

Zostera, 1999/00

	Consumers																													
	Zooplankton	<i>Amphithoe valida</i>		<i>Melita palmata</i>	<i>Cerastoderma edule</i>		<i>Scrobicularia plana</i>	<i>Carcinus maenas</i>	<i>Crangon crangon</i>	<i>Haminoea hydatis</i>	<i>Hydrobia ulvae</i>	<i>Littorina littorea</i>	<i>Cyathura carinata</i>	<i>Idotea chelipes</i>	<i>Alkmaria romijni</i>	<i>Capitella capitata</i>	<i>Chaetozone setosa</i>	<i>Eteone flava</i>	<i>Glycera tridactyle</i>	<i>Hediste diversicolor</i>	<i>Heteromastus filiformis</i>	<i>Lagis koreni</i>	<i>Medomastus fragilis</i>	<i>Mista picta</i>	<i>Nephtys</i> spp.	<i>Streblospio shrubsoii</i>	Nemertini	Oligochaets		
No. Prey	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
1 Phytoplankton	0.98			0.80	0.20									0.10				0.05												
2 Microphytobenthos		0.10	0.10	0.10	0.20			0.30	0.45	0.05	0.10							0.05						0.05						
3 Green macroalgae		0.20	0.20			0.04	0.05	0.05		0.50	0.20																			
4 <i>Zostera noltii</i>										0.20	0.05																			
5 Zooplankton	0.02					0.06	0.08																				0.005			
6 <i>Amphithoe valida</i>						0.02	0.02				0.006							0.03	0.001					0.005		0.01				
7 <i>Melita palmata</i>						0.005	0.0005				0.001							0.001						0.001						
8 <i>Cerastoderma edule</i>						0.01	0.001											0.005	0.001					0.002		0.005				
9 <i>Scrobicularia plana</i>							0.11	0.16										0.14	0.069					0.05		0.08				
10 <i>Carcinus maenas</i>						0.05	0.01				0.04																			
11 <i>Crangon crangon</i>							0.14	0.01																						
12 <i>Haminoea hydatis</i>							0.002																			0.005				
13 <i>Hydrobia ulvae</i>							0.023	0.05										0.03	0.07							0.05				
14 <i>Littorina littorea</i>							0.005	0.01																		0.005				
15 <i>Cyathura carinata</i>							0.015	0.06																		0.06				
16 <i>Idotea chelipes</i>							0.001	0.001			0.001							0.01												
17 <i>Alkmaria romijni</i>								0.005			0.001							0.005							0.001					
18 <i>Capitella capitata</i>											0.001							0.005							0.001					
19 <i>Chaetozone setosa</i>							0.002	0.002										0.04	0.002					0.004		0.005				
20 <i>Eteone flava</i>							0.001	0.001										0.001	0.002					0.004		0.005				
21 <i>Glycera tridactyla</i>							0.005	0.003			0.005							0.01	0.001					0.01		0.005				
22 <i>Hediste diversicolor</i>							0.17	0.14			0.129						0.66	0.37					0.70	0.45	0.35					
23 <i>Heteromastus filiformis</i>							0.002	0.02			0.03	0.10					0.15	0.09	0.04				0.15	0.09	0.10					
24 <i>Lagis koreni</i>							0.001	0.001										0.001								0.005				
25 <i>Mediomastus fragilis</i>																		0.001	0.001											
26 <i>Mista picta</i>							0.001	0.001			0.001							0.01	0.001					0.001						
27 <i>Nephtys</i> spp.							0.005	0.01										0.01	0.001					0.001		0.005				
28 <i>Streblospio shrubsoii</i>																	0.04	0.01								0.005				
29 Nemertini							0.001	0.001			0.005							0.001	0.001							0.05				
30 Oligochaets							0.001	0.003			0.03	0.15					0.05	0.03	0.01				0.05	0.03	0.05					
31 Detritus		0.70	0.70	0.10	0.60	0.15	0.30	0.65	0.55	0.25	0.75	0.40	0.90	1.00	1.00	1.00	1.00	0.20	0.70	1.00	1.00	1.00	1.00	0.10	0.30	1.00	0.20	1.00		
Imports						0.18	0.06																							
Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			

Zostera, 2001/02

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bare sediment, 1993/94

No. Prey		Consumers																							
		Zooplankton	<i>Amphithoe valida</i>	<i>Melita palmata</i>	<i>Cerastoderma edule</i>	<i>Scrobicularia plana</i>	<i>Carcinus maenas</i>	<i>Crangon crangon</i>	<i>Haminoea hydatis</i>	<i>Hydrobia ulvae</i>	<i>Cyathura carinata</i>	<i>Idotea chelipes</i>	<i>Alkmaria romijni</i>	<i>Capitella capitata</i>	<i>Chaetozone setosa</i>	<i>Glycera tridactyla</i>	<i>Hediste diversicolor</i>	<i>Heteromastus filiformis</i>	<i>Pygospio elegans</i>	<i>Streblospio shrubsolii</i>	Nemertini	Oligochaets			
1	Phytoplankton	0.98			0.85	0.40						0.10				0.05		0.60							
2	Microphytobenthos		0.10	0.10	0.05	0.40			0.65	0.75		0.10				0.05									
3	Green macroalgae		0.75	0.75			0.08	0.06	0.10		0.015	0.70													
4	Zooplankton	0.02					0.06	0.1													0.005				
5	<i>Amphithoe valida</i>						0.03	0.02			0.001					0.03	0.03				0.05				
6	<i>Melita palmata</i>						0.03	0.03			0.001					0.04	0.02				0.04				
7	<i>Cerastoderma edule</i>						0.001	0.002								0.005	0.01				0.005				
8	<i>Scrobicularia plana</i>						0.08	0.09								0.08	0.058				0.04				
9	<i>Carcinus maenas</i>						0.06	0.01			0.003														
10	<i>Crangon crangon</i>						0.14	0.01																	
11	<i>Haminoea hydatis</i>						0.001									0.01					0.005				
12	<i>Hydrobia ulvae</i>						0.02	0.05								0.03	0.05				0.04				
13	<i>Cyathura carinata</i>						0.04	0.05													0.03				
14	<i>Idotea chelipes</i>						0.001	0.01								0.01					0.01				
15	<i>Alkmaria romijni</i>							0.01			0.004	0.05				0.095					0.09				
16	<i>Capitella capitata</i>															0.01	0.025								
17	<i>Chaetozone setosa</i>						0.001	0.001								0.01	0.001				0.005				
18	<i>Glycera tridactyla</i>						0.001	0.001								0.02	0.001				0.002				
19	<i>Hediste diversicolor</i>						0.095	0.084			0.001					0.28					0.26				
20	<i>Heteromastus filiformis</i>						0.01	0.04			0.001	0.05				0.11	0.05				0.098				
21	<i>Pygospio elegans</i>															0.03	0.002				0.01				
22	<i>Streblospio shrubsolii</i>															0.02	0.002				0.01				
23	Nemertini							0.001								0.01					0.05				
24	Oligochaets							0.001				0.05				0.01	0.001				0.05				
25	Detritus Imports		0.15	0.15	0.10	0.20	0.15	0.35	0.25	0.25	0.974	0.05	0.90	1.00	1.00	0.20	0.65	1.00	0.40	1.00	0.20	1.00			
	Sum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			

bare sediment, 1999/00

[illegible]

bare sediment, 2001/02

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Appendix B. Model data sources from the *Zostera* and bare sediment ecosystems in Mondego estuary for each time periods.

Compartments	Parameter	Source
Phytoplankton	Biomass	Pardal (1998), Lillebø et al. (2005)
	C:Chl a ratio	Anderson and Williams (1998)
	P/B	Almeida et al. (2000), this study
Microphytobenthos	Biomass	this study
	C:Chl a ratio	de Jonge (1980)
	P/B	Brotas and Catarino (1995), Serôdio and Catarino (2000)
Green macroalgae	Biomass	Pardal (1998), this study
	P/B	Anibal (1998)
<i>Zostera noltii</i>	Biomass	Pardal (1998), this study
	P/B	Sand-Jensen (1975); Pérez-Lloréns and Niell (1993)
Zooplankton	Biomass	Azeiteiro (1999)
	P/B	Rosado-Salórzano and Próo (1998)
	Diet	Azeiteiro (1999), Baeta et al. (2009)
<i>Ampithoe valida</i>	Biomass	Pardal (1998), this study
<i>Melita palmata</i>	P/B	Pardal (1998), Grilo et al. (2009)
	P/Q	Hostens and Hamerlynck (1994)
	Diet	Pardal <i>et al.</i> (2000), Baeta et al. (2009)
<i>Corophium multisetosum</i>	Biomass	this study
	P/B	this study
	P/Q	Hostens and Hamerlynck (1994)
	Diet	Cunha et al. (2000), Baird et al (2004), Baeta et al. (2009)
<i>Cerastoderma edule</i>	Biomass	Pardal (1998), this study
<i>Mytilus</i> sp.	P/B	Dolbeth et al. (2003, 2007), this study
<i>Scrobicularia plana</i>	P/Q	Hostens and Hamerlynck (1994)
	Diet	Eklöf et al. (2005), Garcia-Arberas and Rallo (2002), Verdelhos et al. (2005), Baeta et al. (2009; submitted)
<i>Carcinus maenas</i>	Biomass	Pardal (1998), this study
<i>Crangon crangon</i>	P/B	Dolbeth et al. (2003), this study
	P/Q	Hostens and Hamerlynck (1994)
	Diet	Oh et al. (2001), Baeta et al. (2006, 2009)
<i>Gibulla umbilicalis</i>	Biomass	Pardal (1998), this study
	P/B	this study
	P/Q	Hostens and Hamerlynck (1994)
	Diet	Bode et al. (2006), Baeta et al. (2009)
<i>Haminoea hydatis</i>	Biomass	Pardal (1998), this study

<i>Hydrobia ulvae</i>	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Malaquias et al. (2004)
	Biomass	Pardal (1998), this study
	<i>P/B</i>	Dolbeth et al. (2007)
<i>Littorina littorea</i>	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Baeta et al. (2009; submitted)
	Biomass	Pardal (1998), this study
	<i>P/B</i>	Dolbeth et al. (2003), this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
<i>Cyathura carinata</i>	Diet	Bode et al. (2006), Baeta et al. (2009)
	Biomass	Pardal (1998), this study
	<i>P/B</i>	Dolbeth et al. (2007)
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Ferreira et al. (2004), Baeta et al. (2009)
<i>Idotea chelipes</i>	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Bamber (2004), Baeta et al. (2009)
	Biomass	Pardal (1998), this study
<i>Lekanesphaera levii</i>	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Mancinelli et al. (2005), Baeta et al. (2009)
	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study
<i>Alkmaria romijni</i>	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Bamber (2004), Baeta et al. (2009)
	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
<i>Aonides oxycephala</i>	Diet	Bamber (2004), Baeta et al. (2009)
	Biomass	Pardal (1998)
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Dauer et al. (1981)
<i>Capitella capitata</i>	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Gaston and Nasci (1988), Baeta et al. (2009)
	Biomass	Pardal (1998), this study
<i>Chaetozone setosa</i>	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Oug et al. (1998)
	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study

<i>Diopatra neapolitana</i>	Biomass	Pardal (1998)
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Mangum et al. (1968)
<i>Eteone flava</i>	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Oug et al. (1998), Volkenborn and Reise (2007)
<i>Glycera tridactyla</i>	Biomassa	Pardal (1998), this study
<i>Hediste diversicolor</i>	<i>P/B</i>	Dolbeth et al. (2007), this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Garcia-Arberas and Rallo (2002), Baeta et al. (2009)
<i>Heteromastus filiformis</i>	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Volkenborn and Reise (2007), Baeta et al. (2009)
<i>Lagis koreni</i>	Biomass	Pardal (1998)
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Mistri et al. (2001)
<i>Lumbrineris impatiens</i>	Biomass	Pardal (1998)
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Hily et al. (2008)
<i>Mediomastus fragilis</i>	Biomass, <i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Rakocinski et al. (1997)
<i>Mista picta</i>	Biomass, <i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Solis-Weiss et al. (2004)
<i>Nephtys hombergii</i>	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Beukema (1991), Volkenborn and Reise (2007), Baeta et al. (2009)
<i>Streblospio shrubsolii</i>	Biomass	Pardal (1998), this study
<i>Pygospio elegans</i>	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Mazik and Elliott (2000), Volkenborn and Reise (2007), Baeta et al. (2009)

Nemertini	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	McDermott and Roe (1985), Thiel and Reise (1993)
Oligochaeta	Biomass	Pardal (1998), this study
	<i>P/B</i>	this study
	<i>P/Q</i>	Hostens and Hamerlynck (1994)
	Diet	Giere (1975)
Detritus	Biomass	Pardal (1998, 2004)
	(O.M in the sediment)	