
		B	3.5-3.7 (3.6)	-	36.4-87.0 (62.3)	-	1.4-19.6 (10)
	Total genera (no)	S	2-3 (3)	3-8 (5)	7-13 (10)	-	8-14 (110)
		B	2-2 (2)	-	8-13 (11)	-	8-16 (11)
	Major genera	S	Nitzschia Pleurosigma	Nitzschia Thalassiosira	Coscinodiscus Synedra Thalassiosira	-	Nitzschia Thalassiosira Navicula
		B	Nitzschia Coscinodiscus	-	Thalassiosira Coscinodiscus Synedra	-	Nitzschia Thalassiosira Rhizosolenia

Table 4.5.7 (Contd 4)

Station	Parameter	Level	June 2003	October 2003	December 2004	May 2005	January 2006
Baradi Mata Creek	Cell count (nox10 ³ /l)	S	196.0	183.6	285-1194 (807)	52.8-104.8 (78.8)	12.0
		B	132.0	154.4	236-3817 (2027)	16.0-92.8 (54.4)	13.6
	Total genera (no)	S	13	19	13-16 (14)	8-19 (14)	11
		B	13	21	14-19 (16)	11-12 (12)	12
Gulf (Mundra)	Major genera	S	Thalassiosira Navicula Nitzschia Rhizosolenia	Thalassiosira Fragilaria Nitzschia	Chaetoceros Rhizosolenia Navicula Nitzschia	Skeletonema Nitzschia Thalassionema	Melosira Coscinodiscus Biddulphia Thalassiosira
		B	Nitzschia Navicula Skeletonema Coscinodiscus	Nitzschia Thalassiosira Chaetoceros	Chaetoceros Rhizosolenia Nitzschia	Skeletonema Thalassiosira	Pseudoguinaria Nitzschia Coscinodiscus Diploneis
	Cell count (nox10 ³ /l)	S	12.9-204 (70.8)	26-202 (89.3)	41-12781 (2111)	31.2-18.2 (82.3)	5.2-1345 (167)
		B	33.8-427.2 (110.9)	34.6-339 (134)	58-10476 (1566)	18.0-624 (110)	4.8-5762 (664)
Gulf (Mundra)	Total genera (no)	S	8-13 (10)	9-22 (16)	12-22 (17)	10-14 (12)	8-18 (12)
		B	9-13 (11)	9-22 (16)	13-19 (16)	9-17 (13)	7-18 (13)
	Major genera	S	Coscinodiscus Navicula Nitzschia Thalassiosira	Nitzschia Thalassiosira Rhizosolenia	Chaetoceros Nitzschia Rhizosolenia Thalassiosira	Skeletonema Nitzschia Thalassiothrix Navicula	Thalassiosira Coscinodiscus Navicula Rhizosolenia
		B	Coscinodiscus Navicula Nitzschia Thalassiosira	Nitzschia Thalassiosira Fragilaria	Chaetoceros Nitzschia Rhizosolenia Melosira	Nitzschia Thalassiothrix Navicula Coscinodiscus	Thalassiosira Coscinodiscus Navicula Fragilaria

Table 4.5.7 (Contd 5)

Station	Parameter	Level	July 1998	August 1998	March 1999	September 1999	March 2000
Kotdi Creek	Cell count (no $\times 10^3/l$)	S	-	-	-	1140-1789 (1465)	-
		B	-	-	-	-	-
	Total genera (no)	S	-	-	-	13-14 (14)	-
		B	-	-	-	-	-
	Major genera	S	-	-	-	<i>Thalassiosira</i> <i>Nitzschia</i> <i>Fragilaria</i> <i>Hemiaulus</i>	-
		B	-	-	-	-	-

Table 4.5.7 (Contd 6)

Station	Parameter	Level	June 2003	October 2003	December 2004	May 2005	January 2006
Kotdi Creek	Cell count ($\text{nox}10^3/\text{l}$)	S	-	-	-	-	97.6
		B	-	-	-	-	13.6
	Total genera (no)	S	-	-	-	-	13
		B	-	-	-	-	8
	Major genera	S	-	-	-	-	<i>Thalassiosira</i> <i>Fragilaria</i> <i>Biddulphia</i> <i>Navicula</i>
		B	-	-	-	-	<i>Nitzschia</i> <i>Melosira</i> <i>Fragilaria</i> <i>Thalassiosira</i>

Table 4.5.8 : Abundance of phytoplankton off Mundra/Wandh during January 2006.

Name of the genera	Station												
	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Amphiprora</i>	+	-	+	-	+	+	-	+	+	+	-	-	+
<i>Amphora</i>	+	-	-	-	+	-	-	-	-	-	-	-	-
<i>Asteromphalus</i>	-	-	-	-	+	+	-	-	-	-	-	-	-
<i>Bacillaria</i>	-	+	+	-	+	-	-	+	-	+	-	+	-
<i>Bellerochea</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Biddulphia</i>	-	+	+	+	+	+	+	+	+	+	+	+	+
<i>Chaetoceros</i>	-	+	+	-	-	-	-	-	-	-	-	+	+
<i>Coscinodiscus</i>	-	+	+	+	+	+	+	+	+	+	+	+	+
<i>Cylindrotheca</i>	-	-	-	-	-	-	+	-	+	+	-	-	+
<i>Cyclotella</i>	-	-	-	+	-	-	-	-	-	-	-	-	-
<i>Diploneis</i>	-	-	-	+	+	-	-	+	+	+	+	+	-
<i>Dictyocha</i>	-	+	-	-	-	-	-	-	-	-	-	-	-
<i>Ditylum</i>	-	+	+	-	+	+	+	+	+	+	+	+	+
<i>Eucampia</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>Fragillaria</i>	+	+	+	+	+	-	+	+	+	+	+	+	+
<i>Guinardia</i>	-	-	-	+	-	-	-	-	-	-	-	-	-
<i>Gyrosigma</i>	+	+	+	+	+	+	+	+	+	-	-	+	+
<i>Hemiaulus</i>	-	-	-	-	-	-	+	-	-	-	-	-	+
<i>Hyalodiscus</i>	-	+	+	-	-	-	-	-	-	-	-	-	-
<i>Leptocylindrus</i>	+	-	-	-	-	-	-	-	-	-	-	-	-
<i>Licmophora</i>	-	-	-	-	+	+	-	-	-	-	-	-	-
<i>Melosira</i>	-	+	+	-	-	+	+	+	+	+	+	+	-
<i>Meuniera</i>	-	-	-	-	-	-	-	-	-	+	-	-	-
<i>Navicula</i>	+	+	+	+	+	+	+	+	+	-	+	+	+
<i>Nitzschia</i>	+	+	+	+	+	+	+	-	+	+	+	+	+
<i>Peridinium</i>	-	-	+	+	-	-	-	-	-	-	-	+	-
<i>Pleurosigma</i>	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Protoperidinium</i>	-	-	-	-	-	-	-	+	-	-	-	-	-
<i>Pseudoguinardia</i>	-	-	-	-	-	+	-	-	-	+	-	-	+
<i>Rhizosolenia</i>	-	+	+	+	+	+	+	+	+	+	+	+	+
<i>Skeletonema</i>	-	+	-	-	-	-	-	+	-	-	-	-	-
<i>Stauroneis</i>	-	+	-	-	-	-	-	-	-	-	-	-	-
<i>Streptotheca</i>	-	-	-	-	+	-	-	+	+	-	-	-	-
<i>Surirella</i>	-	+	-	-	+	-	+	+	+	-	+	+	-
<i>Synedra</i>	-	+	+	-	-	+	-	-	-	-	-	-	+
<i>Thalassionema</i>	+	+	+	-	+	+	-	+	+	+	+	+	+
<i>Thalassiosira</i>	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Thalassiothrix</i>	+	+	+	+	-	-	-	-	-	-	-	-	-
<i>Trichodesmium</i>	-	-	-	-	-	-	-	-	-	-	-	+	-
<i>Tropidoneis</i>	-	-	-	-	+	-	-	-	-	-	-	-	-
<i>Unidentified</i>	-	-	-	-	+	+	+	-	-	-	-	+	-
Total genera	11	12	19	14	21	17	15	18	17	16	13	19	18

Table 4.5.9 : Range and average (parenthesis) of zooplankton off Mundra/Wandh during January 2006.

Station (Date)	Biomass (mg/100 m ³)	Population (nox10 ³ /100 m ³)	Total groups (no)	Major group (%)
1 (07.01.2006)	6.1-12.6 (9.4)	44.4-141.0 (92.7)	17-21 (19)	Copepods (54.8), foraminiferans (16.4), decapod larvae (8.5), chaetognaths (6.5), ostracods (5.4), gastropods (4.6), lamellibranchs (3.6), siphonophores (0.1), medusae (0.1), ctenophores (0.1), others (0.1).
2 (07.01.2006)	3.1-8.0 (5.6)	26.6-46.2 (36.4)	16-19 (18)	Copepods (46.0), decapod larvae (21.9), chaetognaths (8.8), foraminiferans (8.1), lamellibranchs (7.2), gastropods (6.8), siphonophores (0.4), ctenophores (0.2), polychaetes (0.2), medusae (0.1), ostracods (0.1), fish larvae (0.1), others (0.1).
3 (07.01.2006)	3.5-5.5 (4.5)	25.2-32.1 (28.6)	14-15 (15)	decapod larvae (62.6), copepods (35.9), chaetognaths (0.4), gastropods (0.3), foraminiferans (0.2), siphonophores (0.2), ctenophores (0.1), polychaetes (0.1), lamellibranchs (0.1), others (0.1).
4 (09.01.2006)	1.9-5.5 (3.1)	5.1-34.7 (21.4)	14-18 (17)	Copepods (53.9), decapod larvae (24.2), gastropods (7.2), chaetognaths (6.4), lamellibranchs (5.2), ctenophores (1.5), appendicularians (0.6), siphonophores (0.2), medusae (0.2), polychaetes (0.2), foraminiferans (0.1), ostracods (0.1) others (0.2).

Table 4.5.9 (Contd 2)

Station (Date)	Biomass (m/100 m)	Population (no/10/100 m)	Total groups (no)	Major group (%)
5 (10.01.2006)	1.6-13.1 (5.0)	5.1-29.7 (18.5)	14-20 (16)	Copepods (61.3), gastropods (13.5), decapod larvae (8.1), chaetognaths (6.8), ostracods (5.8), siphonophores (1.2), medusae (0.9), polychaetes (0.8), ctenophores (0.6), appendicularians (0.4), foraminiferans (0.2), lamellibranchs (0.1), fish larvae (0.1), mysids (0.1), others (0.7).
6 (05.01.2006)	2.2-9.5 (5.5)	10.6-40.7 (25.4)	14-19 (17)	Copepods (61.5), decapod larvae (15.2), polychaetes (12.4), chaetognaths (8.1), ostracods (0.6), mysids (0.6), siphonophores (0.3), ctenophores (0.3), medusae (0.2), gastropods (0.2), lamellibranchs (0.2), appendicularians (0.2), foraminiferans (0.1), others (0.1).
7 (08.01.2006)	2.1-2.9 (2.5)	14.4-18.8 (16.6)	16-18 (17)	Copepods (69.1), decapod larvae (25.8), chaetognaths (2.4), gastropods (0.6), polychaetes (0.5), foraminiferans (0.4), siphonophores (0.2), medusae (0.2), ctenophores (0.2), ostracods (0.1), lamellibranchs (0.1), appendicularians (0.1), fish larvae (0.1), others (0.2).

Table 4.5.9 (Contd 3)

Station (Date)	Biomass (mg/100 m)	Population (no./100 m)	Total groups (no)	Major group (%)
8 (08.01.2006)	3.8-8.1 (5.9)	15.3-24.1 (18.6)	15-18 (17)	Copepods (52.8), decapod larvae (21.0), gastropods (12.1), chaetognaths (6.6), ctenophores (2.4), ostracods (2.5), siphonophores (1.4), lamellibranchs (0.4), foraminiferans (0.2), medusae (0.1), polychaetes (0.1), appendicularians (0.1), fish eggs (0.1), fish larvae (0.1), others (0.1).
9 (08.01.2006)	2.2-10.6 (6.4)	14.7-19.3 (17.0)	13-17 (15)	Copepods (59.7), decapod larvae (35.2), gastropods (2.1), chaetognaths (1.3), ctenophores (0.6), siphonophores (0.3), polychaetes (0.2), fish larvae (0.2), medusae (0.1), appendicularians (0.1), others (0.2).
10 (11.01.2006)	1.9-3.0 (2.5)	1.7-3.2 (2.4)	11-15 (13)	Copepods (70.2), gastropods (9.8), ostracods (9.1), decapod larvae (3.2), lamellibranchs (3.2), foraminiferans (2.0), siphonophores (1.1), chaetognaths (0.8), polychaetes (0.3), amphipods (0.1), others (0.2).
11 (11.01.2006)	3.6-4.9 (4.3)	11.6-15.5 (13.5)	14-15 (15)	Copepods (52.9), decapod larvae (44.4), gastropods (1.1), chaetognaths (1.0), ostracods (0.2), foraminiferans (0.1), lamellibranchs (0.1), fish eggs (0.1), others (0.1).

Table 4.5.9 (Contd 4)

Station (Date)	Biomass (ml/100 m ³)	Population (no x 10 ³ /100 m ³)	Total groups (no)	Major groups (%)
12 (11.01.2006)	3.3-4.5 (3.9)	4.9-5.8 (5.3)	13-16 (15)	Copepods (73.0), decapod larvae (21.0), gastropods (1.4), siphonophores (0.8), lamellibranchs (0.8), fish eggs (0.8), chaetognaths (0.7), polychaetes (0.6), foraminiferans (0.3), appendicularians (0.3), stomatopods (0.2), others (0.1).
13 (11.01.2006)	2.3-6.7 (4.5)	3.7-10.4 (7.0)	14-18 (16)	Copepods (46.7), decapod larvae (40.8), gastropods (5.3), lamellibranchs (2.7), fish eggs (2.7), chaetognaths (0.6), foraminiferans (0.4), polychaetes (0.2), siphonophores (0.1), fish larvae (0.1), isopods (0.1), marine insects (0.1) others (0.1).

Table 4.5.10 : Distribution of zooplankton off Mundra/Wandh during January 2006.

Station (Date)	Time (h) Tide	Biomass (ml/100 m ³)	Population (no x 10 ³ /100 m ³)	Total groups (no)	Major group (%)
1 (07.04.06)	1030 (Eb)	12.6	141.0	17	Copepods (55.2), foraminiferans (18.5), decapod larvae (9.2), chaetognaths (5.7), ostracods (4.2), gastropods (3.9), lamellibranchs (3.1), ctenophores (0.1), medusae (0.1), siphonophores (0.1), others (0.1).
	1045 (Eb)	6.1	44.4	21	Copepods (53.7), foraminiferans (10.6), ostracods (8.9), chaetognaths (8.3), gastropods (6.6), decapod larvae (6.0), lamellibranchs (5.2), siphonophores (0.2), medusae (0.1), ctenophores (0.1), mysids (0.1), others (0.2).
2 (07.04.06)	1130 (Eb)	8.0	26.6	19	Copepods (51.8), decapod larvae (26.2), chaetognaths (9.6), lamellibranchs (6.5), foraminiferans (4.5), siphonophores (0.3), gastropods (0.3), ctenophores (0.2), ostracods (0.2), polychaetes (0.1), fish larvae (0.1), medusae (0.1), others (0.1).
	1145 (Eb)	3.1	46.2	16	Copepods (42.8), decapod larvae (19.4), gastropods (10.6), foraminiferans (10.1), chaetognaths (8.4), lamellibranchs (7.5), siphonophores (0.4), polychaetes (0.21), ctenophores (0.2), medusae (0.1), ostracods (0.1), fish larvae (0.1), others (0.1).

Table 4.5.10 (Contd 2)

Station (Date)	Time (h)/Tide	Biomass (ml/100 m ³)	Population (no x 10 ³ /100 m ³)	Total groups (no)	Major group (%)
3 (07.04.06)	1245 (Eb)	3.5	25.2	14	Decapod larvae (63.7), copepods (34.4), chaetognaths (0.6), siphonophores (0.3), gastropods (0.2), foraminiferans (0.2), lamellibranchs (0.1), polychaetes (0.1), ctenophores (0.1), fish larvae (0.1), others (0.1).
	1300 (Eb)	5.5	32.1	15	Decapod larvae (61.8), copepods (37.0), chaetognaths (0.3), gastropods (0.3), foraminiferans (0.2), polychaetes (0.1), lamellibranchs (0.1), siphonophores (0.1), others (0.1).
4 (09.04.06)	0900 (Fl)	5.5	31.2	18	Copepods (58.5), decapod larvae (35.0), ctenophores (2.5), chaetognaths (1.8), appendicularians (1.1), gastropods (0.3), foraminiferans (0.2), medusae (0.2), polychaetes (0.1), mysids (0.1), fish larvae (0.1), siphonophores (0.1), others (0.1).
	1100 (Eb)	2.4	14.4	18	Copepods (67.1), decapod larvae (27.4), chaetognaths (3.2), gastropods (1.1), ctenophores (0.8), siphonophores (0.3), others (0.1).

Table 4.5.10 (Contd 3)

Station (Date)	Time (h)/Tide	Biomass (mg/100 m)	Population (no./100 m)	Total groups (no)	Major group (%)
4 (09.04.06)	1300 (Eb)	2.7	34.7	16	Copepods (43.5), gastropods (16.2), decapod larvae (13.6), lamellibranchs (12.6), chaetognaths (12.1), ctenophores (0.5), siphonophores (0.4), polychaetes (0.4), appendicularians (0.3), medusae (0.20), ostracods (0.1), others (0.1).
	1500 (Eb)	1.9	5.1	14	Copepods (60.8), decapod larvae (21.9), gastropods (5.6), chaetognaths (5.0), ctenophores (4.2), foraminiferans (0.5), appendicularians (0.4), polychaetes (0.4), lamellibranchs (0.3), medusae (0.3), siphonophores (0.2), ostracods (0.2), others (0.2).
5 (10.04.06)	0900 (Fl)	3.1	17.1	16	Copepods (86.6), decapod larvae (5.4), ctenophores (2.4), polychaetes (1.6), medusae (1.4), chaetognaths (1.3), gastropods (0.4), lamellibranchs (0.4), foraminiferans (0.3), cumaceans (0.1), others (0.1).
	1100 (Fl)	2.6	15.2	14	Copepods (63.4), chaetognaths (18.8), decapod larvae (13.9), gastropods (1.3), siphonophores (1.0), ctenophores (0.6), medusae (0.4), foraminiferans (0.3), polychaetes (0.1), others (0.2).

Table 4.5.10 (Contd 4)

Station (Date)	Time (h)/Tide	Biomass (m/100 m ³)	Population (no x 10 ³ /100 m ³)	Total groups (no)	Major group (%)
5 (10.04.06)	1300 (Eb)	1.6	5.0	14	Copepods (80.7), decapod larvae (14.5), gastropods (1.8), chaetognaths (0.7), foraminiferans (0.6), appendicularians (0.3), siphonophores (0.3), ostracods (0.3), ctenophores (0.3), polychaetes (0.2), medusae (0.1), lamellibranchs (0.1), others (0.1).
	1500 (Eb)	3.5	21.1	15	Copepods (63.3), decapod larvae (14.9), chaetognaths (10.5), gastropods (9.9), ctenophores (0.5), foraminiferans (0.3), appendicularians (0.2), polychaetes (0.1), fish larvae (0.1), ostracods (0.1), others (0.1).
	1700 (Eb)	3.6	14.4	15	Copepods (60.0), decapod larvae (16.7), chaetognaths (12.9), gastropods (8.1), ctenophores (1.0), foraminiferans (0.4), medusae (0.4), siphonophores (0.3), appendicularians (0.1), others (0.1).
	2000 (FI)	7.4	27.1	19	Copepods (61.4), gastropods (15.3), ostracods (12.5), siphonophores (4.5), chaetognaths (4.5), mysids (0.4), decapod larvae (0.3), medusae (0.4), lamellibranchs (0.2), polychaetes (0.2), fish larvae (0.1), foraminiferans (0.1), ctenophores (0.1), amphipods (0.1), appendicularians (0.1), others (0.1).

Table 4.5.10 (Contd 5)

Station (Date)	Time (h)/Tide	Biomass (mg/100 m ³)	Population (no x 10 ³ /100 m ³)	Total groups (no)	Major group (%)
5 (10.04.06)	1900 (FI)	13.1	29.7	20	Copepods (41.7), gastropods (32.5), ostracods (13.9), decapod larvae (3.7), medusae (2.3), polychaetes (2.3), chaetognaths (1.4), appendicularians (1.3), mysids (0.3) fish larvae (0.1), siphonophores (0.1), ctenophores (0.1), others (0.21).
6 (05.01.06)	1200 (Eb)	7.7	14.1	19	Copepods (83.1), chaetognaths (7.1), polychaetes (6.2), decapod larvae (1.1), ctenophores (0.4), foraminiferans (0.5), lamellibranchs (0.3), medusae (0.3), mysids (0.3), appendicularians (0.3), siphonophores (0.2), gastropods (0.1), ostracods (0.1), others (0.2).
	1400 (FI)	2.5	36.3	14	Copepods (62.8), polychaetes (31.6), chaetognaths (2.5), decapod larvae (1.0), siphonophores (0.5), ctenophores (0.5), appendicularians (0.3), gastropods (0.2), ostracods (0.2), medusae (0.2), lamellibranchs (0.1), others (0.1).
	1600 (FI)	9.5	40.7	18	Copepods (45.1), decapod larvae (36.1), chaetognaths (15.3), mysids (1.5), ostracods (1.1), polychaetes (0.6), medusae (0.1), ctenophores (0.1), others (0.1).

Table 4.5.10 (Contd 6)

Station (Date)	Time (h)/Tide	Biomass (ml/100 m ³)	Population (no./10/100 m)	Total groups (no)	Major group (%)
6 (05.01.06)	1800 (FI)	2.2	10.6	17	Copepods (92.1), decapod larvae (2.3), chaetognaths (1.2), polychaetes (1.1), lamellibranchs (0.8), siphonophores (0.6), gastropods (0.5), ostracods (0.3), foraminiferans (0.3), medusae (0.3), mysids (0.2), lamellibranchs (0.1), others (0.2).
7 (09.01.06)	0800 (FI)	2.9	18.8	16	Copepods (67.4), decapod larvae (26.9), chaetognaths (2.5), gastropods (0.7), foraminiferans (0.6), siphonophores (0.2), ctenophores (0.2), medusae (0.2), ostracods (0.2), appendicularians (0.1), fish larvae (0.1), others (0.1).
	0815 (FI)	2.1	14.4	18	Copepods (71.2), decapod larvae (24.4), chaetognaths (2.4), gastropods (0.5), siphonophores (0.3), ctenophores (0.2), foraminiferans (0.2), fish larvae (0.2), polychaetes (0.2), medusae (0.1), mysids (0.1), lamellibranchs (0.1), others (0.1).

Table 4.5.10 (Contd 7)

Station (Date)	Time (h)/Tide	Biomass (ml/100 m)	Population (no. $\times 10^3$ /100 m)	Total groups (no)	Major group (%)
8 (08.01.06)	1030 (Eb)	8.1	13.3	15	Copepods (52.7), decapod larvae (15.8), chaetognaths (10.3), gastropods (10.3), ostracods (4.4), ctenophores (3.5), siphonophores (1.5), lamellibranchs (0.4), appendicularians (0.3), fish larvae (0.2), foraminiferans (0.1), medusae (0.1), polychaetes (0.1), mysids (0.1), others (0.2).
	1045 (Eb)	3.8	24.0	18	Copepods (52.6), decapod larvae (23.9), gastropods (13.1), chaetognaths (4.5), ctenophores (1.8), siphonophores (1.4), ostracods (1.4), lamellibranchs (0.5), appendicularians (0.2), fish eggs (0.2), fish larvae (0.1), polychaetes (0.1), others (0.2).
9 (08.01.06)	0930 (Eb)	2.2	19.3	13	Copepods (51.2), decapod larvae (46.2), chaetognaths (1.3), polychaetes (0.2), siphonophores (0.2), ctenophores (0.2), appendicularians (0.1), medusae (0.1), others (0.1).
	0945 (Eb)	10.6	14.7	17	Copepods (70.9), decapod larvae (20.1), gastropods (4.8), chaetognaths (1.4), ctenophores (1.2), siphonophores (0.4), fish larvae (0.4), polychaetes (0.2), medusae (0.2), foraminiferans (0.1), appendicularians (0.1), others (0.2).

Table 4.5.10 (Contd 8)

Station (Date)	Time (h)/Tide	Biomass (ml/100 m)	Population (no/10/100 m)	Total groups (no)	Major group (%)
10 (11.01.06)	1115 (Fl)	3.0	3.2	15	Copepods (64.7), gastropods (14.2), ostracods (11.0), lamellibranchs (4.7), decapod larvae (2.1), foraminiferans (1.7), chaetognaths (0.5), siphonophores (0.5), polychaetes (0.2), amphipods (0.2), others (0.1).
	1130 (Fl)	1.9	1.7	11	Copepods (80.9), ostracods (5.3), decapod larvae (5.3), foraminiferans (2.6), siphonophores (2.2), chaetognaths (1.4), gastropods (1.3), polychaetes (0.7), lamellibranchs (0.2), others (0.1).
11 (11.01.06)	1230 (Eb)	3.6	15.5	15	Copepods (52.3), decapod larvae (46.1), gastropods (0.5), chaetognaths (0.3), ostracods (0.2), lamellibranchs (0.1), medusae (0.1), siphonophores (0.1), polychaetes (0.1), fish eggs (0.1), others (0.1).
	1245 (Eb)	4.9	11.6	14	Copepods (53.6), decapod larvae (42.0), chaetognaths (1.9), gastropods (1.9), foraminiferans (0.2), fish eggs (0.21), others (0.2).

Table 4.5.10 (Contd 9)

Station (Date)	Time (h) Tide	Biomass (m/100 m)	Population (no/10 ³ /100 m)	Total groups (no)	Major group (%)
12 (11.01.06)	1315 (Eb)	4.5	5.8	13	Copepods (91.9), decapod larvae (3.5), gastropods (1.2), lamellibranchs (0.9), chaetognaths (0.8), fish eggs (0.6), siphonophores (0.3), polychaetes (0.3), foraminiferans (0.2), appendicularians (0.1), ostracods (0.1), others (0.1).
	1330 (Eb)	3.3	4.9	16	Copepods (50.7), decapod larvae (41.7), gastropods (1.6), siphonophores (1.2), polychaetes (1.0), fish eggs (0.9), lamellibranchs (0.8), chaetognaths (0.5), appendicularians (0.4), stomatopods (0.4), foraminiferans (0.3), marine insects (0.3), others (0.1).
13 (11.01.06)	1400 (Eb)	2.3	3.7	14	Copepods (51.5), decapod larvae (32.5), gastropods (7.2), fish eggs (3.6), chaetognaths (2.4), lamellibranchs (1.9), foraminiferans (0.6), fish larvae (0.2), stomatopods (0.1), others (0.2).
	1415 (Eb)	6.7	10.4	18	Copepods (45.0), decapod larvae (43.8), gastropods (4.6), lamellibranchs (2.9), fish eggs (2.3), foraminiferans (0.6), polychaetes (0.2), siphonophores (0.2), isopods (0.1), marine insects (0.1), ostracods (0.1), fish larvae (0.1), medusae (0.1), others (0.2).

Table 4.5.11 (Contd 2)

Station	Parameter	June 2003	October 2003	December 2004	May 2005	January 2006
Bocha Creek	Biomass (ml/100 m ³)	2.0-6.1 (4.3)	0.5-2.6 (1.5)	11.5-12.2 (11.9)	1.2-10.9 (5.5)	2.3-6.7 (4.5)
	Population (no $\times 10^3$ /100 m ³)	35.7-95.8 (64.4)	2.7-42.9 (22.9)	26.2-34.7 (30.4)	4.3-50.2 (19.8)	3.7-10.4 (7.0)
	Total groups (no)	15-19 (18)	11-20 (16)	18-21 (20)	11-17 (15)	14-18 (16)
	Major Group	Decapods copepods fish larvae chaetognaths	Decapods copepods medusae	Copepods decapods gastropods mysids	Decapods copepods, gastropods chaetognaths ostracods	Copepods decapods gastropods lamellibranchs fish eggs
Navinal Creek	Biomass (ml/100 m ³)	2.5-4.7 (3.3)	2.2-6.0 (3.9)	8.4-9.0 (8.7)	13.0-17.1 (15.1)	3.3-4.5 (3.9)
	Population (no $\times 10^3$ /100 m ³)	12.0-87.2 (61.7)	4.7-48.1 (28.1)	17.2-17.5 (17.3)	35.3-105.1 (70.2)	4.9-5.8 (5.3)
	Total groups (no)	15-18 (17)	12-20 (17)	16-17 (17)	14-15 (15)	13-16 (15)
	Major Group	Decapods copepods polychaetes chaetognaths fish larvae <i>Lucifer</i> sp.	Decapods copepods gastropods ostracods medusae <i>Lucifer</i> sp.	Decapods Copepods mysids gastropods appendicularia ns	Decapods copepods, mysids gastropods chaetognaths ostracods	Copepods decapods gastropods siphonophores lamellibranchs fish eggs.

Table 4.5.11 (Contd 3)

Station	Parameter	July 1998	August 1998	March 1999	September 1999	March 2000
Baradi Mata Creek	Biomass (ml/100 m ³)	-	0.1-137 (41.3)	8.4-18.8 (13.6)	-	-
	Population (no/10 ³ /100 m ³)	-	0.2-124.3 (27.23)	43.9-151.5 (97.7)	-	-
	Total groups (no)	-	7-16 (11)	10-13 (12)	-	-
	Major Group	-	Copepods decapods mysids	Mysids decapods gastropods copepods	-	-
Gulf (Mundra)	Biomass (ml/100 m ³)	7.4-38.4 (16.7)	0.4-12.7 (5.2)	1.2-124.2 (13.5)	-	0.4-8- (9.3)
	Population (no/10 ³ /100 m ³)	19.9-28.5 (29.7)	4.4-105.3 (16.9)	2.5-152.2 (34.0)	-	5.3-234.6 (4.2)
	Total groups (no)	11-13 (12)	9-13 (10)	7-18 (13)	-	6-18 (11)
	Major Group	Copepods decapods chaetognaths Acetes sp. Lucifer sp. fish larvae	Copepods decapods fish larvae Lucifer sp.	Copepods decapods	-	Copepods decapods chaetognaths

Table 4.5.11 (Contd 4)

Station	Parameter	June 2003	October 2003	December 2004	May 2005	January 2006
Baradi Mata Creek	Biomass (ml/100 m ³)	2.9-3.2 (3.1)	0.5-2.9 (1.7)	1.9-27.3 (9.5)	19.2-31.0 (24.5)	1.9-3.0 (2.5)
	Population (nox10 ³ /100 m ³)	40.9-49.7 (45.3)	3.6-6.8 (5.2)	6.5-261.3 (74.0)	67.8-136.4 (94.7)	1.7-3.2 (2.4)
	Total groups (no)	15-17 (16)	13-19 (16)	16-19 (17)	11-12 (12)	11-15 (13)
	Major Group	Decapods copepods chaetognaths fish larvae	Decapods copepods gastropods foraminiferans	Copepods decapods mysids foraminiferans	Decapods copepods lamellibranchs mysids	Copepods gastropods Ostracods decapods lamellibranch
Gulf (Mundra)	Biomass (ml/100 m ³)	0.9-9.6 (2.7)	1.1-21.8 (5.2)	3.0-23.2 (7.2)	0.8-109.9 (12.3)	2.2-13.1 (5.2)
	Population (nox10 ³ /100 m ³)	7.7-58.1 (18.7)	11.7-815 (38.1)	5.1-58.1 (20.7)	3.2-232.3 (37.4)	5.1-141.0 (30.2)
	Total groups (no)	12-18 (15)	12-17 (15)	13-19 (16)	12-18 (16)	13-21 (17)
	Major Group	Copepods decapods chaetognaths fish larvae	Copepods decapods chaetognaths	Copepods decapods chaetognaths gastropods mysids	Copepods decapods mysids chaetognaths ostracods	Copepods decapods gastropods chaetognaths

Table 4.5.11 (Contd 5)

Station	Parameter	July 1998	August 1998	March 1999	September 1999	March 2000
Kotdi Creek	Biomass (ml/100 m ³)	-	-	-	2.0-2.2 (2.1)	-
	Population (no x 10 ³ /100 m ³)	-	-	-	6.4-25.4 (15.9)	-
	Total groups (no)	-	-	-	14-16 (15)	-
	Major Group	-	-	-	Decapods copepods cladocera fish eggs mysids fish larvae	-

Table 4.5.11 (Contd 6)

Station	Parameter	June 2003	October 2003	December 2004	May 2005	January 2006
Kotdi Creek	Biomass (ml/100 m ³)	-	-	-	-	2.1-2.9 (2.5)
	Population (no x 10 ³ /100 m ³)	-	-	-	-	14.4-18.8 (16.6)
	Total groups (no)	-	-	-	-	16-18 (17)
	Major Group	-	-	-	-	Copepods
		-	-	-	-	decapods chaetognaths gastropods polychaetes foraminiferans

Table 4.5.12 : Abundance of zooplankton off Mundra/Wandh during January 2006.

FAUNAL GROUP	STATION												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Foraminiferans	+	+	+	+	+	+	+	+	+	+	+	+	+
Siphonophores	+	+	+	+	+	+	+	+	+	+	+	+	+
Medusae	+	+	+	+	+	+	+	+	+	-	+	+	+
Ctenophores	+	+	+	+	+	+	+	+	+	-	+	-	+
Chaetognaths	+	+	+	+	+	+	+	+	+	+	+	+	+
Polychaetes	+	+	+	+	+	+	+	+	+	+	+	+	+
Cladocerans	-	-	-	-	-	+	-	-	-	-	-	-	-
Ostracods	+	+	+	+	+	+	+	+	+	+	+	+	+
Copepods	+	+	+	+	+	+	+	+	+	+	+	+	+
Cumaceans	+	+	+	+	+	-	-	+	+	+	-	+	+
Amphipods	-	-	+	+	+	+	-	+	-	+	+	+	+
Mysids	+	+	-	+	+	+	+	+	-	+	-	-	-
<i>Lucifer</i> sp.	+	+	-	+	+	+	+	-	+	+	-	-	-
Decapod larvae	+	+	+	+	+	+	+	+	+	+	+	+	+
Stomatopods	+	+	-	-	+	+	-	-	+	-	-	+	+
Pteropods	+	-	-	+	-	-	-	-	-	-	-	-	-
Cephalopods	-	+	-	-	-	+	-	-	-	-	-	-	-
Gastropods	+	+	+	+	+	+	+	+	+	+	+	+	+
Lamellibranchs	+	+	+	+	+	+	+	+	+	+	+	+	+
Appendicularians	+	+	+	+	+	+	+	+	+	+	+	+	+
Fish eggs	+	+	-	+	-	+	+	+	+	-	+	+	+
Fish larvae	+	+	+	+	+	+	+	+	+	-	+	-	+
Isopods	+	-	-	-	+	+	+	-	+	-	+	-	+
<i>Acetes</i> sp.	-	-	-	+	+	+	+	-	+	-	-	-	+
Marine insects	+	+	+	+	+	-	+	-	-	+	+	+	+
Others	-	-	-	+	-	-	-	-	-	-	+	-	

(+ : Present; - : Absent)

Table 5.13 : Range and average (parenthesis) of decapod larvae, Acetes sp, Lucifer sp off Mundra/Wandh during January 2006

Station	Decapod larvae		Acetes sp		Lucifer sp	
	Counts (no/100 m ³)	Incidence (%)	Counts (no/100 m ³)	Incidence (%)	Counts (no/100 m ³)	Incidence (%)
1	2679-13006 (7843)	100	-	0	1-4 (3)	100
2	6957-8957 (7957)	100	-	0	3-3 (3)	100
3	16023-19817 (17920)	100	-	0	-	0
4	1127-10916 (5173)	100	0-6 (2)	25	2-5 (2)	50
5	80-3140 (1496)	100	1-1 (1)	28.4	1-2 (1)	56.8
6	153-14694 (3868)	100	1-7 (2)	50	1-16 (10)	75
7	3514-5060 (4287)	100	0-2 (1)	50	0-1 (1)	50
8	2092-5737 (3915)	100	-	0	-	0
9	2954-8972 (5963)	100	0-3 (2)	50	0-4 (2)	50
10	53-87 (70)	100	-	0	1-1 (1)	100
11	4853-7141 (5997)	100	-	0	-	0
12	201-2036 (1119)	100	-	0	-	0
13	1199-4547 (2873)	100	0-3 (2)	50	-	0

Table 4.5.14 : Range and average (parenthesis) of total counts (no/100 m³) - A and percentage composition -B; of decapod larvae, *Acetes* sp and *Lucifer* sp off Mundra/Wandh during 1998 -2006.

Station	Parameter	July 1998	August 1998	March 1999	March 2000	June 2003
Bocha Creek	Decapod larvae					
	A	4118-31139 (16619)	16991-95298 (46953)	1480-32912 (18859)	2677-23629 (13525)	24131-66228 (45522)
	B	16.8-83.6 (63.7)	63.7-97.8 (89.7)	8.0-51.1 (29.2)	-	67.5-76.7 (70.1)
	Percentage of incidence	100	100	100	100	100
	<i>Acetes</i> sp					
	A	11-64 (31)	12-215 (81)	12-4362 (1432)	3-1190 (318)	0-4 (2)
	B	0.02-0.9 (0.19)	0.067	-	1.4-12.9 (7.1)	0-0.01 (0.005)
	Percentage of incidence	100	100	61	100	50
	<i>Lucifer</i> sp					
	A	12-78 (25)	-	-	*1 (1)	229-820 (540)
	B	0.05-1.5 (0.2)	-	-	-	0.6-0.9 (0.9)
	Percentage of incidence	75	-	-	100	100

Table 4.5.14 (Contd 2)

Station	Parameter	October 2003	December 2004	May 2005	January 2006
Bocha Creek	Decapod larvae				
	A	2346-42467 (22228)	6014-12277 (9146)	553-21212 (10495)	1199-4547 (2873)
	B	88.1-99.2 (95.1)	-	-	-
	Percentage of incidence	100	100	100	100
	Acetes sp				
	A	0-2 (1)	0-4 (2)	0	0-3 (2)
	B	0-0.01 (0.01)	-	-	-
	Percentage of incidence	25	50	0	50
	Lucifer sp				
	A	0-49 (15)	2-6 (4)	5-733 (132)	-
	B	0-0.17 (0.06)	-	-	-
	Percentage of incidence	75	100	100	0

Table 4.5.14 (Contd 3)

Station	Parameter	July 1998	August 1998	March 1999	March 2000	June 2003
Navinal Creek	Decapod larvae					
	A	1082-26256 (17057)	1943-36810 (21394)	17-57035 (25851)	2-21953 (3992)	4135-75814 (47997)
	B	11.9-28.2 (19.9)	58.8-82.6 (69.6)	7.8-53.9 (23.2)	0.04-47.8 (17.3)	34.3-86.9 (77.8)
	Percentage of incidence	100	100	100	100	100
	Acetes sp					
	A	45-127 (84)	38-1255 (412)	4-28 (8)	0-34 (6)	-
	B	0.05-0.1 (0.08)	0.05-0.1 (1.08)	<0.01-0.5 (0.02)	0.0-0.07 (0.01)	-
	Percentage of incidence	100	75	57.0	-	-
	Lucifer sp					
	A	4-21 (6)	384-431 (380)	1-2 (1)	0-1 (1)	23-200 (117)
	B	<0.01-0.05 (0.01)	0.8-1.4 (1.08)	0.002-0.003 (<0.01)	0.0-0.2	0.2-0.23 (0.2)
	Percentage of incidence	50	100	43	-	-

Table 4.5.14 (Contd 4)

Station	Parameter	October 2003	December 2004	May 2005	January 2006
Navinal Creek	Decapod larvae				
	A	1935-31689 (18602)	9459-9874 (9667)	14682-36806 (25744)	201-2036 (1119)
	B	41.5-65.9 (66.2)	-	-	-
	Percentage of incidence	100	100	100	100
	Acetes sp				
	A	1-25 (5)	0	0	-
	B	0.003-0.2 (0.02)	-	-	-
	Percentage of incidence	71	0	0	0
	Lucifer sp				
	A	2-479 (109)	14-15 (15)	23-65 (44)	-
	B	0.03-1.4 (0.4)	-	-	-
	Percentage of incidence		100	100	0

Table 4.5.14 (Contd 5)

Station	Parameter	July 1998	August 1998	March 1999	March 2000	June 2003
Baradi Mata Creek	Decapod larvae					
	A	-	11559-21818 (16688)	10884-47273 (29079)	-	25637-44339 (34988)
	B	-	73.9-81.9 (77.9)	24.8-31.2 (28.0)	-	62.7-89.2 (77.2)
	Percentage of incidence	-	100	100	-	100
	Acetes sp					
	A	-	920-2424 (1672)	-	-	-
	B	-	6.5-8.2 (7.3)	-	-	-
	Percentage of incidence	-	100	-	-	-
	Lucifer sp					
	A	-	253-346 (299)	1-3 (2)	-	93-137 (115)
	B	-	1.1-1.8 (1.5)	<0.01-<0.1 (<0.1)	-	0.2-0.3 (0.3)
	Percentage of incidence	-	100	100	-	100

Table 4.5.14 (Contd 6)

Station	Parameter	October 2003	December 2004	May 2005	January 2006
Baradi Mata Creek	Decapod larvae				
	A		2055-101622 (44809)	62785-136214 (91517)	53-87 (70)
	B		-	-	-
	Percentage of incidence		100	100	100
	Acetes sp				
	A		0-7 (3)	0-5 (2)	53-87 (70)
	B		-	-	-
	Percentage of incidence		75	50	100
	Lucifer sp				
	A	0-1	0-2 (1)	7-14	1-1 (1)
	B	0-0.02 (0.01)	-	-	-
	Percentage of incidence	50	50	100	100

Table 4.5.14 (Contd 7)

Station	Parameter	July 1998	August 1998	March 1999	March 2000	June 2003
Gulf (Mundra)	Decapod larvae					
	A	952-2857 (235.3)	557-99441 (11566)	658-100048 (5143)	12-70870 (6638)	112-24177 (3156)
	B	4.8-12.4 (9.3)	9.2-97.4 (37.3)	4.7-47.3 (28.4)	0.01-61.4 (16.75)	0.8-47.3 (16.1)
	Percentage of incidence	100	100	100	100	100
	Acetes sp					
	A	292-952 (625)	6-1604 (292)	2-3688 (112)	0-81 (14)	0-93 (8)
	B	1.0-4.1 (2.5)	0.09-6.2 (2.3)	<0.01-5 (0.17)	0-1.4 (0.57)	0-0.2 (0.04)
	Percentage of incidence	100	91.6	80.5	53.6	75
	Lucifer sp					
	A	10-222 (107)	11-691 (240)	*1 (1)	0-12 (2)	0-78 (23)
	B	0.03-0.5 (0.3)	0.2-12.5 (2.9)	*<0.01 (<0.01)	0-0.1 (<0.01)	0-0.5 (0.28)
	Percentage of incidence	100	100	50	40	91.6

Table 4.5.14 (Contd 8)

Station	Parameter	October 2003	December 2004	May 2005	January 2006
Gulf (Mundra)	Decapod larvae				
	A	65-48801 (7423)	457-48462 (4139)	100	80-19817 (6681)
	B	0.2-81.7 (19.0)	-	-	-
	Percentage of incidence	100	100	100	100
	Acetes sp				
	A	0-262 (19)	0-6 (1)	0-9	0-7 (1)
	B	0.01-0.5 (0.07)	-	-	-
	Percentage of incidence	75	48	30	44.4
	Lucifer sp				
	A	2-301 (53)	0-12 (3)	0-415 (70)	1-16 (1)
	B	0.01-0.5 (0.13)	-	-	-
	Percentage of incidence	97.3	78.6	95	66.6

Table 4.5.14 (Contd 9)

Station	Parameter	October 2003	December 2004	May 2005	January 2006
Kotdi Creek	Decapod larvae				
	A	-	-	-	3514-5060 (4287)
	B	-	-	-	-
	Percentage of incidence	-	-	-	100
	Acetes sp				
	A	-	-	-	0-2 (1)
	B	-	-	-	-
	Percentage of incidence	-	-	-	50
	Lucifer sp				
	A	-	-	-	0-1 (1)
	B	-	-	-	-
	Percentage of incidence	-	-	-	50

Table 4.5.15: Total counts, average (parenthesis) and incidence of fish eggs and fish larvae off Mundra/Wandh during January 2006.

Station	Fish eggs		Fish larvae	
	Counts (no/100 m ³)	Frequency of occurrence	Counts (no/100 m ³)	Frequency of occurrence
1	5-9 (7)	100	6-23 (15)	100
2	2-3 (2)	100	30-38 (34)	100
3	-	0	12-22 (17)	100
4	0-4 (1)	25	5-29 (17)	100
5	-	0	0-65 (19)	71
6	4-7 (6)	50	5-10 (8)	100
7	4-7 (6)	100	1-24 (13)	100
8	2-47 (25)	100	27-28 (28)	100
9	1-1 (1)	100	10-58 (34)	100
10	-	0	-	0
11	2-18 (10)	100	-	0
12	38-45 (42)	100	-	0
13	123-240 (182)	100	7-9 (8)	100

Table 4.5.16 : Range and average (parenthesis) of total counts (no/100 m³)- A, and percentage composition –B, of fish eggs and fish larvae off Mundra/Wandh during 1998 – January 2006.

Station	Parameter	July 1998	August 1998	March 1999	March 2000	June 2003	October 2003	December 2004	May 2005	January 2006
Bocha Creek	Fish eggs									
	A	1-3 (2)	0-4 (2)	5-238 (43)	2-9 (6)	3-87 (25)	0-1 (1)	55-59 (57)	0-5 (1)	123-240 (182)
	B	<0.01-0.01 (<0.01)	0-0.1 (0.3)	<0.007-3.1 (0.31)	0.04-0.1 (0.07)	0.01-0.09 (0.03)	0.0-0.4 (0.02)	-	-	-
	Percentage of incidence	100	58.5	100	100	100	75	100	22	100
	Fish larvae									
	A	3-63 (40)	133-401 (239)	1-13 (3)	0-17 (5)	586-7427 (3251)	0-10 (5)	5-7 (6)	11-469 (102)	7-9 (8)
Navinal Creek	B	0.02-0.9 (0.21)	0.06-	-	1.4-12.9 (7.1)	0-0.01 (0.005)	0-0.01 (0.01)	-	-	-
	Percentage of incidence	100	100	100	75	100	75	100	-	100
	Fish eggs									
	A	0-1 (1)	2-18 (7)	3	0-5 (1)	0-8 (1)	0-1 (0.1)	74-86 (80)	66-240 (153)	38-45 (42)
	B	<0.01 (<0.01)	<0.1-0.06 (0.02)	0.01-0.16 (0.03)	0.0-0.07 (<0.01)	0.0-0.01 (<0.01)	0-0.01 (<0.01)	-	-	-
	Percentage of incidence	25	50	86	25	1	14	100	100	100
	Fish larvae									
	A	14-386 (119)	82-220 (138)	3-29 (8)	0-20 (5)	76-1378 (838)	2-71 (21)	0-2 (1)	43-45 (44)	-
	B	0.01-1.0 (0.26)	0.2-0.9 (0.4)	0.01-0.16 (0.03)	0-0.16 (<0.1)	0.6-2.3 (0.4)	-	-	-	-
	Percentage of incidence	100	100	71	75	100	86	50	100	0

Table 4.5.16 (Contd 2)

Station	Parameter	July 1998	August 1998	March 1999	March 2000	June 2003	October 2003	December 2004	May 2005	January 2006
Baradi Mata Creek	Fish eggs									
	A	-	0-1 (1)	-	-	-	-	1-35 (9)	-	-
	B	-	0-<0.01 (<0.01)	-	-	-	-	-	-	-
	Percentage of incidence	-	50	-	-	-	-	100	-	-
	Fish larvae									
	A	79-140 (110)	-	-	-	-	-	0-104 (15)	43-234 (120)	-
	B	0.3-0.9 (0.6)	-	-	-	-	-	-	-	-
	Percentage of incidence	-	100	-	-	-	-	62.5	100	-
Gulf (Mundra)	Fish eggs									
	A	8-21 (13)	3-56 (19)	1-60 (12)	0-27 (5)	0-11 (4)	1-41 (5)	0-188 (19)	0-38 (9)	0-47 (6)
	B	0.03-0.09 (0.05)	0.0-3 (0.16)	<0.01-0.2 (0.03)	0.0-0.36 (0.05)	0-0.1 (0.04)	<0.01-0.1 (0.02)	-	-	-
	Percentage of incidence	100	100	100	65.86	64.3	61	87	51	77.7
	Fish larvae									
	A	14-386 (119)	82-220 (138)	3-29 (8)	0-20 (5)	76-1378 (838)	2-71 (21)	0-2 (1)	43-45 (44)	0-65 (19)
	B	0.01-1.0 (0.26)	0.2-0.9 (0.4)	0.01-0.16 (0.03)	0-0.16 (<0.1)	0.6-2.3 (0.4)	-	-	-	-
	Percentage of incidence	100	100	71	75	100	86	50	100	88.8

Table 4.5.16 (Contd 3)

[illegible]

Table 4.5.17: Range and average (parenthesis) of intertidal macrobenthic fauna off Mundra/Wandh during January 2006.

Transect	Biomass (g/m ² ; wet wt.)	Population (no/m ²)	Faunal groups (no)	Major group
I	0-963.2 (92.84)	0-17952 (4052)	0-7 (3)	Polychaetes
I A	0-22.49 (5.92)	0-1760 (550)	0-3 (2)	Pelecypods, amphipods, brachyurans.
I B	0-120.20 (32.45)	0-13376 (6116)	0-6 (4)	Polychaetes
II	0-171.6 (26.29)	0-3344 (499)	0-5 (2)	Amphipods
III	0.35-79.72 (13.08)	880-11088 (523)	1-6 (3)	Pelecypods, Amphipods, Pelecypods
IV	0-11.25 (4.88)	0-5808 (1511)	0-4 (2)	Polychaetes, amphipods.
V	0-78.32 (22.86)	0-6336 (2097)	0-5 (2)	Polychaetes
VI	0.07-36.08 (13.74)	1056-14960 (6409)	2-7 (4)	Pelecypods
VII	5.84-30.27 (24.26)	2288-24464 (7201)	3-6 (3)	Polychaetes, pelecypods
Overall average	0-963.2 (28.3)	0-24464 (3218)	0-7 (3)	Polychaetes, Amphipods, Pelecypods

Table 4.5.18: Range and average (parenthesis) of intertidal macrobenthic fauna at substations off Mundra during January 2006.

Transect	Biomass (g/m ² ; wet wt.)	Population (no/m ²)	Faunal groups (no)	Major group
I HW MW LW	4.89-18.69 (9.30)	1408-5104 (3256)	2-3 (2)	Polychaetes, isopods.
	0-963.2 (240.7)	0-17952 (4499)	0-7 (2)	Amphipods, pelecypods.
	1.76-86.79 (28.53)	1584-8624 (4400)	2-6 (4)	Polychaetes
I A HW LW	3.06-22.49 (11.19)	704-1760 (792)	2-3 (3)	Pelecypods, brachyurans.
	0-1.30 (0.65)	0-528 (308)	0-3 (1)	Amphipods
I B HW LW	23.80-40.65 (31.71)	2640-13376 (9152)	3-6 (5)	Polychaetes, pelecypods.
	0-120.20 (33.20)	0-6512 (3080)	0-7 (3)	Polychaetes
II HW MW LW	-	-	-	-
	0-2.08 (1.0)	0-220 (132)	0-3 (2)	Isopods, amphipods..
	0-18-171.6 (77.88)	352-3344 (1364)	1-5 (3)	Amphipods
III HW MW LW	0.35-0.70 (0.57)	880-1408 (1100)	1-2 (1)	Isopods
	12.73-39.97 (28.35)	7392-8976 (8272)	3-4 (3)	Pelecypods
	1.94-79.72 (10.22)	1232-11088 (6314)	2-6 (5)	Polychaetes, amphipods.
IV HW MW LW	-	-	-	-
	2.82-11.25 (10.41)	1936-5808 (2992)	3-4 (3)	Polychaetes, amphipods.
	1.05-11.14 (4.23)	1408-1936 (1540)	2-4 (3)	Isopods

Table 4.5.18 (Contd 2)

Transect	Biomass (g/m ² ; wet wt.)	Population (no/m ²)	Faunal groups (no)	Major group
V	0-78.32	0-1232	0-2	Brachyurans
HW	(24.85)	(572)	(1)	
MW	0-35.60	0-4224	0-5	Polychaetes
	(14.09)	(1980)	(2)	
LW	6.68-54.51	880-6336	1-5	Polychaetes
	(28.84)	(3740)	(3)	
VI	6.42-27.13	5456-14960	3-4	Pelecypods, isopods.
HW	(13.90)	(11132)	(4)	
MW	4.43-30.55	4400-11792	2-6	Pelecypods
	(14.46)	(5720)	(3)	
LW	0.07-36.08	1056-3520	3-7	Amphipods, cumaceans.
	(12.87)	(2376)	(4)	
VII	5.84-63.71	2640-4224	3-4	Brachyurans, polychaetes.
HW	(24.38)	(3388)	(4)	
MW	16.39-30.98	6336-24464	3-4	Pelecypods.
	(19.72)	(12936)	(4)	
LW	26.21-30.27	2288-10560	3-6	Pelecypods, polychaetes.
	(28.68)	(5280)	(4)	
Overall Average	0-1063.68 (26.50)	0-244464 (4865)	0-7 (3)	Polychaetes, pelecypods, amphipods.

Table 4.5.19 (Contd 2)

Station	Parameters	July 1998	March 1999	March 2000	June 2003	October 2003	December 2004	May 2005	January 2006
Kotdi Creek	Biomass (g/m ²)	-	-	-	-	-	-	-	0-78.32 (22.86)
	Population (nox10 ³ /m ²)	-	-	-	-	-	-	-	0-6.3 (2.1)
	Total groups (no)	-	-	-	-	-	-	-	0-5 (2)
	MG*	-	-	-	-	-	-	-	Polychaetes

* MG- Major Group

Table 4.5.20 : Distribution of intertidal macrofauna off Mundra/Wandh during 1998 to 2006.

Faunal groups	Station													
	1			1A		1B		2			3			
	Hw	Mw	Lw	Hw	Lw	Hw	Lw	Hw	Mw	Lw	Hw	Mw	Lw	
Anthozoans	-	+	-	-	-	-	-	NIL	-	-	-	-	-	
Gastropods	-	+	+	+	+	+	+		-	+	-	-	+	
Pelecypods	+	+	+	+	-	+	+		+	-	-	+	-	
Polychaetes	+	+	+	-	-	+	+		-	+	-	+	+	
Cumaceans	-	-	+	-	-	-	+		-	+	-	-	-	
Isopods	+	-	-	+	-	+	+		+	+	+	-	+	
Amphipods	+	+	+	-	+	+	+		+	+	+	+	+	
Bracyurans	-	+	+	+	+	+	+		+	-	-	+	-	
Ophiuroids	-	-	-	-	-	-	-		-	-	-	-	-	
Miscellaneous	-	+	-	-	-	-	+		+	-	-	-	+	

Table 4.5.20 (Contd 2)

Faunal groups	Station											
	4			5			6			7		
	Hw	Mw	Lw	Hw	Mw	Lw	Hw	Mw	Lw	Hw	Mw	Lw
Anthozoans	NIL ↓ ↑	-	-	-	-	-	-	-	-	-	-	-
Gastropods		+	-	-	-	-	+	+	-	-	+	-
Pelecypods		+	+	-	+	+	+	+	+	+	+	+
Polychaetes		+	+	-	+	+	+	+	+	+	+	+
Cumaceans		-	-	-	-	-	+	+	+	-	-	-
Isopods		+	+	-	+	+	+	+	+	+	-	-
Amphipods		+	+	-	+	+	+	+	+	-	+	+
Bracyurans		+	-	+	-	+	+	+	-	+	-	+
Ophiuroids		-	-	-	-	-	-	-	-	-	+	-
Miscellaneous		-	-	-	-	-	-	-	-	-	-	-

(+) Present; (-) Absent

Table 4.5.21: Range and average (parenthesis) of subtidal macrobenthic fauna off Mundra/Wandh during January 2006.

Subtidal	Biomass (g/m ² wet wt.)	Population (no/m ²)	Faunal groups (no)	Major group
1	0.15-0.70 (0.39)	125-650 (325)	1-3 (2)	Polychaetes
2	0-2.25 (0.57)	0-2900 (731)	0-8 (2)	Amphipods
3	Hard substratum			
4	0.6-2.07 (1.26)	500-1050 (775)	2-10 (4)	Amphipods pelecypods
5	0.09-3.36 (1.0)	150-1575 (744)	3-8 (5)	Amphipods polychaetes
6	Hard substratum			
7	0.31-0.75 (0.56)	350-725 (450)	4-6 (5)	Polychaetes, pelecypods
8	0-1.57 (0.74)	0-2275 (925)	0-6 (4)	Amphipods polychaetes
9	0-0.25 (0.07)	0-175 (75)	0-2 (1)	Polychaetes
10	0.03-4.08 (1.83)	50-575 (338)	2-3 (3)	Polychaetes
11	0.47	100	3	Pelecypods
12	0.03-15.03 (3.81)	50-2075 (669)	1-6 (3)	Polychaetes, amphipods
13	0-3.10 (1.59)	0-2075 (938)	0-7 (3)	Polychaetes pelecypods
Overall average	0-15.03 (1.11)	0-2900 (552)	0-10 (3)	Polychaetes, amphipods

Table 4.5.22 : Standing stock of subtidal macrobenthos off MundraWandh during 1998 –2006.

Station	Parameter	July 1998	March 1999	September 1999	March 2000
Bocha Creek	Biomass (g/m ² , wet wt)	0.5-0.7 (0.6)	0.5-1.2 (0.9)	-	1.0-1.8 (0.9)
	Population (no)	200-700 (500)	1125-1200 (1177)	-	140-300 (214)
	Total groups (no)	1-2 2	3-6 (5)	-	2-3 (3)
	Major Group	Polychaetes	Polychaetes macrurans	-	Polychaetes
Naval Creek	Biomass (g/m ² , wet wt)	0.1-5.1 (2.6)	29.2-63.1 (46.2)	-	0-0.18 (0.1)
	Population (no)	140-1900 (1030)	8000-17700 (12800)	-	0-1502 (751)
	Total groups (no)	1-6 (4)	7-7 (7)	-	3-3 (3)
	Major Group	Polychaetes	Macrurans, polychaetes, brachyurans, copepods, isopods.	-	Polychaetes, amphipods, brachyurans.
Baradi Matha Creek	Biomass (g/m ² , wet wt)	-	-	-	-
	Population (no/m ²)	-	-	-	-
	Total groups (no)	-	-	-	-
	Major Group	-	-	-	-

Table 4.5.22 (Contd 2)

Station	Parameter	June 2003	October 2003	December 2004	May 2005	January 2006
Bocha Creek	Biomass (g/m ² , wet wt)	0.5-7.1 (3.1)	0.02-4.0 (1.1)	1.1-3.2 (2.0)	0.1-1.9 (0.7)	0-3.10 (1.59)
	Population (no/m ²)	430-1400 (800)	30-950 (440)	1500-4300 (2300)	200-900 (500)	0-2075 (938)
	Total groups (no)	1-4 (2)	1-4 (2)	3-4 (3)	2-3 (3)	0-7 (3)
	Major Group	Polychaetes	Polychaetes	Polychaetes, nemertines.	Polychaetes, Amphipods.	Polychaetes, pelecypods.
Navinal Creek	Biomass (g/m ² , wet wt)	0.0-16.13 (4.0)	0-5.0 (0.6)	0.2-1.8 (1.0)	0.9-28.4 (16.4)	<0.1-15.03 (3.81)
	Population (no/m ²)	0-580 (160)	0-500 (110)	400-1200 (700)	1000-3200 (2400)	50-2075 (669)
	Total groups (no)	0-4 (2)	0-4 (2)	3-5 (4)	1-2 (2)	1-6 (3)
	Major Group	Polychaetes, brachyurans.	Polychaetes	Nemertines amphipods.	Polychaetes, isopods.	Polychaetes, amphipods.
Baradi Matha Creek	Biomass (g/m ² , wet wt)	-	-	0.4-42.8 (9.9)	0.4-3.8 (2.2)	<0.1-4.08 (1.83)
	Population (no/m ²)	-	-	200-170 (800)	200-1700 (700)	50-575 (338)
	Total groups (no)	-	-	2-6 (4)	1-3 (2)	2-3 (3)
	Major Group	-	-	Amphipods, isopods.	Polychaetes.	Polychaetes.

Table 4.5.22 (Contd 3)

Station	Parameter	July 1998	March 1999	September 1999	March 2000
Gulf (Mundra)	Biomass (g/m ² , wet wt)	0.5	0.2-46.3 (13.3)	-	0.5-11.5 (4.3)
	Population (no)	470	12-78600 (20000)	-	300-173300 (44920)
	Total groups (no)	3	4-7 (6)	-	4-7 (6)
	Major Group	Polychaetes	Polychaetes, amphipods, pelecypods.	-	Polychaetes, amphipods, pelecypods.
Kotdi Creek	Biomass (g/m ² , wet wt)	-	-	1.2	-
	Population (no)	-	-	17176	-
	Total groups (no)	-	-	4	-
	Major Group	-	-	Polychaetes, cumaceans, isopods, pelecypods.	-

Table 4.5.22 (Contd 4)

Station	Parameter	June 2003	October 2003	December 2004	May 2005	January 2006
Gulf (Mundra)	Biomass (g/m ² , wet wt)	0.0-4.47 (0.42)	0.0-6.01 (1.36)	<0.1-13.1 (1.6)	0.0-9.2 (1.0)	0-3.36 (0.5)
	Population (no)	0-1300 (240)	0-1200 (290)	100-1800 (500)	0-600 (200)	0-2900 (408)
	Total groups (no)	0-4 (2)	0-4 (2)	1-4 (3)	0-4 (2)	0-10 (3)
	Major Group	Polychaetes, amphipods.	Polychaetes	Polychaetes, amphipods.	Polychaetes, amphipods.	Polychaetes, amphipods, pelecypods.
Kotdi Creek	Biomass (g/m ² , wet wt)	-	-	-	-	0.31-0.75 (0.56)
	Population (no)	-	-	-	-	350-725 (450)
	Total groups (no)	-	-	-	-	4-6 (5)
	Major Group	-	-	-	-	Polychaetes, pelecypods.

Table 4.5.23 : Distribution of subtidal macrofauna off Mundra/Wandh during January 2006.

Faunal group	Station												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Nematodes	-	+		+	-		-	+	-	-	-	-	-
Chaetognaths	+	-		-	-		-	-	-	-	-	-	-
Gastropods	-	-		-	-		-	+	-	-	-	-	-
Pelecypods	+	+		+	+		+	+	-	+	+	+	+
Polychaetes	+	+		+	+		+	+	+	+	-	+	+
Pycnogonids	-	-		+	+		-	-	-	+	-	+	-
Ostracods	-	+		+	+		+	-	+	-	-	+	-
Copepods	-	-		-	+		-	-	-	-	+	-	-
Cumaceans	+	+		+	+		-	+	-	+	-	+	+
Tanaidaceans	-	+		+	+		+	+	-	+	-	+	-
Isopods	-	-		-	-		+	+	-	-	-	+	+
Amphipods	+	+		+	+		+	+	+	+	+	+	+
Decapod larvae	-	-		-	+		-	-	-	-	-	-	-
Brachyurans	-	+		+	+		+	-	-	-	-	-	+
Ophiuroids	-	-		-	-		-	-	-	+	-	+	+
Unidentified	-	-		+	+		-	-	-	-	-	-	-

(+) Present; (-) Absent

Table 4.5.24 : Marine fish landings (t x10³/y) of Gujarat State and districts adjoining the Gulf.

Year	State	Jamnagar	Rajkot	Kachchh	Total contribution By districts (%)
1965-66	109.9	4.2	--	2.4	6.0
1966-67	115.2	2.8	--	3.0	5.0
1967-68	124.9	3.8	--	3.3	5.7
1968-69	131.7	2.8	--	2.3	3.8
1969-70	140.0	2.9	--	2.7	4.0
1970-71	151.2	4.7	--	3.9	5.7
1971-72	147.0	5.5	--	4.1	6.5
1972-73	151.2	4.6	--	4.8	6.2
1973-74	177.6	6.8	--	6.9	7.7
1974-75	157.4	3.0	0.3	4.3	4.8
1975-76	208.3	5.1	2.2	3.8	5.3
1976-77	225.4	21.7	1.3	5.4	12.6
1977-78	176.9	14.5	0.4	6.3	12.0
1978-79	230.0	21.8	2.7	6.3	13.4
1979-80	206.7	24.8	0.6	5.7	15.0
1980-81	218.9	32.3	1.7	4.4	17.5
1981-82	220.6	34.2	2.0	6.3	19.3
1982-83	192.7	29.7	0.5	13.8	22.8
1983-84	223.3	27.4	1.3	23.3	17.3
1984-85	290.7	31.5	0.7	34.3	22.9
1985-86	306.6	25.2	1.7	35.4	20.3
1986-87	315.9	28.0	0.5	31.3	18.9
1987-88	327.6	40.2	0.5	29.7	21.5
1988-89	414.1	44.2	2.8	46.9	22.7
1989-90	432.4	45.4	2.5	49.6	22.5
1990-91	500.5	54.3	1.8	65.4	24.3
1991-92	530.0	63.5	2.7	61.8	24.1
1992-93	609.1	66.2	1.1	63.0	21.4
1993-94	619.8	58.9	1.5	63.2	19.9
1994-95	645.3	58.9	1.5	76.8	21.0
1995-96	598.4	68.1	1.0	72.6	23.7
1996-97	660.1	76.2	0.9	76.7	23.3
1997-98	702.4	56.0	0.8	71.8	18.3
1998-99	551.7	28.6	0.2	69.7	17.9
1999-00	671.0	71.7	0.8	75.0	22.0
2000-01	620.5	72.6	1.7	64.7	22.4
2001-02	650.8	83.4	2.1	80.0	25.4
2002-03	743.4	102.8	1.5	80.7	24.9
2003-04	609.1	37.9	1.7	72.0	18.3
2004-05	585.0	45.9	1.9	64.7	19.2

Source: Department of Fisheries, Government of Gujarat

Table 4.5.25 : Composition of marine fish landings (t/y) of Kachchh District during 1997-98, 1998-99, 2000-01, 2002-03 and 2004-05.

Name of fish	1997-98	1998-99	2000-01	2002-03	2003-04	2004-05
White pomfret	1110	801	924	1022.4	1103.9	725.3
Black pomfret	35	33	140	45.5	74.9	77.3
Bombay duck	15011	12354	13547	14152.0	12264.2	10021.4
Thread fin	737	944	351	1331.9	1048.5	380.5
Jew fish	1124	1372	520	1780.4	1496.0	802.1
Hilsa	225	208	142	221.9	181.2	36.9
Other clupeids	2116	1762	1947	2242.2	2380.0	2240.8
Coilia	5603	6028	3829	5801.2	5088.2	6117.8
Shark	3415	2686	2118	3817.7	2986.1	1629.6
Mullet	2132	1864	878	786.9	1361.9	1348.7
Cat fish	1367	1782	1030	2428.6	1896.2	1476.3
Eel	79	134	153	236.5	146.0	299.0
Leather jacket	113	88	144	161.8	93.6	158.9
Seer fish	238	406	192	345.5	421.3	316.1
Indian salmon	201	329	158	223.8	149.1	241.4
Ribbon fish	3294	1950	2556	3076.9	2964.4	2601.2
Silver bar	518	453	528	796.9	1324.3	1517.6
Perches	254	215	298	728	409.3	408.9
Small scienides	23848	26742	22685	4432.0	4435.6	4545.7
Shrimp	4810	5512	5008	6659.1	6351.2	5364.3
Prawns (medium)	1732	1302	1260	1226.3	1631.9	780.1
Prawns (Jumbo)	166	191	372	239.7	292.8	215.8
Lobster	33	43	88	120.1	49.0	23.1
Crabs	140	42	229	40.6	37.0	44.2
Levta	1	0	20	0.4	-	-
Squid fish	22	14	38	22.1	19.0	18.1
Others	3463	2429	5541	28778.7	22789.9	23162.3
Total	71787	69685	64696	80714.3	71995	64680.2

Source: Department of Fisheries, Government of Gujarat

Table 4.5.26 : Monthwise composition of marine fish landings (t) of Kachchh District during 2002-03.

Name of fish	April 02	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan 03	Feb	Mar	Total
White pomfret	74.5	74.5	-	-	0.8	192.3	79.0	104.6	136.8	99.2	93.9	96.6	952.0
Black pomfret	5.3	-	-	-	-	4.0	3.6	7.7	5.5	15.7	1.8	1.8	45.5
Bombay duck	844.5	1009.0	-	-	-	93.2	1429.6	3101.3	2527.7	2606.5	2047.9	1146.9	14806.5
Thread fin	237.2	47.4	-	-	-	22.1	29.0	66.4	109.2	160.5	226.6	404.8	1301.2
Jew fish	245.8	44.2	-	-	1.7	48.6	103.3	108.5	150.4	302.8	321.7	417.7	1744.6
Hilsa	11.2	-	-	-	-	8.6	18.1	26.1	32.9	30.6	50.1	44.2	221.9
Other clupeids	140.3	67.7	0.7	-	17.2	87.6	154.7	450.4	313.4	182.5	182.8	677.5	2274.9
Coilia	260.1	424.5	-	-	2.2	60.7	412.3	1139.0	1004.0	1165.1	1095.8	514.6	6078.3
Shark	294.2	42.4	0.2	-	20.5	133.6	261.3	590.9	689.7	889.8	450.9	425.1	3798.5
Mullet	61.5	47.1	6.3	-	74.8	125.5	125.2	95.6	54.7	92.2	40.6	55.0	778.4
Cat fish	257.0	95.5	1.7	-	24.5	93.8	175.4	253.5	224.7	387.2	273.4	701.8	2445.3
Eel	32.1	-	-	-	-	0.6	13.5	43.8	50.0	27.4	44.6	24.6	236.5
Leather jacket	5.3	-	-	-	-	9.5	19.8	20.9	26.4	43.2	16.7	20.0	161.8
Seer fish	15.6	-	-	-	-	23.6	54.4	61.2	64.5	51.1	46.6	28.5	345.5
Indian salmon	8.9	4.7	-	-	-	17.1	30.4	28.3	32.1	34.9	39.8	27.6	223.8

Table 4.5.26 (Contd 2)

Name of fish	April 97	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan 98	Feb	Mar	Total
Ribbon fish	203.7	-	-	-	2.1	100.6	169.1	590.7	618.7	641.0	510.1	241.4	3077.3
Silver bar	143.0	90.4	0.1	-	0.2	18.1	83.7	85.6	71.0	85.3	96.9	185.2	859.5
Perches	24.7	14.0	-	-	0.5	32.8	263.0	105.9	112.5	58.1	71.0	45.5	728.0
Small scienides	308.8	32.7	-	-	5.8	496.1	399.7	691.8	794.8	541.3	706.3	447.1	4424.5
Shrimps	454.5	206.7	1.0	-	16.7	540.5	532.8	1132.7	1161.5	1051.4	1010.1	689.7	6797.5
Prawns (medium)	144.6	48.9	1.6	-	1.7	158.4	67.2	190.6	230.3	105.3	181.2	114.2	1243.9
Prawns (jumbo)	11.1	-	-	-	0.2	29.8	12.0	36.9	34.6	63.7	30.3	21.3	239.7
Lobster	2.0	-	-	-	-	7.4	22.5	25.6	24.0	16.7	12.1	9.7	120.1
Crabs	14.8	0.2	-	-	-	2.1	3.9	5.1	5.1	3.4	3.5	2.5	40.6
Levta	0.4	-	-	-	-	-	-	-	-	-	-	-	0.4
Squid fish	1.2	-	-	-	-	1.4	2.3	3.7	4.3	4.2	3.2	1.7	22.1
Miscellaneous	2047.9	83.3	2.9	-	23.3	1790.3	2560.4	4713.3	5359.9	4619.5	4622.0	2988.4	28811.2
Total	5849.9	2333.0	14.4	-	192.2	4098.1	6981.2	13679.8	13838.5	13278.7	12980.1	933.4	81779.4

Source : Department of Fisheries, Government of Gujarat

Table 4.5.27 : Marine fish landings ($t \times 10^3/y$) of Kachchh District and its comparison with the landing at Mundra.

Year	Kachchh District	Mundra	Percentage of district landings
1991-92	61.8	2.4	3.9
1992-93	63.0	0.4	0.6
1993-94	63.2	0.8	1.2
1994-95	76.8	0.6	0.8
1995-96	72.7	2.7	3.8
1996-97	76.7	-	-
1997-98	71.8	1.3	1.8
1998-99	69.7	1.7	2.4
1999-00	75.0	-	-
2000-01	64.7	0.4	0.6
2001-02	80.2	1.4	1.7
2002-03	81.8	1.6	2.0
2003-04	72.1	1.6	2.2
2004-05	64.7	1.6	2.5

Source : Department of fisheries, Government of Gujarat

Table 4.5.28 : Composition of marine fish landings (t/y) at Mundra/wandh during 1994-2003

Name of fish	94-95	95-96	97-98	2000-01	01-02	02-03
White pomfret	19.2	68.4	18.0	10.5	11.5	15.8
Black pomfret	3.3	13.0	-	-	-	2.5
Bombay duck	205.1	1040.0	540.5	122.6	602.7	737.5
Jew fish	14.8	43.3	6.2	-	13.2	36.9
Other clupeids	--	--	9.3	19.3	9.1	18.1
Coilia	171.3	549.4	323.3	52.7	219.0	292.5
Shark	12.7	25.4	6.3	8.5	32.9	42.2
Mullet	17.2	--	24.9	17.5	5.0	19.0
Cat fish	9.0	9.6	11.9	23.7	68.6	80.7
Eel	--	--	--	-	2.3	-
Leather jacket	--	--	2.2	-	1.8	2.5
Seer fish	7.1	14.1	12.7	4.0	12.1	21.1
Ribbon fish	2.1	--	3.3	10.6	6.5	24.3
Silver bar	2.6	6.9	5.6	2.3	19.4	47.6
Small sciaenids	7.3	5.5	13.2	3.8	7.9	2.4
Prawns (medium)	13.9	6.6	10.0	24.2	208.8	132.2
Lobster	--	0.5	1.1	1.9	2.9	-
Crabs	8.5	1.0	0.9	3.1	-	-
Levta	--	1.8	--	-	-	-
Others	73.8	212.5	227.4	47.3	158.2	170.0
Total	623.5	2730.4	1263.9	351.7	1381.6	1645.3

Source : Department of fisheries, Government of Gujarat

Table 4.5.29 : Monthwise composition of marine fish landings (t) at Mundra during 2002-03.

Name of fish	April 02	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan 03	Feb	Mar	Total
White pomfret	-	-	-	-	-	4.8	1.8	4.0	1.3	3.0	-	1.0	15.8
Bombay duck	34.5	22.0	-	-	-	43.3	70.2	222.8	30.1	229.3	50.4	34.9	737.5
Jew fish	5.7	-	-	-	-	6.0	7.5	-	-	17.6	-	-	36.9
Other clupeids	-	-	-	-	1.0	-	3.0	8.1	-	4.2	-	1.9	18.1
Coilia	21.8	17.1	-	-	-	16.2	48.2	60.8	16.3	73.1	33.6	5.4	292.5
Shark	10.3	8.8	-	-	0.3	3.5	5.4	5.7	-	7.1	-	1.1	42.2
Mullet	-	-	0.4	-	2.1	1.7	7.7	4.6	-	2.5	-	-	19.0
Catfish	9.7	7.8	0.2	-	0.4	5.2	5.6	9.5	16.7	10.6	12.6	2.3	80.7
Leather jacket	2.5	-	-	-	-	-	-	-	-	-	-	-	2.5
Seer fish	-	-	-	-	-	5.2	4.6	2.2	7.6	1.5	-	-	21.1
Ribbon fish	-	-	-	-	-	2.2	2.2	10.8	-	5.9	-	3.3	24.3
Silver bar	6.2	4.9	-	-	-	2.2	2.2	4.9	5.4	7.9	12.6	1.4	47.6
Small scienides	-	-	-	-	-	-	2.4	-	-	-	-	-	2.4
Shrimps	-	-	-	-	1.2	5.6	7.1	4.1	-	4.4	-	2.8	25.1
Prawns (medium)	29.2	17.6	0.2	-	-	-	0.8	1.4	40.2	1.0	42.0	-	132.1
Lobster	-	-	-	-	-	-	-	-	-	-	-	-	-
Crabs	-	-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous	19.5	11.8	0.3	-	1.1	22.5	20.4	12.2	20.0	13.8	21.0	4.8	147.5
Total	139.5	90.1	1.1	-	6.1	118.4	189.1	350.7	137.7	381.8	172.2	58.6	1645.3

Source : Department of Fisheries, Government of Gujarat

Table 4.5.30 : Composition of marine fish landings (t) around Mundra during 2002-03.

Name of fish	Navinal	Jarpara	Mundra	ChenKhedia	Luni	Bhadreshwar	Kukadasar
White pomfret	6.6	3.7	15.8	-	23.4	48.8	8.7
Black pomfret	-	-	2.5	-	-	0.3	-
Bombay duck	394.2	89.6	737.5	-	538.5	559.0	582.8
Thread fin	-	-	-	-	-	15.4	-
Jew fish	34.0	7.8	36.9	-	16.3	20.5	18.8
Hilsa	0.1	9.7	4.2	-	15.1	-	10.3
Other clupeids	24.2	17.6	18.1	29.6	56.0	90.3	17.8
Coilia	159.7	81.0	292.4	14.9	210.7	206.7	208.1
Shark	22.2	32.7	42.2	14.0	41.5	247.3	28.0
Mullet	30.0	12.6	19.0	80.4	45.2	8.4	10.1
Cat fish	35.7	51.2	80.7	23.8	66.1	65.1	63.5
Eel	1.7	-	-	-	-	-	1.0
Seer fish	9.3	3.0	21.1	-	13.3	0.8	21.7
Indian salmon	6.1	8.7	11.4	-	6.7	-	8.4

Table 4.5.30 (Contd 2)

Name of fish	Navinal	Jarpara	Mundra	Chenkheddia	Luni	Bhadreshwar	Kukadasar
Ribbon fish	13.1	4.4	24.3	-	42.0	57.7	9.1
Silver bar	17.0	5.9	47.6	1.4	29.8	2.7	23.3
Perches	-	-	-	-	-	1.4	-
Small sciaenids	7.2	5.7	2.4	1.0	88.2	167.6	2.0
Shrimps	30.7	24.8	25.1	27.4	91.1	142.3	51.8
Prawns (medium)	1.4	47.0	132.2	0.4	14.5	16.3	113.2
Prawn (Jumbo)	-	-	-	-	-	-	29.8
Lobster	-	1.2	-	-	-	-	2.8
Crabs	-	-	-	2.4	2.2	7.8	-
Miscellaneous	-	125.0	132.0	44.3	183.8	188.6	120.7
Total	843.9	531.9	1645.3	239.5	1489.4	1618.7	1220.4

Source : Department of Fisheries, Government of Gujarat

Table 4.5.31 : Monthwise marine fish landings (t) around Mundra during 2002-03.

Landing centre	April 02	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan 03	Feb	Mar	Total
Navinal	41.4	3.0	1.2	-	3.0	15.0	80.5	96.0	108.3	369.4	72.0	54.0	843.9
Jarpara	163.4	-	1.3	-	5.7	1.0	23.8	21.1	57.4	74.0	45.5	138.9	532.0
Mundra	139.5	90.1	1.1	-	6.0	118.4	189.0	350.7	137.7	381.8	172.2	58.6	1645.3
Chenkhedia	21.2	4.8	2.0	-	9.9	30.0	52.6	26.0	14.9	35.2	20.7	22.9	239.5
Luni	111.6	17.0	1.4	-	6.5	85.0	196.2	135.0	178.1	305.5	301.3	152.0	1489.4
Bhadreshwar	86.5	12.5	2.0	-	7.7	76.7	415.3	255.8	114.8	156.2	223.4	267.8	1618.7
Kukadasar	90.3	201.4	-	-	-	2.8	439.3	172.4	129.0	129.1	103.0	73.8	1220.4

Source: Department of fisheries, Government of Gujarat

Table 4.5.32 : Districtwise fishing villages, fishermen, boats and fishing gears (2003) of Kachchh District.

Parameter	
Length of coast line (km)	406
Percentage of the state of the coast line	25.4
Fishing villages/cities (no)	73
Fishermen families (no)	3650
Total fishermen population (no)	18664
Active fishermen (no)	10615
Fishing boats (mechanised) (no)	1219
Fishing boats (non-mechanised) (no)	291
Total fishing gears (nets) (no)	25917
Trawlers (no)	11
Gill netters (no)	188
Others (no)	1019

Source : Department of Fisheries, Government of Gujarat.

Table 4.5.33: Villagewise fishermen, boats and fishing gears around Mundra.

Village	Total fishermen			Fishing boats		
	Families	Gents	Ladies	Total	Mechanised	Non-mechanised
Navinal	22	62	53	115	9	-
Jarpara	101	307	278	585	20	-
Dharab	16	54	47	101	-	-
Mundra	71	180	146	326	80	-
Chenkheddia	74	248	230	478	24	-
Luni	227	619	660	1279	65	1
Bhadreshwar	194	541	554	1095	95	-
Total	705	2011	1968	3979	293	1
						294

Source: Department of Fisheries, Government of Gujarat.

Table 4.5.34 : Species composition of fish catch off Mundra during January 2006.

Station/ (Date)	Time(h)/ (Tide)	Catch kg/hr	Total species (no)	Common species
3 (07.01.06)	0800 (Fl)	14.5	F-12 P-3 O-3	Fishes : <i>Coilia dussumieri</i>, <i>Johnius glaucus</i>, <i>Polynemus heptadactylus</i>, <i>Otolithes</i> sp, <i>Harpadon nehereus</i>, <i>Thryssa hamiltoni</i>, <i>Arius caelatus</i>, <i>Scolidon laticaudus</i>, <i>Pampus argenteus</i>, <i>Ilisha</i> sp., <i>Otolithes brunneus</i> (biaurates), <i>Pampus chinensis</i>. Prawn : <i>Parapenaeopsis sculptilis</i>, <i>Exopalaemon styliferus</i>, <i>Exhippolysmata ensirostris</i>. Others : <i>Neptunes pelagicus</i>, <i>Charybdis annulata</i>, <i>Squilla</i>.
6 (05.01.06)	1100 (Eb)	8.0	F-11 P-4 O-3	Fishes : <i>Harpadon nehereus</i>, <i>Coilia dussumieri</i>, <i>Pampus argenteus</i>, <i>Arius caelatus</i>, <i>Sillago sihama</i>, <i>Lepturacanthus savala</i>, <i>Johnius glaucus</i>, <i>Terapon theraps</i>, <i>Secutor insidictor</i>, <i>Hilsa kelee</i>, <i>Otolithes</i> sp. Prawn : <i>Metapenaeus dobsoni</i>, <i>Exopalaemon ensirostris</i>, <i>Metapenaeus</i> sp, <i>Penaeus</i> sp. Others : <i>Neptunes pelagicus</i>, <i>Loigo</i>, <i>Squilla</i>.
9 (08.01.06)	0930 (Eb)	18.5	F-13 P-3 O-4	Fishes : <i>Mugil</i> sp, <i>Scomberomorus guttatus</i>, <i>Otolithes</i> sp, <i>Ilisha</i> sp, <i>megalopectera</i>, <i>Mugil cephalus</i>, <i>Coilia dussumieri</i>, <i>Thryssa</i> sp. Prawns : <i>Penaeus indicus</i>, <i>Parapenaeopsis sculptilis</i>, <i>Metapenaeus</i> sp. Others : <i>Matuta planipes</i>, <i>Charybdis cruciata</i>, <i>Squilla</i>.

Table 4.5.34 (Contd 2)

Station/ (Date)	Time(h) (Tide)	Catch kg/hr	Total species (no)	Common species
2 (31.12.04)	1115 (Eb)	2.2	F-6 P-2 O-2	Fishes : <i>Coilia dussumieri</i>, <i>Harpadon nehereus</i>, <i>Pampus argenteus</i>, <i>Polynemus heptadactylus</i>, <i>Lepturacanthus savala</i>, <i>Sillago sihama</i>, <i>Arius caelatus</i>, <i>Hilsa</i> sp, <i>Ilisha</i> sp, <i>Johnius glaucus</i>, <i>Saurida tumbil</i>, <i>Thryssa mystac</i>, <i>Cynoglossus arel</i>. Prawns : <i>Exopalaemon styliferus</i>, <i>Exhippolydata ensirostris</i>, <i>Parapenaeopsis</i> sp., Others : <i>Charybdis annulata</i>, <i>Charybdis cruciata</i>, <i>Loligo</i>, <i>Squilla</i>.

Table 4.5.35: Comparison of fish catch off Mundra during 1998 to 2005.

Period/Parameter	Navinal Creek	Bocha Creek	Gulf
July 1998			
i) Total catch (kg/h)	15.5	-	-
ii) Total species (no)	F - 8; P - 1; O - 1.	-	-
iii) Major species	Fishes: <i>Acanthopagrus</i> sp, <i>Mugil cephalus</i> , <i>Eleutheronema</i> <i>tetradactylum</i> , <i>Secutor insidiator</i> , <i>Crenidens crenidens</i> . Prawns: <i>Penaeus indicus</i> Others : <i>Charybdis annulata</i>	-	-
March 1999			
i) Total catch (kg/h)	8.5	-	17.3
ii) Total species (no)	F - 6; P - 2; O - 1.	-	F - 7; P - 3; O - 1.
iii) Major species	Fishes: <i>Mugil</i> sp, <i>Thryssa dussumieri</i> , <i>Harpadon nehereus</i> , <i>Johnius</i> sp, <i>Otolithoides biauritus</i> . Prawns: <i>Parapenaeopsis sculptilis</i> , <i>Penaeus</i> sp. Others : Crabs	-	Fishes: <i>Scoliodon laticaudatus</i> , <i>Harpadon nehereus</i> , <i>Coilia dussumieri</i> , <i>Lepturacanthus savala</i> , <i>Pampus argenteus</i> , <i>Arius</i> sp, <i>Otolithoides biauritus</i> . Prawns: <i>Parapenaeopsis sculptilis</i> <i>Parapenaeopsis</i> <i>Stylifera</i> , <i>Penaeus</i> sp. Others : Crabs Others : <i>Matuta planipes</i>

Table 4.5.35 (Contd 2)

Period/Parameter	Naval Creek	Bocha Creek	Gulf
March 2000 i) Total catch (kg/h) ii) Total species (no) iii) Major species	10.0 F - 12; P - 6; O - 1. Fishes: <i>Pampus argenteus</i> , <i>Harpadon nehereus</i> , <i>Otolithes</i> sp., <i>Ilisha</i> sp., <i>Coilia dussumieri</i> , <i>Cynoglossus arel</i> , <i>Johnius glaucus</i> , <i>Thyssa vitirostris</i> . Prawns: <i>Parapenaeopsis sculptilis</i> , <i>Metapenaeus brevicornis</i> , <i>Solenocera crassicornis</i> , <i>Exhippolysmata</i> sp. Others : <i>Charybdis annulata</i> .	- - -	22.2 F - 13; P - 2; O - 3. Fishes: <i>Pampus chinensis</i> , <i>Harpadon nehereus</i> , <i>Lepturacanthus savala</i> , <i>Cynoglossus arel</i> , <i>Lagocephalus</i> sp., <i>Scoliodon laticaudus</i> , <i>Johnius glaucus</i> , <i>Arius caelatus</i> , <i>Lagocephalus</i> sp., <i>Otolithoides biauritus</i> , <i>Thyssa vitirostris</i> . Prawns: <i>Parapenaeopsis sculptilis</i> , <i>Metapenaeus</i> sp. Others : <i>Charybdis annulata</i> , <i>Matuta planipes</i> .
June 2003 i) Total catch (kg/h) ii) Total species (no) iii) Major species	4.7 F - 7; P - 1; O - 1. Fishes: <i>Ilisha megaloptera</i> , <i>Mugil</i> sp., <i>Strongylura strongylura</i> , <i>Trichiurus lepturus</i> , <i>Lagocephalus</i> sp., <i>Sillago sihama</i> , <i>Pomadasys otivaceus</i> . Prawns: <i>Penaeus</i> sp. Others : <i>Charybdis lucifera</i> .	4.7 F - 6; P - 2; O - 1. Fishes: <i>Thyssa mystax</i> , <i>Sillago sihama</i> , <i>Ilisha megaloptera</i> , <i>Trichiurus lepturus</i> , <i>Mugil</i> sp., <i>Arius</i> sp. Prawns: <i>Penaeus</i> sp. Others : <i>Charybdis lucifera</i> , <i>Cynoglossus arel</i> , <i>Johnius glaucus</i> , <i>Thyssa vitirostris</i> .	9.2 F - 9; P - 2; O - 1. Fishes: <i>Trichurus lepturus</i> , <i>Tenunlosa toil</i> , <i>Thyssa mystax</i> , <i>Mugil</i> sp., <i>Sillago sihama</i> , <i>Leiognathus</i> sp., <i>Lutjanidae</i> , <i>Cynoglossus arel</i> . Prawns: <i>Penaeus</i> sp., <i>Metapenaeus</i> sp. Others: <i>Charybdis</i> sp.

Table 4.5.35 (Contd 3)

Period/Parameter	Navinal Creek	Bocha Creek	Gulf
October 2003	3.5	4.0	17.3
i) Total catch (kg/h)	F - 4; P - 0; O - 1.	F - 5; P - 0; O - 1.	F - 11; P - 4; O - 3.
ii) Total species (no)	Fishes: <i>Mugil</i> sp., <i>Nibea maculata</i> , <i>Arius</i> sp., <i>Rhabdodargus</i> sp	Fishes: <i>Coilia dussumieri</i> , <i>Nibea maculata</i> , <i>Thryssa mystax</i> , <i>Pampus argenteus</i> , <i>Thryssa hamiltoni</i>	Fishes: <i>Otholithoides biauritus</i> , <i>Johnius</i> sp., <i>Pampus argenteus</i> , <i>Harpadon nehereus</i> , <i>Coilia dussumieri</i> , <i>Trichiurus lepturus</i> , <i>Scolidon laticaudus</i> , <i>Lepturacanthus savala</i> , <i>Pampus chinensis</i> , <i>Johnius glaucus</i> ,
iii) Major species	Others : <i>Scylla</i> sp.	Others : <i>Charybdis cruciata</i> .	Prawns: <i>Metapenaeus brevicornis</i> , <i>Exopalaemon styliferus</i> , <i>Parapenaeopsis sculptilis</i> , Others : <i>Charybdis cruciata</i> , <i>Loligo</i> , <i>Squilla</i> .

Table 4.5.35 (Contd 4)

Period/Parameter	Navinal Creek	Bocha Creek	Gulf
December 2004	2.9	2.4	10.2
i) Total catch (kg/h)	F - 4; P - 0; O - 1.	F - 7; P - 3; O - 3.	F - 14; P - 4; O - 4.
ii) Total species (no)	Fishes: <i>Mugil cephalus</i> , <i>Coilia dussumieri</i> , <i>Polynemus heptadactylus</i> , <i>Otolithes</i> sp., <i>Scomberomorus guttatus</i> , <i>Ilisha megaloptera</i> , <i>Thryssa hamiltonii</i> , <i>Johnius glaucus</i> .	Fishes: <i>Johnius glaucus</i> , <i>Coilia dussumieri</i> , <i>Mugil cephalus</i> , <i>Polynemus heptadactylus</i> , <i>Ilisha megaloptera</i> , <i>Thryssa</i> sp., <i>Scomberomorus guttatus</i> , Prawns: <i>Penaeus indicus</i> , <i>Parapenaeopsis sculptilis</i> .	Fishes: <i>Harpadon nehereus</i> , <i>Pampus argenteus</i> , <i>Pampus chinensis</i> , <i>Arius</i> sp., <i>Arius caelatus</i> , <i>Coilia dussumieri</i> , <i>Lepturacanthus savala</i> , <i>Johnius glaucus</i> , <i>Thryssa sussumieri</i> , <i>Therapon theraps</i> , <i>Scolidon laticaudus</i> , <i>Sillago sihama</i> .
iii) Major species	Prawns: <i>Penaeus indicus</i> , <i>Metapenaeus</i> sp., <i>Parapenaeopsis sculptilis</i> . Others : <i>Charybdis annulata</i> , <i>Squilla</i> , <i>Scylla</i> sp.	Others: <i>Metapenaeus</i> sp., <i>Matuta planipes</i> , <i>Charybdis annulata</i> .	Prawns: <i>Exhippolysmata ensirostris</i> , <i>Metapenaeus brevicornis</i> , <i>Metapenaeus</i> sp. Others: <i>Charybdis annulata</i> , <i>Scylla serrata</i> , <i>Matuta planipes</i> .

Table 4.5.35 (Contd 5)

Period/Parameter	Navinal Creek	Bocha Creek	Gulf
May 2005	3.9	3.5	16.9
i) Total catch (kg/h)	F - 9; P - 3; O - 3.	F - 9; P - 3; O - 4.	F - 16; P - 4; O - 4.
ii) Total species (no)	Fishes: <i>Coilia dussumieri</i> , <i>Harpadon nehereus</i> , <i>Otolithes</i> sp., <i>Thryssa</i> sp., <i>Johnius glaucus</i> , <i>Ilisha megaloptera</i> , <i>Mugil</i> sp., <i>Trypauchen vagina</i> .	Fishes: <i>Lepturacanthus savala</i> , <i>Harpadon nehereus</i> , <i>Ilisha megaloptera</i> , <i>Johnius glaucus</i> , <i>Mugil cephalus</i> , <i>Otolithes</i> sp., <i>Coilia dussumieri</i> , <i>Trypauchen vagina</i> .	Fishes: <i>Harpadon nehereus</i> , <i>Coilia dussumieri</i> , <i>Pampus chinensis</i> , <i>Pampus argenteus</i> , <i>Lepturacanthus savala</i> , <i>Arius</i> sp., <i>Arius caelatus</i> , <i>Scolidon laticaudus</i> , <i>Trypauchen vagina</i> , <i>Ilisha megaloptera</i> , <i>Thryssa vitirostris</i> , <i>Otolithes</i> sp., <i>Saurida tumbil</i> .
iii) Major species	Prawns: <i>Solenocera crassicornis</i> , <i>Parapenaeopsis stylifera</i> , <i>Metapenaeus</i> sp., <i>Exopalaemon styliferus</i> . Others: <i>Matuta planipes</i> , <i>Charybdis annulata</i> .	Prawns: <i>Solenocera crassicornis</i> , <i>Metapenaeus</i> sp., <i>Parapenaeopsis</i> sp., <i>Matuta planipes</i> , <i>Charybdis annulata</i> . Others:	Prawns: <i>Parapenaeopsis stylifera</i> , <i>Solenocera crassicornis</i> , <i>Penaeus</i> sp., <i>Metapenaeus dobsoni</i> . Others: <i>Charybdis cruciata</i> , <i>Charybdis annulata</i> , <i>Matuta planipes</i> .

Table 4.5.36 : Check list of birds recorded in the study area (Mundra)

No	Scientific name	Common english name	T/W	Abundance status	Migratory status
	Family & species				
	Phasianidae				
1	<i>Francolinus pondicerianus</i>	Grey francolin	T	C	R
2	<i>Pavo cristatus</i>	Indian peafowl	T	C	R
	Picidae				
3	<i>Dendrocopos mahrattensis</i>	Yellow-crowned woodpecker	T	VR	R
	Upupidae				
4	<i>Upupa epops</i>	Common hoopoe	T	R	R
	Coraciidae				
5	<i>Coracias garrulus</i>	European roller	T	R	M
6	<i>Coracias benghalensis</i>	Indian roller	T	C	R
	Alcedinidae				
7	<i>Alcedo hercules</i>	Common kingfisher	W	R	R
8	<i>Halcyon amayroptera</i>	White throated kingfisher	W	R	R
	Meropidae				
9	<i>Merops orientalis</i>	Green bee-eater	T	A	R
10	<i>Merops persicus</i>	Blue-cheeked bee-eater	T	R	RM
	Cuculidae				
11	<i>Eudynamys scolopacea</i>	Indian Koel	T	C	R
	Centropodidae				
12	<i>Centropus sinensis</i>	Greater coucal	T	R	R
	Psittacidae				
13	<i>Psittacula krameri</i>	Rose-ringed parakeet	T	C	R
	Apodidae				
14	<i>Apus affinis</i>	House swift	T	R	R
	Strigidae				
15	<i>Bubo nipalensis</i>	Spot-bellied eagle-owl	T	R	R
16	<i>Athene brama</i>	Spotted owlet	T	C	R

Table 4.5.36 (Contd 2)

No	Scientific name	Common English name	T/W	Abundance status	Migratory status
Caprimulgidae					
17	<i>Caprimulgus indicus</i>	Sykes's nightjar	T	R	RM
18	<i>Caprimulgus asiaticus</i>	Indian nightjar	T	R	R
Columbidae					
19	<i>Columba livea</i>	Blue rock pigeon	T	A	R
20	<i>Streptopelia senegalensis</i>	Laughing dove	T	A	R
21	<i>Streptopelia tranquebarica</i>	Red collared-dove	T	R	R
22	<i>Streptopelia decaocto</i>	Eurasian collared-dove	T	C	R
Otididae					
23	<i>Chlamydotis macqueeni</i>	Houabara bustard	T	VR	M
Gruidae					
24	<i>Grus leucogeranus</i>	Common crane	W/T	C	M
Pteroclididae					
25	<i>Pterocles alchata</i>	Chestnut-bellied sandgrouse	T	C	R
Scolopaciidae					
26	<i>Limosa limosa</i>	Black-tailed godwit	W	R	M
27	<i>Limosa lapponica</i>	Bar-tailed godwit	W	C	M
28	<i>Numenius phaeopus</i>	Whimbrel	W	A	M
29	<i>Numenius arquata</i>	Eurasian curlew	W	A	M
30	<i>Tringa erythropus</i>	Spotted redshank	W	R	M
31	<i>Tringa totanus</i>	Common redshank	W	A	RM
32	<i>Tringa stagnatilis</i>	Marsh sandpiper	W	C	M
33	<i>Tringa nebularia</i>	Common greenshank	W	C	R
34	<i>Tringa glareola</i>	Wood sandpiper	W	R	M
35	<i>Xenus cinereus</i>	Terek sandpiper	W	C	W
36	<i>Actitis hypoleucos</i>	Common sandpiper	W	A	RM

Table 4.5.36 (Contd 3)

No	Scientific name	Common english name	WW	Abundance status	Migratory status
37	<i>Calidris tenuirostris</i>	Sanderling	W	C	M
38	<i>Calidris minuta</i>	Little stint	W	R	M
39	<i>Calidris temminckii</i>	Temminck's stint	W	R	M
40	<i>Calidris alpina</i>	Dunlin	W	C	M
41	<i>Philomachus pugnax</i>	Ruff	W	R	M
42	<i>Phalaropus lobatus</i>	Red-necked phalarope	W	R	M
43	<i>Vanellus malarbaricus</i>	Yellow-wattled lapwing	T	R	R
44	<i>Vanellus indicus</i>	Red-wattled lapwing	W/T	A	R
Charadriidae					
45	<i>Haematopus ostralegus</i>	Eurasian oystercatcher	W	R	M
46	<i>Himantopus himantopus</i>	Blackwinged stilt	W	R	R
47	<i>Recurvirostra avosetta</i>	Pied avocet	W	R	RM
48	<i>Pluvialis apricaria</i>	Eurasian golden plover	W	R	M
49	<i>Pluvialis squatarola</i>	Grey plover	W	R	M
50	<i>Charadrius hiaticula</i>	Common ringed plover	W	C	RM
51	<i>Charadrius alexandrinus</i>	Kentish plover	W	C	RM
52	<i>Charadrius leschenaultii</i>	Greater sand plover	W	C	M
Glareolidae					
53	<i>Dromas ardeola</i>	Crab-plover	W	R	M
Laridae					
54	<i>Rynchops albicollis</i>	Indian skimmer	W	VR	R
55	<i>Larus argentatus</i>	Herring gull	W	VR	R
56	<i>Larus brunnicephalus</i>	Brown-headed gull	W	R	RM
57	<i>Larus genei</i>	Slender Billed tern	W	A	RM
58	<i>Gelochelidon nilotica</i>	Gull-billed tern	W	A	RM
59	<i>Sterna caspia</i>	Caspian tern	W	R	RM

Table 4.5.36 (Contd 4)

No	Scientific name	Common english name	TW	Abundance status	Migratory status
60	<i>Sterna aurantia</i>	River tern	W	C	R
61	<i>Sterna bergii</i>	Great crested tern	W	R	R
62	<i>Sterna albifrons</i>	Little tern	W	R	R
63	<i>Chlidonias hybridus</i>	Whiskered tern	W	C	RM
Acipitridae					
64	<i>Pandion haliaetus</i>	Osprey	W/T	VR	RM
65	<i>Pernis ptilorhyncus</i>	Oriental honey buzzard	T	VR	RM
66	<i>Elanus caeruleus</i>	Black-shouldered kite	T	VR	R
67	<i>Haliastur indus</i>	Brahminy kite	T	VR	R
68	<i>Circaehr gallicus</i>	Shorat-toed snake-eagle			
69	<i>Circus aeruginosus</i>	Eurasian marsh harrier	T/W	VR	M
70	<i>Circus macrourus</i>	Pallid harrier	T	VR	M
71	<i>Accipiter nisus</i>	Eurasian sparrowhawk	T	R	M
72	<i>Aquila rapax</i>	Tawny eagle	T	VR	R
73	<i>Hieraaetus fasciatus</i>	Bonelli's eagle	T	VR	R
Falconidae					
74	<i>Falco tinnunculus</i>	Common kestrel	T	VR	RM
75	<i>Falco chicquera</i>	Red-headed merlin	T	VR	R
76	<i>Falco subbuteo</i>	Northern hobby	T	VR	RM
77	<i>Falco jugger</i>	Lagger falcon	T	VR	RM
Ardeidae					
78	<i>Egretta garzetta</i>	Little egret	W	C	R
79	<i>Egretta gularis</i>	Western reef heron	W		RM
80	<i>Ardea cinerea</i>	Grey heron	W		RM
81	<i>Casmerodius albus</i>	Great egret	W		RM
82	<i>Mesophoyx intermedia</i>	Intermediate egret	W		RM
83	<i>Bubulcus ibis</i>	Cattle egret	T		R
84	<i>Ardeola grayii</i>	Indian pond-heron	W		R

Table 4.5.36 (Contd 5)

No	Scientific name	Common English name	T/W	Abundance status	Migratory status
85	<i>Phoenicopterus ruber</i>	Greater flamingo	W		R
86	<i>Phoenicopterus minor</i>	Lesser flamingo	W		R
Threskiornithidae					
87	<i>Threskiornis melanocephalus</i>	Asian white ibis	W		R
88	<i>Pseudibis papillosa</i>	Black ibis	W/T		R
89	<i>Platalea leucorodia</i>	Eurasian spoonbill	W		RM
Pelecanidae					
90	<i>Pelecanus crispus</i>	Dalmatian pelican	W		M
Ciconiidae					
91	<i>Mycteria leucocephala</i>	Painted stork	W		RM
Laniidae					
92	<i>Lanius collurio</i>	Rufous-tailed shrike	T		M
93	<i>Lanius vittatus</i>	By-backed shrike	T		R
94	<i>Lanius schach</i>	Long-tailed shrike	T		R
95	<i>Lanius excubitor</i>	Great grey shrike	T		RM
Corvidae					
96	<i>Corvus splendens</i>	House crow	T		R
97	<i>Corvus macrorhynchos</i>	Jungle crow	T		R
98	<i>Pericrocotus cinnamomeus</i>	Small minivet	T		R
99	<i>Dicrurus macrocercus</i>	Black drongo	T		R
100	<i>Aegithina tiphia</i>	Marshall's lora	T		R
101	<i>Tephrodornis pondicerianus</i>	Lesser woodshrike	T		R
Muscicapidae					
102	<i>Ficedula zanthopygia</i>	Red-throated flycatcher	T		M
103	<i>Saxicoloides fulicate</i>	Indian robin	T		R
104	<i>Phoenicurus ochruros</i>	Black redstart	T		M
105	<i>Oenanthe pleschanka</i>	Pied wheatear	T		M

Table 4.5.36 (Contd 6)

No	Scientific name	Common english name	T/W	Abundance status	Migratory status
106	<i>Oenanthe deserti</i>	Desert wheather	T		M
107	<i>Oenanthe isabellina</i>	Isabelline wheather	T		M
Sturnidae					
108	<i>Strunus pagodarum</i>	Brahminy starling	T		R
109	<i>Strunus roseus</i>	Rosy starling	T		M
110	<i>Acridotheres tristis</i>	Common myna	T		R
111	<i>Acridotheres ginginianus</i>	Bank myna	T		R
Hirundinidae					
112	<i>Hirundo rustica</i>	Barn swallow	T	R	RM
113	<i>Hirundo smithii</i>	Wire-tailed swallow	T	R	R
114	<i>Hirundo daurica</i>	Red-rumped swallow	T	C	R
Pycnonotidae					
115	<i>Pycnonotus leucotis</i>	White-eared bulbul	T	A	R
116	<i>Pycnonotus cafer</i>	Red-ventled bulbul	T	C	R
Cisticolidae					
117	<i>Prinia buchanani</i>	Rufous-fronted prinia	T	C	R
118	<i>Prinia sylvatica</i>	Jungle prinia	T	R	R
Zosterops					
119	<i>Zosterops palpebrosus</i>	Oriental white-eye	T	C	R
Sylviidae					
120	<i>Acrocephalus dumetorum</i>	Blyth's reed warbler	T	C	M
121	<i>Acrocephalus arundinaceus</i>	Great reed warbler	T	C	M
122	<i>Hippolais caligata</i>	Booted warbler	T	VR	M
123	<i>Orthotomus sutorius</i>	Common tailorbird	T	A	R
124	<i>Turdoides caudatus</i>	Common babbler	T	A	R
125	<i>Sylvia curruca</i>	Lesser whitethroat	T	A	M

Table 4.5.36 (Contd 7)

No	Scientific name	Common english name	T/W	Abundance status	Migration status
126	<i>Sylvia hortensis</i>	Orphean warbler	T	R	M
Alaudidae					
127	<i>Mirafra cantillans</i>	Singing bush- lark	T	R	R
128	<i>Eremopterix grisea</i>	Ashy- crowned sparrow- lark	T	R	R
129	<i>Calandrella cheleensis</i>	Asian short- toed lark	T	C	M
130	<i>Calandrella raytal</i>	Sand short-toed lark	T	C	M
131	<i>Galerida cristata</i>	Crested lark	T	R	R
132	<i>Alauda gulgula</i>	Eastern skylark	T	VR	R
Nectariniidae					
133	<i>Nectarinia asiatica</i>	Purple sunbird	T	A	R
Passeridae					
134	<i>Passer domesticus</i>	House sparrow	T	A	R
135	<i>Passer sp.</i>	Yellow throated sparrow			
136	<i>Motacilla cinerea</i>	Grey wagtail			
137	<i>Motacilla alba</i>	White wagtail	W/T	VR	M
138	<i>Anthus campestris</i>	Tawny pipit	T	VR	M
139	<i>Ploceus philippinus</i>	Baya weaver	T	C	R
140	<i>Lonchura malabarica</i>	Plain munia	T	A	R

T/W T: Terrestrial bird, W : Water bird, Abundance status – A: Abundance, C: Common, R : Rare, VR : Very rare.