

## Appendix 1: New Zealand archaeological sites with reliable information on fish abundance

The information below is a summary of MNI values for 126 archaeological sites in New Zealand. This constitutes the best currently available information. Although many identifications were originally made to species or genus level, they are grouped into families here. For this summary, the MNI values are combined for all stratigraphic provenances in each site. The matrix presented below has 126 rows (one for each site) and 36 columns (one for each fish family). The total MNI for all sites is 40,433. The matrix is preceded by a list summarising each site in the matrix and a second list summarising the fish families.

The approximate age of each site is indicated by a numeral from 1 to 3. These assessments follow the extensive discussion on dating in Leach & Boocock

(1993). For sites not included in that volume, the age assessments provided by Anderson (1997) are followed. In a few sites, Mana North, Long Beach, Rotokura, there is significant chronological change, and the blanket age assessment reflects the bulk of the fish remains. The age categories are:

1 = *Early Prehistoric*. Before AD 1500, loosely corresponding to what is referred to as the Archaic Period, or New Zealand East Polynesian Culture.

2 = *Late Prehistoric*. After AD 1500 and before AD 1769, loosely corresponding to what is referred to as Classic Māori culture.

3 = *Protohistoric*. After AD 1769 and before AD 1840. Protohistoric Māori settlements.

No	NZAA #	Abbrev	MNI	Site Name	Easting	Northing	Age
1	B44/41	BRE1	1153	Breaksea Sound 1, Discovery Cove, (BSS/1)	2032600	5498800	3
2	B43/7	BRE2	1	Breaksea Sound 2, Chatham Point 3, BSS/2	2032700	5501000	2
3	B45/1	CASC	125	Cascade Cove, Dusky Sound (CC/1)	2012200	5469400	2
4	B45/22	CHAL	45	Chalky Is, Chalky Inlet, Southport CH/1	2013900	5444100	1
5	B44/22	COOP	219	Coopers Island, Dusky Sound, (CI/1)	2027000	5478700	1
6	R10/38	DUND	54	Davidson undefended site, Motutapu Is	2682400	6493200	2
7	K30/2	FOXR	102	Fox River, Te Onumata, Potikohua River	2376000	5907200	2
8	S24/3	FOXT	270	Foxton	2700900	6081300	1
9	B45/23	GARD	1	Garden Island, Chalky Inlet, Southport	2014300	5444200	3
10	O27/13	GLEN	179	The Glen, Tasman Bay	2540300	6002400	1
11	T8/5	HARW	65	Harataonga Bay W Midden, Gt Barrier Is	2734100	6555800	1
12	T11/115	HOTW	278	Hot Water Beach, Coromandel Peninsula	2762100	6475200	1
13	O32/10	HUDS	27	Hudson's Site, Goose Bay, Kaikoura	2553300	5858700	2
14	Q27/30	IKAE	63	Te Ika a Maru, Eastern Flat	2649400	5994100	2
15	Q27/36	IKAF	199	Te Ika a Maru, Flat at Base of Pa	2649400	5994200	2
16	C240/21	KAHN	95	Kahiti North, Hansons Bay, Chatham Is	3291687	5747400	2
17	C240/20	KAHS	159	Kahiti South, Hansons Bay, Chatham Is	3291687	5747300	2
18	E48/30	KIRI	56	Te Kiri Kiri, Ruapuke Island, (KK/1)	2164800	5371500	3
19	E48/36	LEEI	8	Lee Island Site, on Ruapuke Island, LI/1	2169300	5374700	1
20	I44/23	LOBE	5770	Long Beach, Dunedin	2326900	5491400	2
21	B44/1	LONG	252	Long Island, Dusky Sound, (LI/1)	2013900	5472900	2
22	R10/31	LUND	12	Leahy undefended site, Motutapu Island	2682500	6493400	2
23	R27/41	MAKB	50	Makara Beach Midden	2653100	5997200	2
24	R27/42	MAKT	24	Makara Terrace Midden	2653000	5997200	2
25	B45/23	MILF	7	Milford	2014300	5444200	2
26	C240/277	NGAI	4	Te Ngaio, Petre Bay, Chatham Island	3271787	5747500	2
27	C240/273	OHIN	17	Ohinemamao, Petre Bay, Chatham Island	3273987	5749000	2
28	O32/8	OMIH	118	Omihi, Kaikoura	2552700	5856500	2
29	G47/50	PAPA	27	Papatowai, Catlins	2239800	5399600	1
30	E48/34	PARA	12	Parangiaio, Ruapuke Island, (PP/1)	2169100	5372500	1
31	R26/122	PARE	147	Paremata	2666700	6010200	2
32	C46/16	PCRI	114	Port Craig Cave, Foveaux Strait, (PC/1)	2074900	5428500	1

33	C46/17	PCR2	2	Port Craig Dry Rock Shelter 1, Foveaux	2074900	5428700	3
34	C46/18	PCR3	1	Port Craig Dry Rock Shelter 2, Foveaux	2074900	5428700	1
35	C46/19	PCR4	28	Port Craig Midden, Foveaux Strait, PC/4	2074200	5430000	1
36	O31/15	PEKP	54	Peketa Pa, Kaikoura	2558300	5863400	2
37	T9/139	PIAC	45	Port Jackson, Coromandel	2759400	6525800	1
38	C240/266	POKI	7	Pokiakio, Petre Bay, Chatham Islands	3277087	5751100	2
39	I43/22	ROSS	144	Ross's Rocks, Otago	2326100	5501100	1
40	C46/31	SAN1	214	Sandhill Point 1, Foveaux Strait, SHP/1	2072100	5424300	1
41	C46/31	SAN2	2	Sandhill Point 2, Foveaux Strait, SHP/2	2072100	5424300	1
42	C46/31	SAN3	364	Sandhill Point 3, Foveaux Strait, SHP/3	2072100	5424300	2
43	C46/31	SAN4	105	Sandhill Point 4, Foveaux Strait, SHP/4	2072100	5424300	1
44	B45/11	SOU1	443	Southport 1, Fiordland, (SP/1)	2014900	5444700	3
45	B45/14	SOU4	86	Southport 4, Cave Site, Fiordland, SP/4	2014800	5444900	1
46	B45/15	SOU5	120	Southport 5, Cave Site, Fiordland, SP/5	2014800	5444900	2
47	B45/16	SOU6	185	Southport 6, Fiordland, (SP/6)	2014800	5444900	3
48	B45/17	SOU7	111	Southport 7, Fiordland, (SP/7)	2014800	5444900	3
49	B45/18	SOU8	10	Southport 8, Fiordland, (SP/8)	2014900	5445100	2
50	B45/19	SOU9	1	Southport 9, Cave Site, Fiordland, SP/9	2014900	5445100	2
51	R10/26	STAT	156	Station Bay Pa, Motutapu Island	2682900	6493300	2
52	R10/25	SUND	128	Sunde Site, Motutapu Island	2679700	6492000	1
53	J44/77	TAIA	40	Taiaroa Head, Otago Peninsula	2333000	5490100	2
54	O31/5	TAKA	130	Takahanga Post Office Site Kaikoura	2566200	5866800	2
55	P26/217	TITC	14	Titirangi Cattleyards, Marlborough	2606200	6020100	1
56	P26/229	TITG	2	Goose Bay Midden, Titirangi, Marlborough	2606400	6021200	2
57	P26/218	TITP	1	Titirangi Pa, Marlborough Sounds	2606400	6020200	2
58	P26/208	TITS	47	Titirangi Sandhills, Marlborough Sounds	2605500	6020100	1
59	E47/13	TIWA	103	Tiwai Point, Bluff Harbour	2155400	5391900	1
60	N37/12	TUMB	42	Tumbledown Bay, Banks Peninsula	2491500	5706000	1
61	D46/38	WAKA	94	Wakapatu, Western Southland	2113200	5414100	1
62	S23/71	MANA	54	Parewanui Midden, Bulls, Manawatu	2700700	6102900	3
63	J43/2	SHAG	2134	Shag River Mouth	2339100	5522900	1
64	O6/317	KOKO	844	Kokohuia, Hokianga	2546200	6631100	1
65	U13/1101	MATA	132	Midden 8, Matakana Island	2777300	6406100	2
66	S28/49	WASH	771	Washpool Site, Palliser Bay	2694400	5965600	1
67	S28/54	MAK3	9	Makotukutuku M3 Fort Site, Palliser Bay	2696100	5966300	2
68	S28/48	MAK1	5	Makotukutuku M1 Camp Site, Palliser Bay	2694300	5965600	2
69	S28/104	BLR2	58	Black Rocks BR2 Pond Midden, Palliser	2696600	5953400	2
70	S28/104	BLR3	191	Black Rocks BR3 Black Midden, Palliser	2696600	5953400	1
71	S28/104	BLR4	705	Black Rocks BR4 Crescent Midden Palliser	2696600	5953400	1
72	S28/103	BLR5	21	Black Rocks Fan	2696400	5954500	1
73	R26/141	MAN1	596	Mana Island South Midden R26/141A	2659800	6011000	1
74	R26/141	MAN2	1206	Mana Island North Settlement R26/141	2659800	6011000	2
75	B46/12	ANDR	9	Andrewburn, Fiordland	2032200	5425700	2
76	I43/1	HURI	453	Huriawa Peninsula. Areas A,B,Salvage	2328200	5504900	2
77	E49/15	KELL	13	Kelly's Beach, Stewart Island	2143000	5338800	2
78	O31/30	OLDP	25	Old Pier Point Avoca, Kaikoura	2568100	5865300	1
79	I44/1	OMIM	27	Omimi, Otago	2324100	5498900	1
80	I44/5	OTOK	3	Otokia Mouth, Brighton Beach, Otago	2303300	5470100	1
81	H47/1	POUN	428	Pounaweia, Otago	2256300	5409900	1
82	I44/21	PURA	2745	Purakanui Inlet, Otago	2325300	5492800	1
83	D46/35	RIVE	14	Riverton, Southland	2121400	5415300	1
84	O27/1	ROTO	585	Rotokura, Tasman Bay	2544400	6005300	1
85	J42/22	WAIA	6	Waianakarua Mouth, North Otago	2341600	5548300	1
86	T8/4	HARP	231	Harataonga Bay E. Midden, Gt Barrier Is	2734400	6555900	2
87	U12/5	SLIP	13	Slipper Island, Near Tairua Harbour	2771400	6457100	1
88	T11/62	TAIR	70	Tairua, Coromandel	2765000	6463000	1
89	T12/2	WHAN	6	Whangamata Wharf, Coromandel	2765800	6440500	1
90	T10/399	CROS	481	Cross Creek Site	2758700	6496300	1
91	C240/283	WAIH	4197	Waihora, Chatham Islands	3269687	5744100	2
92	C240/681	CHAA	884	CHA, Chatham Islands	3270187	5744700	2
93	C240/680	CHBB	4978	CHB, Chatham Islands	3270387	5745000	2
94	C240/689	CHCC	3	CHC, Chatham Islands	3269887	5744500	2
95	N36/72	PANA	68	Panau, Canterbury Peninsula	2512500	5728100	2
96	M2/162	TWIL	635	Twilight Beach, Northland	2482200	6746100	1

97	N3/582	AUPO	18	Aupouri Dune Middens 90 Mile Beach	2507400	6722600	2
98	N3/59	HOUH	2425	Houhora	2525300	6708500	1
99	O6/290	WAIP	329	Waipoua	2549300	6621200	2
100	Q7/58	NHBW	5	Northland Harbour Board Site, Whangarei	2631500	6605200	2
101	R10/25	SUN2	584	Sunde Site Oyster lens	2679700	6492000	1
102	R10/25	SUN3	401	Sunde Site soft shore midden	2679700	6492000	1
103	R11/898	WES1	21	Westfield N42/941	2674900	6473400	2
104	R11/142	HAML	12	Hamllins Hill N42/137	2673700	6473800	2
105	T11/242	HAHE	202	Hahei N44/215	2760700	6480800	2
106	T11/326	HARS	9	N44/97	2761100	6480300	1
107	T12/192	ORUR	6	Oruarangi N49/28	2739400	6439500	2
108	T13/13	RAUP	25	Raupa N53/37, T13/13	2745200	6422100	2
109	R15/10	AOTE	35	Aotea N64/25	2667400	6356000	2
110	V15/80	KOHI	184	Kohika N68/104	2842900	6358800	2
111	N26/18	AWAR	32	Awaroa N26/18	2511700	6038300	2
112	N26/214	BARB	261	N26/214	2510900	6014400	2
113	N26/16	BARK	50	Bark Bay	2514200	6032200	2
114	N25/50	TAUP	11	Taupo Point	2506100	6046400	2
115	N27/118	APPL	128	Appleby	2520100	5988600	1
116	O27/56	HAUL	25	Haulashore Island	2531600	5993000	2
117	G36/1	BRUC	54	Bruce Bay	2233200	5728200	1
118	W21/1	TIRO	6	Tiromoana N135/1	2852300	6165500	2
119	S28/68	PAR2	36	Pararaki Wall, Pararaki North N168-9/41	2694200	5961600	1
120	J43/4	PLE1	54	Pleasant River (Anthropology) S155/8	2332500	5512800	1
121	J43/4	PLE2	145	Pleasant River (Smith)	2332500	5512800	1
122	J43/4	TUMA	106	Tumai, Pleasant River Mouth South	2332500	5512800	1
123	I44/17	MAPO	140	Mapoutahi S164/13	2324400	5494300	2
124	J44/4	PUKE	105	Pukekura Pa, Taiaroa Head	2333100	5490100	2
125	G47/50	PAP2	29	Papatowai S184/5	2239800	5399600	1
126	E48/29	WES2	63	West Point WP/1, Ruapuke Island	2164300	5371700	2

**Total MNI 40433**

No	Family	Common Name	NMI
1	Anguillidae	Freshwater eels	131
2	Aplodactylidae	Marblefish	48
3	Arripidae	Kahawai	481
4	Carangidae	Trevally, etc.	603
5	Triglidae	Red gurnard	170
6	Sparidae	Snapper	6346
7	Congridae	Conger eel	192
8	Chondrichthyes/Elasmobranchs	Sharks, etc.	224
9	Ophidiidae	Ling	713
10	Scorpaenidae	Scarpee, etc.	542
11	Uranoscopidae	Giant stargazer	4
12	Latrididae	Blue moki, etc.	473
13	Leptoscopidae	Estuarine stargazer	9
14	Moridae	Red cod, etc.	3685
15	Balistidae	Leatherjacket	712
16	Cheilodactylidae	Tarakihi, etc.	990
17	Nototheniidae	Maori chief	316
18	Odacidae	Greenbone	2967
19	Mugiloididae	Blue cod	6664
20	Pleuronectidae	Flounder, etc.	27
21	Percichthyidae	Groper	238
22	Labridae	Spotty, etc.	4259
23	Gempylidae	Barracouta, etc.	10075
24	Scombridae	Blue mackerel, etc.	26
25	Kyphosidae	Parore, etc.	11
26	Centrolophidae	Blue warehou	22



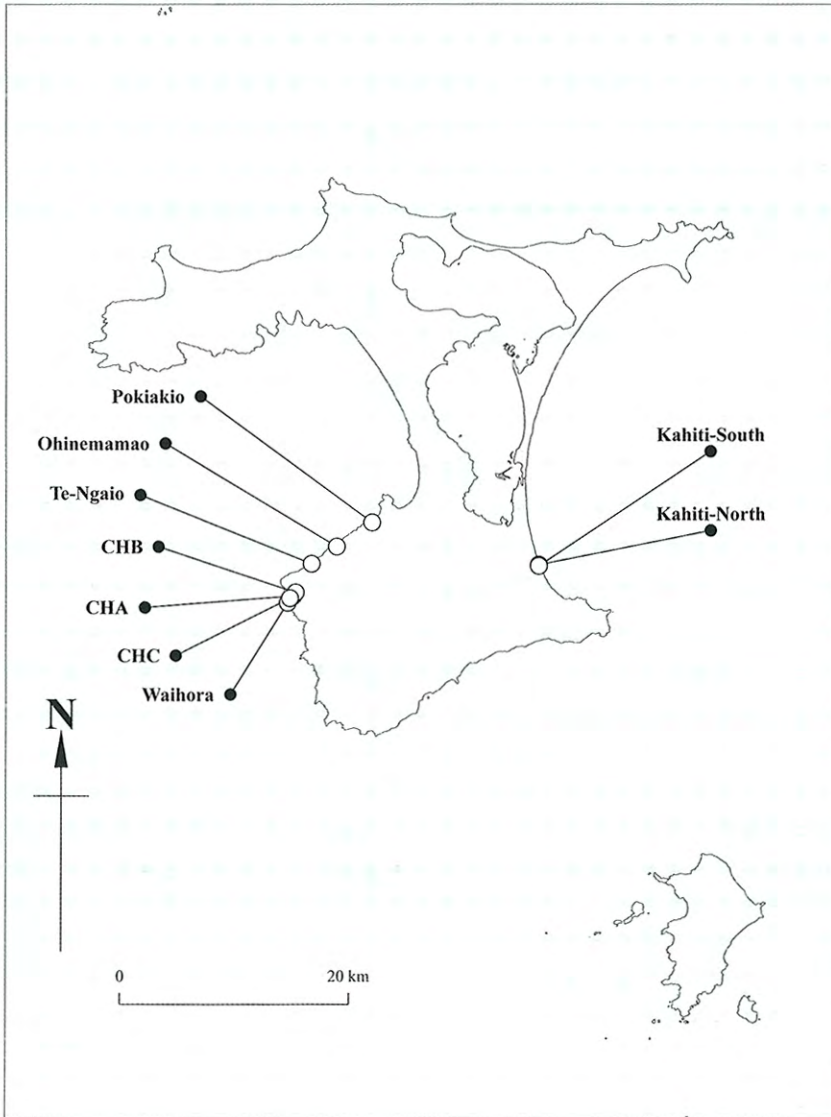


FIGURE A.2

Location of archaeological sites in the Chatham Islands included in the database.

MATRIX OF MINI VALUES  
FAMILY

Site	1	2	3	4	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	31	32	33	34	35	36	MINI	
1	0	0	0	0	0	2	5	0	18	300	4	3	0	64	0	118	1	0	118	3	1	402	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1153
2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
3	0	0	0	8	0	0	3	0	0	11	0	0	11	6	0	0	23	0	23	0	2	25	29	0	0	0	0	0	0	0	0	0	0	0	0	0	125	
4	0	0	0	0	0	0	3	0	0	0	0	2	0	1	0	2	13	0	21	0	21	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	
5	0	0	0	0	0	3	1	0	2	45	0	0	0	6	1	25	0	0	61	0	1	66	8	0	0	0	0	0	0	0	0	0	0	0	0	0	219	
6	0	0	0	0	0	3	39	0	4	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	54		
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8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	270		
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11	0	0	0	1	0	43	0	1	0	0	0	2	0	8	0	0	2	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65		
12	3	0	7	1	0	166	0	1	0	0	0	5	0	3	47	19	0	0	4	0	0	19	2	0	0	0	1	0	0	0	0	0	0	0	0	278		
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17	24	0	0	0	0	0	8	8	1	0	0	10	7	0	0	54	0	1	41	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	159		
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19	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	8		
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27	1	0	0	0	0	0	0	2	3	0	0	0	0	4	0	0	0	0	5	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	
28	0	0	0	0	0	0	0	0	15	0	0	0	0	4	0	0	0	0	0	3	0	96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	118	
29	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	
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31	0	2	17	8	2	31	7	7	0	0	0	10	0	6	0	4	0	5	3	1	0	25	12	0	0	0	0	0	0	0	0	0	0	0	0	0	147	
32	0	0	0	0	0	0	0	0	5	0	0	1	0	23	0	0	0	0	5	0	8	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114	
33	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
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35	0	0	0	0	0	0	0	0	0	16	0	0	0	9	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
36	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	3	0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	54
37	0	0	16	0	0	15	0	3	0	0	0	1	0	6	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	45	
38	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
39	0	0	0	0	0	0	0	0	5	1	2	0	6	0	20	0	39	0	27	0	2	24	17	0	0	0	0	0	0	0	0	0	0	0	0	0	144	

MATRIX OF MINI VALUES  
FAMILY (cont.)

Site	1	2	3	4	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	31	32	33	34	35	36	MINI	
40	0	0	0	0	0	0	1	0	1	0	0	5	0	1	0	0	0	0	4	0	0	51	151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	214
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
42	0	0	0	0	0	0	0	1	8	4	0	3	0	0	0	1	0	2	20	0	4	8	313	0	0	0	0	0	0	0	0	0	0	0	0	0	0	364
43	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	2	6	0	0	68	21	0	0	0	1	0	0	0	0	0	0	0	0	0	105	
44	0	0	0	0	0	0	7	4	13	5	0	15	0	16	3	9	1	3	96	0	0	240	30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	443
45	0	0	0	0	0	0	4	0	6	1	0	1	0	12	0	2	0	1	18	0	0	31	10	0	0	0	0	0	0	0	0	0	0	0	0	0	86	
46	0	0	0	0	0	2	2	0	6	4	0	2	0	14	0	4	0	0	26	0	0	55	5	0	0	0	0	0	0	0	0	0	0	0	0	0	120	
47	0	1	0	0	0	0	4	0	3	1	0	3	0	4	2	4	0	3	17	0	0	138	5	0	0	0	0	0	0	0	0	0	0	0	0	0	185	
48	0	0	0	0	0	0	4	0	2	1	0	6	0	1	0	2	0	1	20	0	0	71	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	111
49	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
51	0	0	2	3	23	96	0	11	0	0	0	0	0	0	0	0	0	4	0	0	4	10	0	0	0	0	1	2	0	0	0	0	0	0	0	0	156	
52	0	0	1	1	4	119	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	128	
53	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	2	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	40	
54	0	0	1	0	0	0	0	10	1	0	0	1	0	2	0	1	0	0	0	0	5	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	130	
55	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	
58	0	0	0	0	0	3	2	0	0	0	0	0	0	11	2	0	0	0	2	0	0	3	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	103
59	0	0	0	0	1	0	1	1	28	0	0	0	0	37	0	0	0	0	17	7	0	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	94	
60	0	0	0	0	0	0	0	0	3	2	0	0	0	4	0	0	0	0	0	0	2	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	54	
61	1	0	0	0	0	0	2	0	14	0	0	0	0	30	0	0	2	0	26	0	0	4	13	0	0	0	0	0	0	0	0	0	0	0	0	0	2134	
62	29	0	0	0	0	10	0	12	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	844	
63	1	0	0	0	1	0	0	57	20	0	0	30	0	339	0	2	46	0	155	0	11	116	1354	0	0	1	0	0	1	0	0	0	0	0	0	0	0	132
64	0	1	61	67	70	429	0	6	1	6	0	12	0	5	19	20	0	9	4	2	0	109	8	1	6	0	0	0	6	0	0	0	0	0	0	0	771	
65	0	0	1	77	13	1	0	8	0	0	0	1	0	0	0	0	0	0	9	0	4	4	10	2	0	2	0	0	0	0	0	0	0	0	0	0	5	
66	37	2	63	53	16	37	5	21	1	8	0	20	0	100	1	136	0	10	29	0	10	151	53	0	0	10	0	0	0	5	2	1	0	0	0	0	9	
67	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
68	0	1	0	0	0	0	2	2	0	1	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	
69	0	1	0	0	0	6	4	2	2	1	0	6	0	3	0	9	0	18	8	0	1	21	1	0	0	0	1	0	0	0	0	0	0	0	0	0	191	
70	0	10	20	4	1	10	15	22	0	41	0	29	0	31	0	55	1	75	36	0	13	278	56	0	0	0	1	0	0	0	0	0	0	0	0	0	705	
71	0	0	1	0	0	0	0	1	0	5	0	0	0	2	0	1	0	1	0	0	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	
73	0	4	40	11	0	155	2	5	0	3	0	10	0	1	70	20	0	8	35	0	1	224	5	0	0	0	1	0	0	0	0	0	1	0	0	0	596	
74	2	18	42	18	4	140	50	51	6	21	0	96	0	5	55	37	0	126	111	0	19	299	72	2	0	0	7	2	0	2	0	7	14	0	0	1206		
75	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
76	0	0	0	0	0	0	0	0	0	9	0	1	0	106	0	0	0	0	1	0	36	0	300	0	0	0	0	0	0	0	0	0	0	0	0	0	453	
77	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	2	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	13	
78	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	4	6	10	0	0	0	0	1	0	0	0	0	0	0	0	0	25	

MATRIX OF MNI VALUES  
FAMILY (cont.)

Site	1	2	3	4	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	31	32	33	34	35	36	MNI
79	0	0	0	0	0	0	0	0	6	0	0	0	9	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	27
80	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
81	0	0	0	0	0	0	0	0	0	13	1	0	35	0	0	0	0	0	5	1	0	4	368	0	0	0	0	0	0	0	0	0	0	0	0	0	428
82	0	0	0	0	0	0	0	0	0	0	0	4	1273	0	0	0	0	0	0	2	9	27	1318	0	0	0	0	0	0	1	0	0	0	0	0	0	2745
83	1	0	0	0	0	0	0	0	4	0	0	0	1	0	0	2	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
84	1	0	2	2	4	235	7	0	11	3	0	17	40	56	20	0	1	11	0	0	60	103	0	0	0	0	0	0	0	0	0	2	3	2	0	585	
85	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
86	0	0	8	7	0	83	0	0	0	0	0	0	0	0	92	0	0	9	0	0	4	2	0	0	0	0	0	0	0	0	0	26	0	0	0	231	
87	0	0	2	0	0	8	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	13	
88	0	0	7	0	1	28	0	1	0	0	0	3	0	0	9	0	0	1	0	0	12	0	0	0	0	0	6	2	0	0	0	0	0	0	0	70	
89	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
90	0	0	9	4	1	248	0	0	0	1	0	0	0	0	167	1	0	0	1	0	46	2	0	0	0	0	0	0	0	0	0	0	0	1	0	481	
91	14	2	0	9	1	0	11	0	8	3	0	74	0	60	6	73	67	1195	1763	0	8	801	39	0	0	0	0	0	0	0	11	0	3	14	0	35	4197
92	1	0	0	0	0	0	0	0	0	0	0	9	0	0	0	21	14	147	602	0	1	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	884
93	4	0	0	0	0	0	16	0	4	0	0	22	0	5	30	183	116	1288	3066	0	2	242	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4978
94	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
95	0	0	2	0	0	3	1	0	10	0	0	0	0	36	0	0	1	0	0	2	5	5	0	0	0	0	0	1	0	0	2	0	0	0	0	68	
96	0	0	11	3	1	592	0	0	0	0	0	0	0	0	1	6	0	0	1	0	18	0	0	0	0	0	0	1	0	0	0	0	0	0	1	635	
97	0	0	2	0	0	9	0	0	0	0	0	0	0	0	1	1	0	0	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	18	
98	1	0	55	143	1	2207	0	0	0	0	0	2	0	1	3	3	0	0	1	0	0	2	2	0	0	1	0	0	0	0	0	0	0	0	0	2425	
99	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	329	
100	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
101	1	0	0	11	0	390	0	0	0	0	0	0	0	1	1	1	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	584	
102	1	0	1	2	1	386	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	1	0	0	0	0	0	1	4	0	0	0	0	0	0	401	
103	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	
104	0	0	0	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	12	
105	0	0	1	0	3	20	0	0	0	0	0	4	0	1	133	7	0	1	3	0	26	1	0	2	0	2	0	0	0	0	0	0	0	0	0	202	
106	0	0	0	0	0	4	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
107	0	0	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
108	1	0	3	2	3	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	25	
109	1	0	1	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0	0	0	0	0	1	0	0	0	0	0	0	35	
110	0	0	23	120	2	14	0	0	0	0	0	0	1	0	2	2	0	0	1	0	1	1	2	9	0	0	0	0	0	0	0	0	0	0	0	184	
111	0	0	0	0	0	0	0	0	1	0	0	0	0	12	0	5	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	32	
112	0	0	0	0	1	2	0	0	7	0	0	3	0	85	0	11	0	0	0	0	4	147	1	0	0	0	0	0	0	0	0	0	0	0	0	261	
113	0	0	0	0	0	1	0	0	1	0	0	0	0	25	0	4	0	0	0	0	1	18	0	0	0	0	0	0	0	0	0	0	0	0	0	50	
114	0	0	0	0	0	0	0	0	1	0	0	0	0	5	0	1	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	11	
115	0	0	2	6	3	3	0	0	0	1	0	1	0	79	0	4	0	0	7	1	0	1	19	0	0	0	0	0	2	0	0	0	0	0	0	128	
116	0	0	0	1	0	9	0	0	1	1	0	1	0	5	0	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	25	
117	0	0	0	0	0	0	0	0	1	0	0	0	0	24	0	18	0	0	0	0	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	54	



MATRIX OF MINI VALUES  
FAMILY (cont.)

Site	1	2	3	4	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	31	32	33	34	35	36	MINI	
118	0	0	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
119	0	0	0	2	0	1	2	0	0	4	0	2	0	2	0	5	0	1	3	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36
120	0	2	0	0	0	0	0	0	5	0	0	0	0	15	0	0	2	0	7	0	0	6	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
121	0	0	0	2	0	0	0	1	0	0	0	0	0	28	0	2	5	0	22	0	0	4	81	0	0	0	0	0	0	0	0	0	0	0	0	0	145	
122	0	2	0	0	3	0	0	0	3	1	0	2	0	18	0	0	5	0	15	0	0	4	53	0	0	0	0	0	0	0	0	0	0	0	0	0	106	
123	0	0	0	0	0	0	0	0	9	0	0	0	0	75	0	0	0	0	1	0	3	4	48	0	0	0	0	0	0	0	0	0	0	0	0	0	140	
124	0	0	0	0	0	0	0	0	3	0	0	0	0	9	0	0	0	0	0	0	0	93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105	
125	0	0	0	0	0	1	0	0	1	0	0	1	0	3	0	0	0	0	1	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	29	
126	0	0	0	0	0	0	0	0	0	1	0	6	0	3	0	1	0	2	26	0	1	13	10	0	0	0	0	0	0	0	0	0	0	0	0	0	63	
MINI	131	48	481	603	170	6346	192	224	713	542	4	473	9	3685	712	990	316	2967	6664	27	238	4259	10075	26	11	22	141	29	192	21	9	39	34	2	3	35	40433	