Appendix A.4.1

RPS 2006 Bird Survey Report

A.4.1

APPENDIX 5.5 – ORNITHOLOGY SURVEY OF RIVER CORRIB CROSSING 2005-6

Bird Survey Work for the Proposed Galway City Outer Bypass in the Menlo – Kentfield area, Galway, August 2005 – July 2006

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1. Introduction

The study was designed to monitor the birds flying through an area on the River Corrib at which it is proposed to build a river crossing that will form part of the proposed Galway City Outer Bypass (GCOB). This monitoring was intended to give data on the species and numbers of birds that might pass the bridge once it was built and to allow an assessment of the possible risk of avian mortality that might be caused by bird strike incidents at the bridge. In addition, the birds noted in the wider area around the proposed bridge crossing were also recorded.

1.1 Survey Site

The proposed crossing point on the eastern bank of the River Corrib (Grid Ref: E128165 N228152) is 140 metres south of Menlo graveyard and 400 metres northwest of the ruined Menlo Castle. The bank consists of limestone boulders with a thin layer of calcareous soil covered by limestone grassland. Approximately ten to fifteen metres back from the crossing point on the bank there is a partly exposed limestone outcrop perhaps three or four metres higher than the riverbank. This outcrop is covered by semi-natural Oak-Ash-Hazel woodland with Ash (*Fraxinus excelsior*), Hazel (*Corylus avellana*), Irish Whitebeam (*Sorbus hibernica*), Holly (*Ilex aquifolium*), Hawthorn (*Crataegus monogyna*), Rowan (*Sorbus aucuparia*), non-native Beech (*Fagus sylvatica*) and a rich ground flora.

The proposed west bank crossing point (Grid Ref. E128068 N228180) is approximately 200 metres northeast of the end of Chestnut Lane. The bank is covered by a reedswamp fringe, with a floating scraw at the water's edge and a flora consisting of Reed (*Phragmites australis*), Common Club-rush (*Schoenoplectus lacustris*), Bulrush (*Typha latifolia*), Saw Sedge (*Cladium mariscus*) and floating Bogbean (*Menyanthes trifoliata*) and Yellow Waterlily (*Nuphar lutea*). The ground behind the riverbank is covered with marsh and wet grassland, the soil being wet and peaty. In some areas acid-loving plants like heathers, Bog Asphodel (*Narthecium ossifragum*) and Bog Myrtle (*Myrica gale*) can be found.

The river at the proposed crossing point runs approximately North-South and the southern end of Lough Corrib is only 200 metres to the north. The crossing itself is aligned approximately in an east-southeast to west-northwest direction (i.e. the western crossing point is slightly upstream of the eastern crossing point). The length of the crossing is approximately 100 metres. Cattle currently graze both sides of the crossing. The whole of the river at the site is part of the Lough Corrib candidate Special Area of Conservation (cSAC; Site Code 000297) and proposed Natural Heritage Area (pNHA; Site Code 000297) and the banks on both sides of the crossing are part of the cSAC. The crossing area (overlain by the proposed bridge and road route) is shown in Figure 1.1 below.

The wider area around the proposed crossing point, i.e. the Menlo area (including the pier and around the castle etc.) and Kentfield area on the western bank of the river, was also covered during the survey work in order to obtain baseline data on the avifauna of the section of the cSAC that surrounds it.

1.2 Bridge Design

The proposed bridge design is for an extradosed bridge using two concrete pylons. The preferred design specifies a span of 150 metres between the piers. The design requires that the piers will have a height of 12.5 metres above the roadway. The pylons will be positioned along the centre line of the bridge with the carriageways running on either side. An array of seven tendons will run

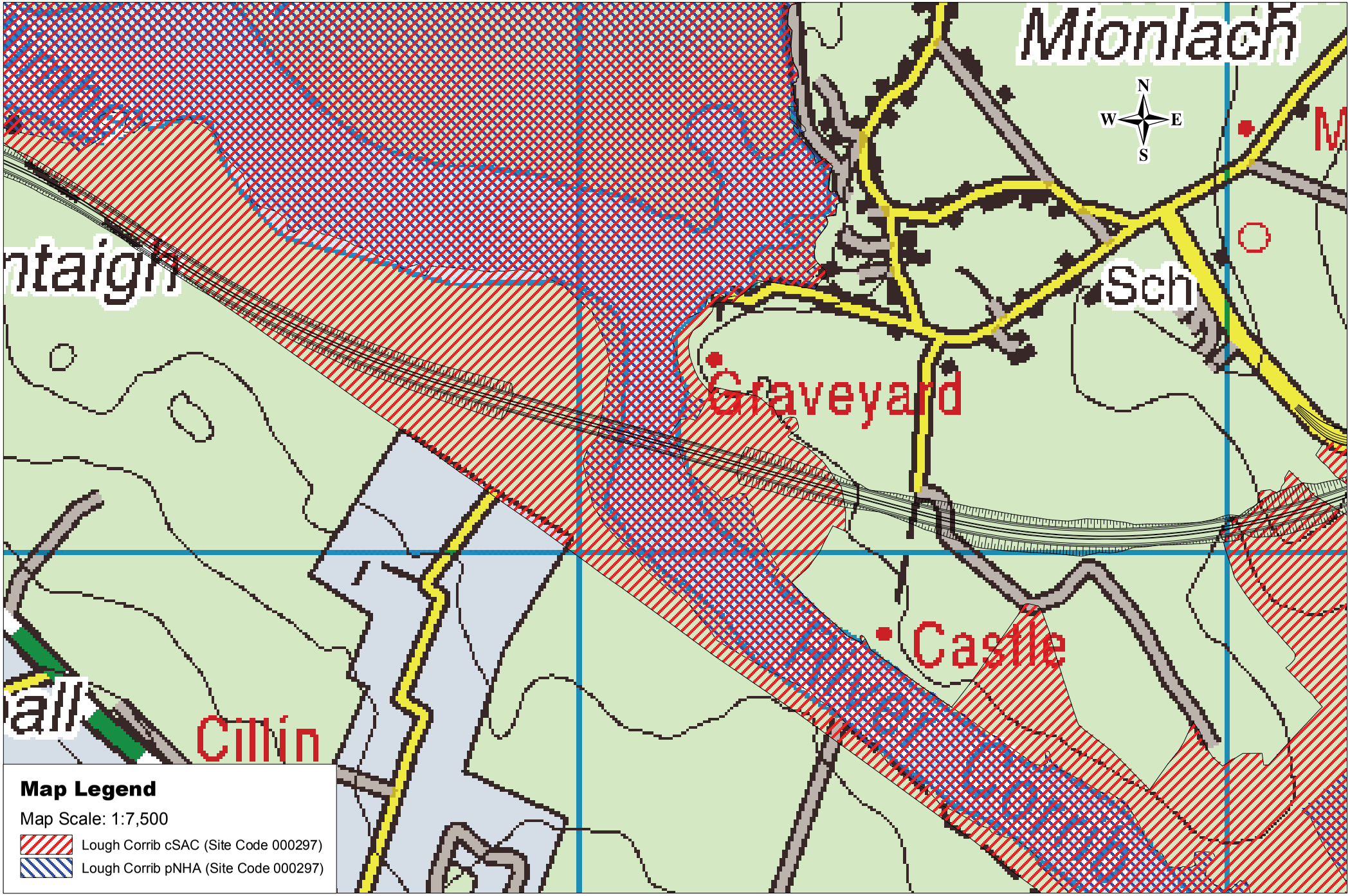

Figure 1.1 Bridge route and crossing site at the River Corrib, Menlo, Co. Galway

from either side of each pylon, although the two arrays that will run towards the centre of the bridge will be twin sets of tendons (i.e. 14 single tendons running away from the centre of the bridge and 28 paired tendons running towards the centre, giving a total of 42), and these tendons will bear the main load of the bridge structure. The external diameter of the tendon sheaths used will be in the region of 200 to 250 millimetres. The bridge roadway will be approximately 3 metres in depth and 30 metres wide. The height between the bottom of the roadway and the water surface will vary with the flow of the River Corrib, but it can be taken to be approximately equal to 6 metres. A drawing of the bridge design is included as Appendix 1 to this report.

2. Methodology

Survey work was started on the 5th of August 2005. It was decided to survey for one calendar year, with one two-hour watch to be carried out per week (i.e. 52 watches and 104 hours in total). At the time of writing, 48 of these watches have been completed. The watches were conducted from a fixed point (or vantage point, VP) on the riverbank and have been conducted at different times of day (i.e. between sunrise and sunset), in order to cover the whole range of conditions that apply to the area. The VP that was used during the watches was at the eastern bank crossing point (Grid Ref: E128165 N228152).

Birds that passed through the vicinity of the proposed bridge crossing were identified and counted, and their flight path and altitude were also recorded. The pieces of optical equipment used were a pair of Swarovski EL 8.5 X 42 binoculars and a Swarovski AT 80 HD telescope with a 20-60 X zoom eyepiece. Flight path or flight direction was calculated visually with the aid of a compass. With a field method like this it is not possible to measure the direction of flight with complete accuracy and the direction was noted on a recording sheet using the points of the compass (e.g. N, S, E, W, SE, NW etc.). The flight paths of birds can be complex and can change rapidly, depending on the behaviour of the bird or birds in question. For example, birds can completely change direction and in some cases the same individual crossed and recrossed the crossing area several times. The altitude or height of flight was calculated with reference to local landscape features (e.g. rock outcrops or groups of trees), the heights of which above riverbank level had been previously determined with the aid of a clinometer. Since the height at which a bird is flying can also change rapidly, the height was estimated every five seconds.

Each record of a bird or flock or birds was noted on field sheets. Apart from weather conditions, species, number, flight direction and height, notes were also taken as to where a bird crossed the river, so that it would be possible to know later whether a bird had flown through (or along) the line of the crossing or not. The crossing area was taken as the area fifteen metres either side of a line from one crossing point to the other (i.e. to account for bridge that will be 30 metres wide). In addition, the river area was divided into parallel zones corresponding to the middle third of the river, the eastern side of the crossing (including the area immediately behind the bank and the river by that bank) and the western side of the crossing (as for the eastern section). This division into zones made it possible to say if a bird or birds had not only passed through (or over) the crossing, but also what part of the crossing line it had passed through. The paper records of the birds that had flown through the crossing area have been digitised and these data are included as Appendix 2 to this report.

3. Birds in the local area

3.1 Birds recorded during the watches

In total, 78 species of birds were recorded during the course of the 52 watches (104 hours of observations) undertaken so far. In addition to birds that flew through the crossing area, birds that were seen in trees and vegetation while watching, those that were heard in song, those that were seen on the river, and those seen in flight, but which did not fly through the crossing area, are included in the list, which is shown in Table 3.1 below. The conservation status and local status of each species is also shown and the status codes used are explained in Table 3.2 below.

Table3.1: List of all species recorded during the survey work

Common Name	Scientific Name	BTO Code	Status
Great Crested Grebe	*Podiceps cristatus*	GG	R, F, LB
Little Grebe	*Tachybaptus ruficollis*	LG	R, F, LB
Cormorant	*Phalacrocorax carbo*	CA	R, C, F
Grey Heron	*Ardea cinerea*	H.	R, C, F
Mute Swan	*Cygnus olor*	MS	R, F, LB
Mallard	*Anas platyrhynchos*	MA	R, F, LB
Tufted Duck	*Aythya fuligula*	TU	R(W), LB?
Red-breasted Merganser	*Mergus serrator*	RM	R, C
Sparrowhawk	*Accipiter nisus*	SH	R, C, F, LB?
Hen Harrier	*Circus cyaneus*	HH	BD, RL, W, F
Merlin	*Falco columbarius*	ML	BD, W, C
Kestrel	*Falco tinnunculus*	K.	R, F, LB
Pheasant	*Phasianus colchicus*	PH	R, F
Water Rail	*Rallus aquaticus*	WR	R, F, LB?
Moorhen	*Gallinula chloropus*	MH	R, F, LB
Coot	*Fulica atra*	CO	R, F, LB
Oystercatcher	*Haematopus ostralegus*	OC	R, C
Lapwing	*Vanellus vanellus*	L.	RL, R(W), C
Dunlin	*Calidris alpina*	DN	W, C
Common Sandpiper	*Actitis hypoleucos*	CS	S
Spotted Sandpiper	*Actitis macularia*	PQ	V
Curlew	*Numenius arquata*	CU	RL, W, C, F
Whimbrel	*Numenius phaeopus*	WM	SM, AM, C
Snipe	*Gallinago gallinago*	SN	W, C, F
Black-headed Gull	*Larus ridibundus*	BH	R, C, F
Little Gull	*Larus minutus*	LU	BD, OCC
Common Gull	*Larus canus*	CM	R, C, F
Herring Gull	*Larus argentatus*	HG	R(W), C
Lesser Black-backed Gull	*Larus fuscus*	LB	W, C
Great Black-backed Gull	*Larus marinus*	GB	R(W), C
Common Tern	*Sterna hirundo*	CN	BD, S, C, F
Feral Pigeon	*Columba livia*	FP	R, C, LB?
Stock Dove	*Columba oenas*	SD	R, C, F, LB?
Wood Pigeon	*Columba palumbus*	WP	R, C, F, LB
Collared Dove	*Streptopelia decaocto*	CD	R, C, F, LB?
Cuckoo	*Cuculus canorus*	CU	S, F, LB
Barn Owl	*Tyto alba*	BO	
Swift	*Apus apus*	SI	S, C, F, LB?
Swallow	*Hirundo rustica*	SL	S, C, F, LB?
Sand Martin	*Riparia riparia*	SM	S, C, F
House Martin	*Delichon urbica*	HM	S, C, F, LB?
Meadow Pipit	*Anthus pratensis*	MP	R, F, LB
Pied Wagtail	*Motacilla alba yarrelli*	PW	R, C, F, LB
Grey Wagtail	*Motacilla cinerea*	GL	R, C, F, LB?
Starling	*Sturnus vulgaris*	SG	R, C, F
Dunnock	*Prunella modularis*	D.	R, LB

Common Name	Scientific Name	BTO Code	Status
Wren	*Troglodytes troglodytes*	WR	R, F, LB
Grasshopper Warbler	*Locustella naevia*	GH	S, F, LB
Sedge Warbler	*Acrocephalus schoenobaenus*	SW	S, F, LB
Willow Warbler	*Phylloscopus trochilus*	WW	S, F, LB
Chiffchaff	*Phylloscopus collybita*	CC	S, F, LB
Goldcrest	*Regulus regulus*	GC	S, F, LB
Whitethroat	*Sylvia communis*	WH	S, F, LB
Blackcap	*Sylvia atricapilla*	BC	S, F, LB
Stonechat	*Saxicola torquata*	SC	R, LB?
Robin	*Erithacus rubecula*	R.	R, LB
Blackbird	*Turdus merula*	B.	R, LB
Fieldfare	*Turdus pilaris*	FF	W, C, F
Redwing	*Turdus iliacus*	RE	W, C, F
Song Thrush	*Turdus philomela*	ST	R, F, LB
Mistle Thrush	*Turdus viscivorus*	M.	R, F, LB
Blue Tit	*Parus caeruleus*	BT	R, F, LB
Great Tit	*Parus major*	GT	R, F, LB
Coal Tit	*Parus ater*	CT	R, F, LB
Long-tailed Tit	*Aegithalos caudatus*	LT	R, F, LB
Treecreeper	*Certhia familiaris*	TC	R, F, LB?
Reed Bunting	*Emberiza schoeniclus*	RB	S, F, LB
Chaffinch	*Fringilla coelebs*	CH	R, F, LB
Goldfinch	*Carduelis carduelis*	GO	R, F, LB
Greenfinch	*Carduelis chloris*	GR	R, F, LB
Bullfinch	*Pyrrhula pyrrhula*	BF	R, F, LB
Lesser Redpoll	*Carduelis cabaret*	LR	R, C, F
Linnet	*Carduelis cannabina*	LI	R, F, LB?
Jay	*Garrulus glandarius*	J.	R, C
Magpie	*Pica pica*	MG	R, C, F, LB
Jackdaw	*Corvus monedula*	JD	R, C, F, LB
Raven	*Corvus corax*	RN	R, C
Hooded Crow	*Corvus cornix*	HC	R, C, F, LB
Rook	*Corvus frugilegus*	RO	R, C, F, LB

Table 3.2: Explanation of conservation and local status codes

Code	
BD	EU Birds Directive Annex I species
RL	BoCCI Red List
R	Resident
S	Summer visitor
W	Winter visitor
R(W)	Resident, but numbers augmented by birds from abroad in winter.
SM	Spring migrant
AM	Autumn migrant
C	Species commutes through the study area.
F	Species feeds/hunts/forages in the study area.
LB	Local breeder
LB?	Possible local breeder
OCC	Occasional
V	Vagrant

The birds species recorded included many waterbirds like grebe, cormorant, swans, ducks, rails, terns, gulls and waders, but land birds like pigeons, cuckoo and many passerines (sparrow-like perching birds) were also recorded. The land birds recorded during the watches were often associated with the wooded and grassland areas on either side of the crossing, whereas it was in the main the waterbirds that were using the river for feeding, nesting or commuting. Small numbers of waterbirds, including Little Grebe, Mute Swan, Mallard, Coot and Moorhen, breed on the river in the area. In addition, species like Reed Bunting, Sedge Warbler and Grasshopper Warbler breed in the riparian vegetation, while Meadow Pipit breed in the grassland areas on the western side of the

proposed crossing and common woodland and hedgerow birds breed in the woodlands on the eastern side.

Four species listed in Annex I of the EU Birds Directive (CEC, 1979) and two species listed in the Birds of Conservation Concern in Ireland (BoCCI; Newton *et al*., 1999) Red List were recorded. All six of these conservation-listed species were involved in flights through the proposed bridge crossing area (see Table 3.5 below).

3.2 Species recorded in flight through the crossing area

3.2.1 Analysis

A simple analysis of the records of the bird flights through the crossing area has been carried out. A bird flight has been defined as a single bird, group or flock of birds flying together in the same direction and at the same approximate height. The bird flights were classified as either having passed through safe zones (i.e. the birds involved could not have collided with any part of the bridge), or as having passed through 'danger zones' (i.e. through areas that were close to the sites of the components of the proposed bridge). It should be remembered, however, that no allowance was made for birds seeing any built bridge structure and taking appropriate avoiding action.

Safe areas were defined as any line through the crossing area at heights less than 6 metres above the river ('under the bridge'), any line through the central zone of the crossing at heights greater than 10 metres ('over the middle of the bridge'), any line over the riverbank zones (both eastern and western) at heights greater than 25 metres ('over the bridge pylons'), or any line along the crossing at heights greater than 25 metres ('over the length of the bridge').

The 'danger zones' were defined as any line through the crossing at heights between 6 and 10 metres (corresponding to the profile of the roadway), any line over the riverbank zones at heights between 6 and 25 metres (corresponding to the profile of the two bridge pylons and the tendons radiating down towards the roadway from them) and any line along the bridge at heights less than 25 metres (corresponding to the longitudinal profile of the piers and roadway). The height of the bridge piers has been taken to be 21.5 metres (i.e. 6 metres below the roadway, a 3 metre deep roadway and piers that are 12.5 metres high), but an approximate bridge height of 25 metres was used in order to err on the side of safety.

3.2.2 Results

Table 3.3 below shows the simple figures for the total numbers of flights and individual birds that passed through the crossing area during the watches that have been completed to date. Table 3.4 shows a more detailed breakdown of the zones through which the bird flights passed.

Table 3.3: Totals of flights and individual birds through the crossing area

Parameter	Total	Mean (per watch)	Median	Mean (per hour)
Flights through crossing	1,391	26.8	26	13.4
Birds through crossing	4,725	90.9	42.5	45.5
Flights through danger zones	619	11.9	11	6.0
Birds through danger zones	1,373	26.4	20	13.2
Flights through safe areas	772	14.8	13	7.4
Birds through safe areas	3,352	64.5	19.5	32.3

Table 3.4: Breakdown of the zones through which the flights passed

Parameter	Total flights	Total individuals
Through crossing area	1,391	4,725
Through 'danger zones'	619	1,373
Through bank 'danger zones'	182	501
Along bridge line 'danger zones'	235	439
Central 'danger zone'	202	433
Through safe zones	772	3,352
Safe under bridge	455	2,629
Safe over line of bridge	6	9
Safe over middle of bridge	238	566
Safe over bank 'danger zones'	27	88

Table 3.5 below shows the data broken down, for each of the 47 species recorded, for the numbers of flights and individuals that passed through the crossing area.

Table 3.5: Species recorded flying through the crossing area

Common Name	Total number of crossings	Total number of Individuals	Number of crossings through danger zones	Number of individuals through danger zones
Little Grebe	2	2	0	0
Cormorant	177	248	48	61
Grey Heron	20	22	5	7
Mute Swan	23	39	6	12
Mallard	137	220	39	73
Red-breasted Merganser	1	1	0	0
Sparrowhawk	7	7	7	7
Hen Harrier	1	1	1	1
Merlin	1	1	1	1
Kestrel	7	8	4	4
Moorhen	4	4	1	1
Coot	1	1	1	1
Oystercatcher	2	71	2	71
Lapwing	4	157	2	13
Dunlin	1	2	0	0
Curlew	2	2	1	1
Snipe	2	4	1	3
Black-headed Gull	409	810	160	401
Little Gull	1	1	1	1
Common Gull	93	130	38	55
Herring Gull	13	20	4	5
Lesser Black-backed Gull	7	8	3	3
Great Black-backed Gull	24	32	11	17
Common Tern	32	43	4	8
Wood Pigeon	111	146	79	104
Collared Dove	3	5	1	2
Swift	10	14	7	11
Swallow	63	167	26	84
Sand Martin	7	23	6	22
House Martin	12	80	7	40
Meadow Pipit	8	16	5	12
Pied Wagtail	7	8	5	6
Grey Wagtail	4	5	2	3
Starling	10	2,042	10	2,042
Redwing	3	19	3	19
Song Thrush	2	2	2	2
Mistle Thrush	2	2	2	2
Reed Bunting	5	5	2	2
Goldfinch	24	42	23	41
Greenfinch	6	7	6	7
Bullfinch	3	6	3	6
Lesser Redpoll	1	1	1	1
Great Tit	2	3	2	3
Magpie	16	19	15	18
Jackdaw	44	134	32	120
Hooded Crow	14	20	9	11
Rook	62	128	49	104

3.3 Species of conservation importance

3.3.1 Species that were recorded during the watches

Four species listed in Annex I of the EU Birds Directive have been recorded during the watches: Little Gull, Common Tern, Hen Harrier and Merlin.

Little Gull is a non-breeding visitor to Ireland. Madden and Ruttledge (1993) summarised the occurrence of this species in Galway from 1970 to 1991. Most records come from the Inner Galway Bay area, to the south of the crossing site. A single bird was recorded on the 23rd of December 2005 and there have been occasional records of birds as far north as Lough Corrib (e.g. one on the 18th August 2002, per BirdWatch Galway). Traditionally the majority of birds have been recorded between December and March after westerly or south-westerly winds. However, this bird is not found in great numbers in the area, which does not constitute a significant breeding, wintering or migration site for the species. Although it is of European conservation significance, Little Gull is not a significant part of the local bird population.

Common Tern is a summer visitor that has breeding colonies approximately 6 kilometres to the southeast of the site on Rabbit Island in Galway Bay and more than 5 kilometres to the north on islands in Lough Corrib (Hannon *et al.*, 1997; Mitchell *et al*., 2004). Even though the birds breeding on the Lough Corrib islands have the whole of the lake to hunt over, it is to be expected that they regularly commute to the sea, with the river forming an obvious corridor for these movements. Indeed, Common Terns are often seen on the River Corrib in Galway City. Eighteen flights of this species, involving 26 individuals, were recorded during the watches. The majority of the birds recorded were flying low over the river (often fishing in the area) and did not pass through the 'danger areas' of the proposed bridge.

Hen Harrier is a winter visitor to the Lough Corrib area, the nearest breeding area being in the Slieve Aughty hills, approximately 40 kilometres to the southeast. Survey work carried out during the first winter period of 2006 indicated that there were not any Hen Harrier winter roosts in the vicinity of the proposed road route. These birds use the reedbeds at the southern end of the lake as feeding grounds and they occasionally come as far south as the reeds on the west bank of the river. Two birds were seen from the VP on the 18th of November 2005 and three were seen on the 30th of December 2005. On the latter date one of the birds passed through the crossing area along the western bank of the river.

A single **Merlin** flew eastwards down the line of the crossing near dusk on the 16th of December 2005. No other individuals were noted in the wider area around the site during any of the watches. The nearest known breeding site of this species is approximately 5 kilometres to the north of the proposed bridge.

Curlew and **Lapwing**, both species that are listed in the BoCCI Red List, were recorded on occasion during the watches. However, the two species were included in the Red List because their Irish breeding populations have declined in recent years. Curlew and Lapwing were recorded in the area during winter only, when wintering birds from Britain and continental Europe supplement the local population. There is no indication of any breeding pairs of either of these waders in the immediate vicinity of the bridge site.

3.3.2 Species that could potentially occur in the area

The following species are listed in the NPWS site synopsis for the Lough Corrib SPA and could potentially be found in the area: Whooper Swan (*Cygnus cygnus*), Greenland White-fronted Goose (*Anser albifrons flavirostris*), Common Scoter (*Melanitta nigra*), Arctic Tern (*Sterna paradisaea*), Golden Plover (*Pluvialis apricaria*) and Kingfisher (*Alcedo atthis*). All of these species, except Common Scoter (which is listed in the BoCCI Red List), are listed in Annex I of the EU Birds Directive. None was recorded during the survey work.

Whooper Swan are regularly encountered on Lough Corrib, the mean count there over the five winter period from 2000/01 to 2004/05 being 18 and the peak count being 48 (I-W*e*BS count data from the Lower Lough Corrib count site, per BirdWatch Ireland). However, this species has rarely been reported from marine environments in Galway Bay. The majority of the Whooper Swan that winter in Ireland are probably from the Iceland breeding population. It is likely that they commute from place to place within Ireland during the winter by travelling from lake to lake and along rivers, although they can be seen grazing on agricultural land some distance from water. This highly visible species has not recently been recorded flying along the River Corrib and, since it is not on an obvious route from Lough Corrib to a known feeding site for the species, it does not seem likely that Whooper Swan often fly through the area.

There is a wintering population of **Greenland White-fronted Geese** on Lough Corrib, the mean count there over the five winter period from 2000/01 to 2004/05 being 73 and the peak count being 140 (I-W*e*BS count data from the Lower Lough Corrib count site, per BirdWatch Ireland). The history of goose flocks in the area is well-documented (Ruttledge and Ogilvie, 1979; Fox *et al*., 1994). One flock has traditionally used the lake islands and land around the River Clare on the eastern side of the lower lake, while another flock from Rahasane Turlough in the southeast has used the lower lake as a roosting site in the past. However, the bridge site does not lie on a logical flight line between the southern part of Lough Corrib and any known roosting sites. During winter the geese fly together just before sunset from their feeding grounds to their roosting site and they are particularly visible at this time. It seems unlikely that a flock of more than 50 birds would have been missed flying past the site during the winter of 2005/2006 (four of the watches between the beginning of October and the end of March finished at, or just after, sunset).

Small numbers of **Common Scoter** breed annually in the upper part of Lough Corrib (Gittings and Delany, 1996; Tierney *et al*., 2000) and small numbers are also present in winter in Galway Bay. It is not known what (if any) proportion of the local wintering population breeds on Lough Corrib, nor what route might be taken by individuals commuting from one site to another. However, wildfowl migrate during daylight where possible and this species has not been observed in the River Corrib area.

Like Common Tern, **Arctic Tern** is a summer visitor that breeds in small numbers on islands in Lough Corrib (Hannon *et al.*, 1997; Mitchell *et al*., 2004). The behaviour of this species is very like that of Common Tern and it is reasonable to assume that any impacts of the proposed bridge on this species will be the same as those for Common Tern.

Golden Plover is a winter visitor that can be found in some numbers on Lough Corrib, the mean count there over the five winter period from 2000/01 to 2004/05 being 1,823 and the peak count being 3,500 (I-W*e*BS count data from the Lower Lough Corrib count site, per BirdWatch Ireland). Substantial numbers also winter in the Oranmore Bay area of Inner Galway Bay, the mean count being 2,306 and the peak count being 7,280 (I-W*e*BS count data from the Barna-Oranmore section of the Inner Galway Bay count site, per BirdWatch Ireland). It is not known if there is any movement of birds between these two sites, or if the two wintering groups are separate. This species does fly

at night and can often be heard calling overhead after dark. However, these birds are generally flying at height making journeys of some distance; birds staying in one particular area in winter roost together in flocks at night.

Kingfisher is regularly seen on Lough Corrib and breed in the area (Gibbons *et al*., 1993). The birds often move from freshwater to the coast during the winter months and the individuals seen around Galway Bay in winter at places like Lough Atalia and Rusheen Bay may have moved downriver from the lake. They generally fly low (1 to 2 metres) over water and this species is not an obvious candidate for collision with a bridge or tower structure.

3.4 Important species in the wider area

One species of note that is found in the wider area around the site, but which has not been recorded during any of the watches, is **Barn Owl** (*Tyto alba*). Menlo Castle, 400 metres to the southeast of the crossing site, is a traditional breeding site for this BoCCI Red List species, and a pair has been in residence during the summer of 2006.

4. Discussion of the Results and Existing Literature

As can be seen from Table 3.3 above, the total numbers of bird flights recorded passing through the area of the proposed crossing were not large, with a mean of 13.4 flights per hour over the whole survey period (equivalent to one flight approximately every four or five minutes). It can also be seen that approximately 45% of the flights passed through areas that have been classified as 'danger zones' in that the birds flew close to areas that would be occupied by parts of the bridge structure were it to be built as is currently proposed. However, it is unlikely that the concrete parts of the bridge would constitute a serious source of avian collision danger, even though birds do collide with tall buildings. Rather, birds are more often known to collide with buildings that have a lot of clear glass, or fine structures like struts on communication towers, or (frequently) cables and overhead wires. Bearing this in mind, the estimate of the number of bird flights through the 'danger areas' must be taken as very much a 'worst case' scenario.

The most numerous species recorded passing through the crossing area was Starling. However, this fact is slightly misleading in that the vast majority of the Starlings recorded occurred in one flock numbering two thousand that passed through the area on evening in July 2005. Table 4.1 below redisplays some of the data from Table 3.5, showing the most frequently recorded species and also the total flights and numbers of individuals for the three groups of species that made up the majority of the sightings.

Table 4.1: Most frequently recorded species and bird groups in terms of numbers of flights and individuals through the crossing area

Species or Group	No. flights (No. individuals)
Black-headed Gull	409 (810)
Cormorant	177 (248)
Mallard	137 (220)
Wood Pigeon	111 (146)
Common Gull	93 (130)
Rook	62 (128)
Swallow	63 (167)
Jackdaw	44 (134)
Family Anatidae	161 (260)
Family Laridae	547 (1,001)
Order Passeriformes	295 (2,729*)

(* Including a single flock of 2,000 Starling)

It can be seen that the greatest number of flights through the proposed crossing area were made by gulls (family Laridae). The next largest number of flights was by passerine species (Order Passerformes), and a smaller number of flights were made by swans and ducks (Family Anatidae). As would be expected, the majority of the birds passing through the proposed crossing area were waterbirds that were using the river (cormorants, swans, ducks, gulls and terns). Many of the passerines that passed through the area crossed the river in east-west or west-east directions, rather than passing along it.

There is a well-known phenomenon of birds colliding with wires when in flight. Overhead power lines, other types of fine cabling and even fence wiring can be involved. Analyses of ringing recovery data from Ireland and Britain by the British Trust for Ornithology (BTO) have recorded high 'hit wire' indices for large waterfowl (like swans and geese) and soaring raptors (like Golden Eagle), and low indices for passerines (Rose and Baillie, 1992). The hit wire indices were calculated using data for bird collisions with all types of overhead line, including birds that had been electrocuted at power lines. There is a significant positive correlation between hit wire index and the average weight of the species. This effect may be due to the fact that manoeuvrability decreases with increasing size. Following this logic swans, geese and herons are all large aquatic

birds with a high vulnerability to wire collision. Overhead wires can be hard to see when the sun is behind them, in dim light conditions (e.g. at dawn or dusk, or in cloudy weather) and during heavy rainstorms, blizzards, or fog. A more recent review (Bevanger, 1998) has indicated that bird species with a high wing loading and a low aspect (including waterbirds, gulls and grouse) run a high risk of colliding with overhead wires. Swans, geese, ducks and soaring raptors are also considered to be susceptible to collision with wind turbines (Langston and Pullan, 2003; Stewart *et al*., 2005).

One can say, therefore, that the tendons are likely to be the structures on the proposed bridge that will represent the greatest danger of collision for birds and that (given the types of birds recorded during the survey work) herons, swans, ducks and gulls are the most likely to be affected. However, with a diameter in the 20-25 centimetre range, the bridge tendons will be considerably easier to see than guy wires or power lines that have diameters of less than 1 centimetre.

Table 4.2 below shows count data from the Irish Wetland Birds Survey (I-WeBS) for the five winters from 2000/01 to 2004/05. The data shown are for relevant species counted at I-WeBS count sites at the southern end of Lough Corrib and near to the mouth of the River Corrib (i.e. at either end of the river). There is a possibility that populations of the same species found in Lough Corrib and in Inner Galway Bay may commute from one site to the other using the river as a route and inspection of the data can give an indication of the types of waterbirds that may pass by the proposed bridge.

It can be seen that neither of the two species of wild goose found in the area (Greenland White-fronted and Light-bellied Brent) nor Whooper Swan are found in numbers at both sites and none of these species have recently been recorded close to the bridge site. Pochard, Tufted Duck and Coot are found in large and important numbers in Lower Lough Corrib, but not in Galway Bay. These species are winter visitors from the Far East; neither Galway Bay nor the River Corrib lie on their migration route to their winter quarters on Lough Corrib. It is not surprising that, of the three species, only small numbers of Coot (which has a small local breeding population) were recorded during the survey work. Species that are recorded in significant numbers during winter at both ends of the river include Cormorant, Grey Heron, Mute Swan, Wigeon, Mallard, Golden Plover, Lapwing, Curlew, Black-headed Gull and Common Gull. Unsurprisingly, most of these species (with the exception of Golden Plover) were recorded during the surveys.

Table 4.2: Mean and peak counts from the Lower Lough Corrib and Inner Galway Bay I-WeBS count areas, 2000/01 to 2004/05 (per BirdWatch Ireland)

Species	Mean and peak I-WeBS counts, 2000/01 to 2004/05	
	Lower Lough Corrib	Barna – Oranmore, Inner Galway Bay
Cormorant	60; 116	144; 199
Grey Heron	12; 17	48; 67
Mute Swan	382; 807	119; 152
Whooper Swan	18; 48	0; 0
Greenland White-fronted Goose	73; 140	0; 0
Light-bellied Brent Goose	0, 0	45; 67
Wigeon	199, 320	732; 1,174
Gadwall	11, 26	1; 5
Teal	39, 159	515; 806
Mallard	180, 358	186; 287
Shoveler	17, 36	4; 8
Pochard	10,271, 15, 650	0; 0
Tufted Duck	3,406, 7,250	2; 10
Scaup	1, 1	34; 73
Red-breasted Merganser	3, 8	42; 60
Coot	12,783, 20,444	0; 1
Oystercatcher	0, 2	275; 384
Golden Plover	1,823; 3,500	2,306; 7,280
Lapwing	1,386; 2,260	1,898; 3,491
Snipe	2, 5	6; 13
Curlew	32; 91	174; 263
Redshank	23; 31	275; 431
Black-headed Gull	119; 295	1,578; 2,388
Little Gull	0; 0	1; 5
Common Gull	29; 98	639; 1,819
Herring Gull	2; 5	154; 254
Lesser Black-backed Gull	0; 0	3, 7
Great Black-backed Gull	1; 1	34; 81

The I-WeBS data shown in Table 4.2 do not give any information about birds that are present in the area during summer. In addition to local breeding populations of terns, both Black-headed and Common Gulls breed on Lough Corrib (Whilde, 1978; Whilde *et al*., 1993).

Mute Swan is one of the heaviest species of flying bird (up to 14.5 kilograms) and is particularly susceptible to collision with wires and structures. The coloured balls or markers that were originally intended to make overhead wires visible to aircraft are often attached to low-level overhead wires where they lie on the flight paths of Mute Swans and a collision problem has been detected. Mute Swans generally do not migrate over long distances, but they have been recorded do so on occasions, both within Ireland and as far as Britain (Collins and Whelan, 1993; O'Halloran *et al*., 1995).

Good numbers of Mute Swan are found at both the mouth of the river (notably in the Claddagh area) and in Lough Corrib and there must be some movement of individuals between both areas. There are two pairs of Mute Swan that have territories close to the proposed crossing point. The territory of one pair runs from the Menlo castle area, downstream of the site, to a point about 75 metres upstream of it. The territory of another pair of swans lies upstream of the first pair, but also extends around behind the crossing area into Menlo pier. Only 23 (i.e. 1.7%) of the flights through the crossing area were made by Mute Swan. Most of these were low flights along the river and were below the levels at which the bridge tendons will be mounted.

Richard Collins, who has devoted part of his career to research into the behaviour of Mute Swans in Ireland, compiled a report on the implications of the proposed bridge crossing for possible swan mortality events for Ryan Hanley WSP in 2005. Referring to swan deaths as a result of collisions with man-made structures, Dr. Collins stated:

"*this mortality is sustainable and collisions are not a limiting factor on the swan population*".

An analysis of mortality in ringed swans in Dublin and Wicklow revealed that collisions accounted for 57% of the swan deaths whose cause was known and this was the largest identifiable cause of death in the region (Collins and Whelan, 1994). Of these fatal collisions, 72% were caused by overhead wires (i.e. power lines etc.), while only 10% were caused by bridges and 9% by other buildings. Other structures involved in fatal swan collisions included trees, lamp standards, vehicles, quays and a water tank. Dr. Collins was of the opinion that swan collisions with any design of bridge at the proposed crossing site should be infrequent, although he felt that designs with stays or tendons would be more difficult for swans to avoid than those without.

There is little published information on bird collisions with bridge structures, but during one Environmental Impact Assessment (EIA) carried out in Hong Kong (Ove Arup, 2002) the interactions of birds with three existing bridges in Hong Kong and one in Macau were studied. It was concluded that the impact of the existing bridges on local bird populations was negligible and it was suggested that the partly-cable stayed bridge that was proposed would also have a negligible impact on birds.

A cable-stayed bridge has recently been constructed over the River Boyne near to Drogheda, Co. Louth. An enquiry was made to Ms. Annette Lynch (local NPWS Conservation Ranger) in order to try to ascertain if any bird strike incidents had been reported at this new bridge. Ms. Lynch replied that no bird strike incidents had occurred to her knowledge and that the only recorded incident in the area had involved a Mute Swan striking ESB power lines before the bridge had been constructed. At Ms. Lynch's suggestion, Ms. Fiona Squibb of the Louth SPCA was also contacted. Ms. Squibb said that she had not been called out to any incidents involving injured birds at the new bridge.

5. Conclusions and Suggested Mitigation Measures

The existing information on bird strike incidents caused by cables indicates that an extradosed bridge with large (20 to 25 centimetre) diameter tendons constitute a low risk of causing significant numbers of bird strike casualties. However, it can be said that the selection of a design that did not require bridge cables would probably have reduced the risk of bird strike significantly. It seems that Mute Swan is the most likely species to be affected by virtue of its known susceptibility to striking overhead cables and other structures.

The risk that birds might fly into the bridge tendons is likely to be greatest either in darkness or during poor visibility (i.e. when dark objects will be difficult to see) or against pale skies or the sun (i.e. when pale objects will be difficult to see). While it is not possible to recommend a colour scheme that will ensure that bird strikes will never occur, an arrangement of both black and white segments or lines seems to provide a solution that allows for the maximum visibility of the tendons in a variety of light conditions. Furthermore, plastic markers similar to those that are currently used on (much thinner) overhead power cables should be mounted on the bridge tendons to make them even more visible to birds in flight.

The alternatives to such measures would be to light the tendons at night (which could cause potential problems, see below), or not to try to mitigate the collision risk posed by the tendons at all. While it is unlikely that there will be many collisions with the bridge tendons and any mortalities will not pose a threat to local bird populations, it would be advisable to attempt to mitigate against collisions both from the point of view of the potential traffic hazard that could be caused by injured birds on the roadway and the public upset that could follow a number of highly visible bird deaths or injuries (especially to Mute Swans, which are popular with the public and are particularly associated with the Claddagh area of Galway city).

An experiment with Ptarmigan in Norway (Bevanger and Brøseth, 2001) showed that the number of collisions with power lines is positively correlated with the number of overhead wire levels (vertical strands). The arrangement and number of bridge tendons should be such as to use the minimum number of cable levels (i.e. by using the minimum number of cables and by arranging these at the same levels, e.g. by pairing or grouping).

In addition to bird strike incidents caused by the failure of birds to see structures whilst in flight (‘blind strikes’), incidents are also caused by reflections on glass and by birds being attracted to lighted structures at night. While waders and geese do fly at night when moving over large distances, the phenomenon of bird strike following attraction to artificial lighting at night is best known for migrating passerines. The American Ornithologists Union (AOU) estimates that two to four million birds may be killed in collisions with communication towers annually in eastern North America. Night migrants are attracted to lights and circle the towers, often striking the guy wires that support them. This phenomenon has also been observed for many years at lighthouses, where birds eventually die after striking the light itself.

It is likely that the Irish Aviation Authority will require some lighting for safety reasons. Clearly, the legal requirements of the Authority must be satisfied, but (if possible) the lighting should be as low-intensity as is possible. Red lights have been shown to be the most likely to attract birds (Gauthreaux and Belser, 1999) and it is considered that steady rather than flashing lights are also dangerous to birds. Therefore, low-power flashing white lights would be the safest illumination type for the bridge pylons.

There have been suggestions that bridge tendons should be illuminated at night to make them visible to night-flying birds. However, this contradicts the logic of attempting to avoid attracting

passerine migrants into areas where they might collide with the tendons. In conclusion, it does not seem advisable to light the bridge tendons, provided that other methods are used to make them as visible as possible.

Whilst it is likely to be very difficult to detect (e.g. by corpse searching) incidences of bird strike by passerines (i.e. given their generally small size and the possibility of corpses either being scavenged or lost in the river), strikes by large birds like Mute Swans would have a relatively good chance of detection by people passing through the area. The authorities responsible for the maintenance of the bridge during the operational phase should be receptive to proposals to modify the colour scheme or lighting regime of the bridge in response to bird strike issues as they occur. Post construction studies should be conducted in order to try to observe any alteration of bird flight behaviour in response to proximity to cables or other parts of the bridge.

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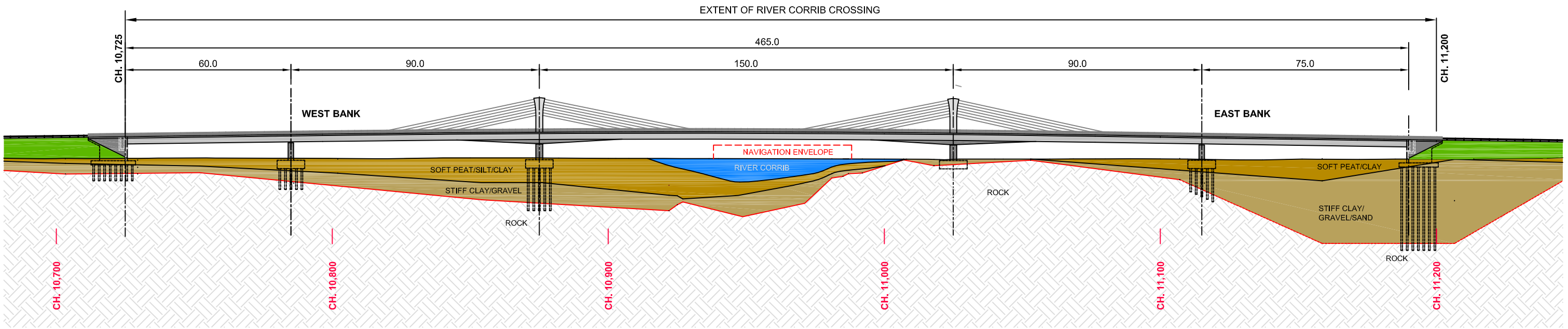
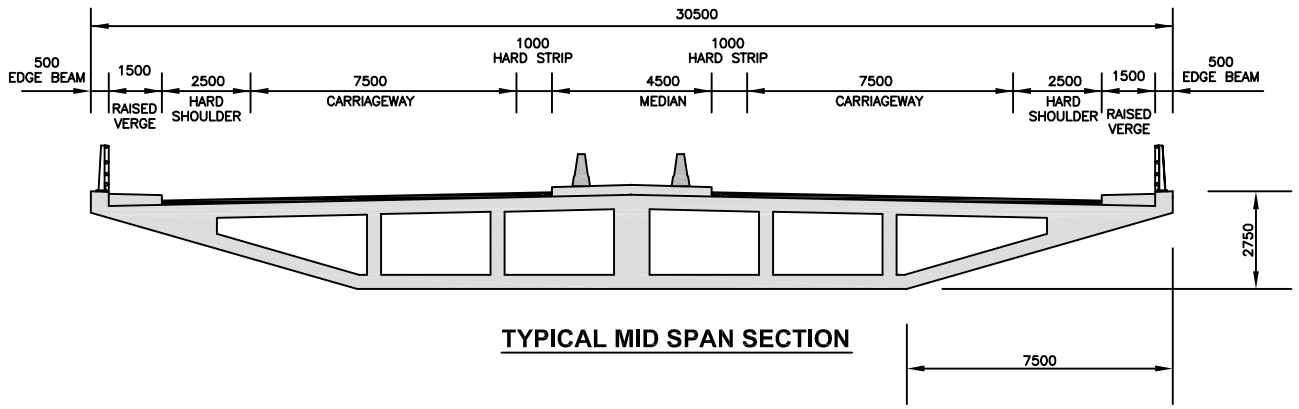
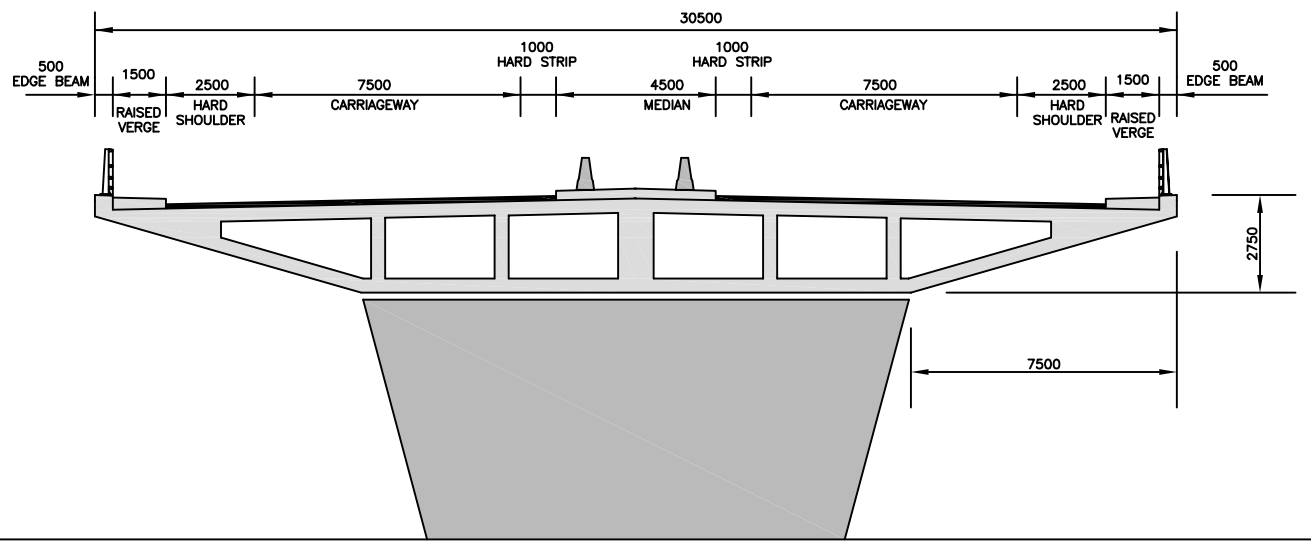
Appendix 1
Drawing of the design of the proposed bridge

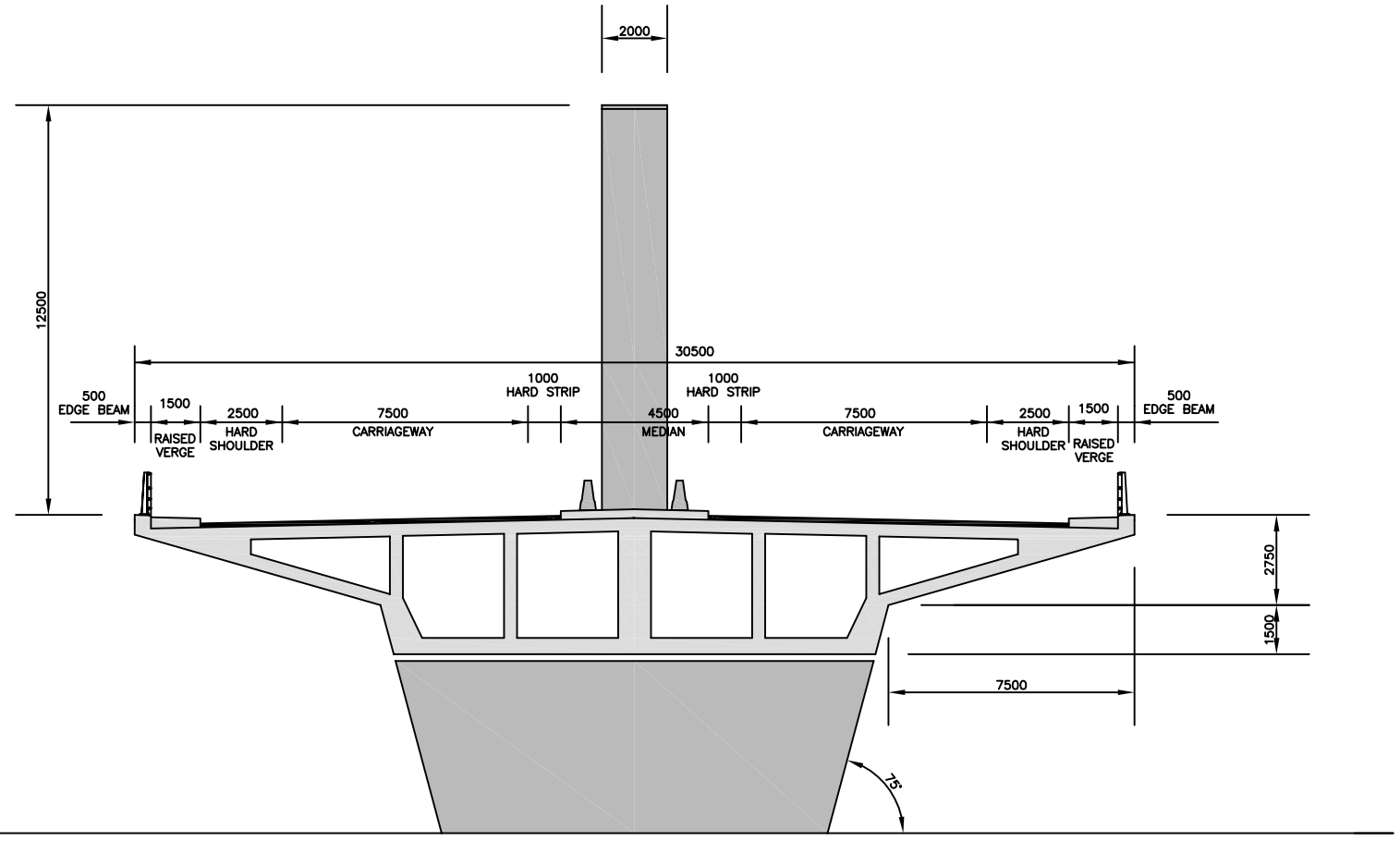




TYPICAL MID SPAN SECTION



APPROACH SPAN PIER SECTION



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Revisions

Rev	By	Date	Description

Project:	N6 GALWAY CITY OUTER BYPASS
Component:	STRUCTURES CONSULTATION DOCUMENT NUMBER 7 RIVER CORRIB CROSSING
Title:	EXTRADOSED BRIDGE - 150m SPAN
Designed: IGF	File Name:
Drawn: IGF	Original Scale: N.T.S.
Checked: DPH	Date: MARCH 2006

Drawing No: 1553/SCD7/004

Appendix 2

Raw data for birds flying through crossing area during watches

DAY Friday
DATE 5th August
WEEK No. 1
START 07:00
FINISH 09:00
WIND W shifting to NW but v. light.
TEMP 13-15 Cel.
CLOUD 20-50%
RAIN None
OTHER
SUNRISE 05:59
SUNSET 21:25
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
7:01	CA	-	1	S	15	M
7:02	WP	-	1	NW	5	M
7:03	CA	-	1	S	15	M
7:04	CA	-	3	S	20	E
7:05	MA	-	1	SW	1	M
7:07	GO	-	7	E	6	L
7:07	SL	-	4	circling	0.3-1.5	M
7:12	CA	-	2	NW	6	E
7:14	MA	-	1	WSW	6	L
7:19	CA	-	1	N	5	M
7:19	CA	-	1	N	6	E
7:20	CA	-	1	S	1	M
7:21	GB	Ad.	1	N	6	M
7:23	SL	-	2	WSW	3	L
7:28	HG	Ad. + Juv.	2	N	30	M
7:30	CA	Ad.	1	NNW	5	M
7:36	CA	-	1	N	5	M
7:45	GO	-	1	SW	7.5	M
7:47	SL	-	2	E	5	L
7:47	SM	-	2	NE	6	M
7:50	SL	-	4	N	6	W
7:52	HC	-	1	NW	6	M
7:58	GO	-	1	ENE	7-8	L
7:59	CA	-	1	S	25	M
7:59	GO	-	1	WSW	8	L
8:07	GB	Ad.	4	N	6	M
8:11	CA	Ad.	1	SSE	12	M
8:15	GB	Ad.	1	circling	11	M
8:15	RO	-	2	NW	6	M
8:17	SL	-	3	ENE	6	L
8:17	BH	Ad.	1	S	12	M
8:18	WP	-	1	WSW	6	L
8:20	RO	-	1	W	5	L
8:20	MH	Juv.	1	E	1	L
8:20	BH	Ad.	1	S	10	M
8:29	GO	-	1	W	6	L
8:33	SL	-	3	circling	10	M
8:33	SI	-	1	W	10	L
8:35	MA	Ad. ?	1	N	2	M

8:58	JD	-	6	W	8	L
9:00	CA	-	1	N	8	E

Menlo Pier (at end of watch): 3MH; 4CO; 3MS; 1H.; 35MA.

DAY	Friday
DATE	12th August
WEEK No.	2
START	19:11
FINISH	21:11
WIND	Steady breeze from slightly south of due West.
TEMP	15 Cel.
CLOUD	90%
RAIN	None
OTHER	
SUNRISE	06:10
SUNSET	21:11
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
19:11	WP	-	1	S	10	M
19:15	SL	-	3	circling	0.3-2	W
19:41	HG	Ad.	1	S	8-10	M
19:48	SL	-	10	N	0.3-5	M
19:52	CO	-	1	S	10	M
19:59	CM	Ad.	1	N	8-10	E
20:01	SL	-	1	N	0.1	M
20:02	SL	-	2	N	5-6	M
20:02	HM	-	1	N	5-6	M
20:08	SG	-	2000	N	5-6	E
20:12	SL	-	7	N	5-6	M
20:20	HM	-	5	W	5	L
20:20	SL	-	3	passing/repassing	0.1-1	M
20:23	SL	-	1	S	10	M
20:28	GB	-	2	N	8	M
20:28	SL	-	6	passing/repassing	0.1-4	M
20:31	GB	-	1	N	10	M
20:33	GB	-	2	S	5-8	M
20:45	HM	-	35	N	15	M
21:03	SL	-	20	N	10-15	E

Menlo Pier (before watch): 4MH; 5CO; 27MA.

DAY	Friday
DATE	19th August
WEEK No.	3
START	10:25
FINISH	12:25
WIND	Westerly fresh breeze, gusty at end of watch.
TEMP	16-18 Cel.
CLOUD	30-50% at start 80-90% at end.
RAIN	None
OTHER	Sunny intervals.
SUNRISE	06:22
SUNSET	20:56
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
10:38	MA	-	1	N	3	M
10:38	RO	-	2	NW	5-10	M
10:51	CA	-	1	N	10	M
10:51	SL	-	1	N	15	M
11:03	JD	-	1	W	10	L
11:05	CA	-	1	passing N, repassing S	15; 20-25	M
11:10	RO	-	2	E	10	L
11:12	JD	-	2	N	5-6	W
11:20	CA	-	1	N	7-8	M
11:28	SM	-	2	N	10-15	M
11:32	CA	-	1	S	10-15	M
11:39	WP	-	1	N	5	M
11:40	WP	-	4	E	5-10	L
11:42	JD	-	3	E	5-15	L
12:08	JD	-	4	SE	8	M
12:13	CA	-	4	S	10-20	E
12:24	JD	-	34	E	10	L

Menlo Pier (before watch): 4CO; 27MA.

DAY	Friday
DATE	26th August
WEEK No.	4
START	15:15
FINISH	17:15
WIND	Fresh southwesterly breeze, veering to westerly by end of watch.
TEMP	15 Cel.
CLOUD	80% at start, 50% at end.
RAIN	None
OTHER	
SUNRISE	06:34
SUNSET	20:41
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
15:53	GB	Ad.	1	passing S, repassing N	20	E
16:02	BH	Ad. Win.	1	SW	25-30	L
16:05	SM	-	3	circling	20	W
16:16	RO	-	1	S	30	W
16:19	SL	-	1	circling	1	M
16:30	SL	-	2	circling	1-2	M
16:37	RO	-	2	W	10-15	L
16:38	HG	Juv.	1	SE	15-25	M
16:43	JD	-	1	SE	15	M
16:49	GL	-	2	S	10-15	W
16:53	SL	-	3	circled, then S	1	M
16:53	HM	-	1	S	5	M
16:57	SL	-	2	circled, then W	1	M
17:02	SL	-	5	circling	1	M
17:02	HM	-	1	circling	1	M
17:02	SM	-	1	circling	1	M

Menlo Pier (after watch): 5MH; 6CO; 31MA.

DAY	Friday
DATE	2nd September
WEEK No.	5
START	09:00
FINISH	11:00
WIND	Light southerly breeze.
TEMP	14-15 Cel.
CLOUD	Less than 5%
RAIN	None
OTHER	
SUNRISE	06:47
SUNSET	20:24
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
09:07	SL	-	2	cirlced, then N	Less than 5	M
09:19	JD	-	2	E	15	L
09:55	RO	-	2	N	20	W
10:00	MA	-	1	S	5	E
10:00	MA	?	1	S	2-3	W
10:01	MA	-	1	S	4-5	M
10:08	MA	-	1	S	5	M
10:15	GO	-	1	SE	Less than 4	M
10:19	SH	?	1	W	15-20	L
10:25	MA	-	1	S	5	M
10:27	WP	-	1	S	8-10	E
10:35	SL	-	2	circling, then W	30-40	W
10:52	BH	Ad. Win.	1	N	5	M
10:54	MS	Ad.	2	S	20	E
10:55	HM	-	2	circled, then S	15-30	E
10:57	WP	-	1	W	10-15	L

Menlo Pier (after watch): 4MH; 5CO; 24MA.

DAY	Friday
DATE	9th September
WEEK No.	6
START	07:00
FINISH	09:00
WIND	V. light NW
TEMP	13-14.8 Cel.
CLOUD	95+%
RAIN	light, but continuous
OTHER	
SUNRISE	06:59
SUNSET	20.08
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
07:05	SL	-	1	E	15	L
07:19	HG	Ad.	2	N	15-20	M
07:23	BG	Ad. & 1st Win.	2	N	10	M
07:29	CA	-	2	S	20-25	M
07:40	BH	-	32	N	5-15	M
07:40	CM	Ad. & Imm.	2	N	5-15	M
07:45	MA	-	3	N, veering to W at crossing point	10, rising to 20	M
07:47	BH	-	2	S	20	M
07:50	MA	-	2	N	5-10	M
08:01	BH	-	3	N	15-20	M
08:05	LB	Imm.	2	N	15-20	M
08:06	SL	-	2	E	10-15	L
08:06	GB	Ad.	1	N	20	M
08:08	LB	Imm.	1	N	5-10	M
08:08	BH	Ad.	3	N	5-10	M
08:11	WP	-	3	E	15	L
08:13	WP	-	3	NE	15	M
08:15	BH	Ad.	2	N	20-25	M
08:15	WP	-	1	SE	15-20	M
08:25	MA	-	2	S	15	M
08:27	CA	-	1	N	20-25	W
08:28	HG	Juv.	2	N	10-15	M
08:33	WP	-	2	E	15	L
08:40	CM	Ad.	1	N	10-15	M
08:45	WP	-	1	N	5-10	M
08:50	CA	-	1	N	20-25	M
08:51	CM	Ad.	1	S	20	M
08:52	HG	Juv.	2	N	15-20	M
08:55	WP	-	1	E	10	L
09:00	WP	-	3	E	15	L

Menlo Pier (before watch): 2MH; 3CO; 13MA, WA, LB.

DAY	Friday
DATE	16th September
WEEK No.	7
START	14:15
FINISH	16:15
WIND	Light northerly at start, freshening later.
TEMP	16-20 Cel.
CLOUD	80-90%
RAIN	None
OTHER	Overcast
SUNRISE	07:11
SUNSET	19:51
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
14:22	BH	Ad. Win. & 1st Win	2	N	10	M
14:25	BH	Ad. Win.	1	S	7-8	M
14:29	BF	-	2	N	20	E
14:32	CM	Ad.	1	N	10	M
14:32	WP	-	1	E	15	L
14:35	BH	Ad. Win.	1	N	5	M
14:40	BH	Ad. Win.	1	S	15	M
14:43	MA	-	1	N	3	W
14:50	GO	-	8	E	15	L
15:00	SL	-	2	E	5	L
15:01	SL	-	3	E	15	L
15:05	SL	-	3	N	1-5	M
15:09	RO	-	7	NE through crossing then back across river to W	5	M
15:15	JD	-	1	NW	20	M
15:35	RO	-	1	W	5	L
15:36	BH	Ad. Win.	1	N	5	M
15:37	BH	1st Win.	1	N	2	M
15:42	JD	-	15	S	5-10	W
15:44	BH	Ad. Win.	1	N	5	M
15:45	HG	Juv.	2	N	15	M
15:52	WP	-	1	SE	15	M
16:10	BH	1st Win.	1	S	5	M
16:13	BH	1st Win.	1	N	5	M

Menlo Pier (after watch): 3MH; 3CO; 30MA.

DAY	Friday
DATE	23rd September
WEEK No.	8
START	16:30
FINISH	18:30
WIND	Fresh northerly breeze
TEMP	20.5-24 Cel.
CLOUD	20-30%
RAIN	None
OTHER	Clear
SUNRISE	07:23
SUNSET	19:34
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
16:44	CM	1st Win.	1	N	2-3	E
16:45	CM	Ad. Win.	1	N	2-3	E
16:48	BH	-	12	circled, then headed S	30	M
16:51	BH	Ad. Win.	1	N	3	M
16:54	CM	Ad. Win.	1	S	5	M
17:02	CM	Ad. Win.	1	N	5	E
17:02	CN	Ad.	1	S	3-4	M
17:05	CN	Ad.	1	N, fishing	3	M
17:06	CN	Ad.	1	N	5	M
17:07	CM	Ad. Win.	1	N	5	M
17:07	RO	-	1	NE	10	M
17:19	BH	Ad. Win.	3	N	10	M
17:20	SL	-	1	E	5	L
17:30	BH	-	3	N	10	M
17:35	MA	? & ?	2	S	2	W
17:44	BH	Ad. Win.	1	N	5	M
17:53	RO	-	1	W	10	L
17:53	BH	-	1	S	10	M
17:54	CD	-	2	SW	25	M
17:55	CN	Ad.	1	S	0.3	M
17:55	CN	Ad.	1	S	3-4	M
18:02	H.	-	1	S	30	M
18:02	GB	Ad.	1	S	35	M
18:06	BH	-	1	S	10	M
18:06	BH	-	1	N	5	M
18:10	PW	-	1	S	3	E
18:13	WP	-	1	NW	15	M
18:13	BH	-	1	S	5	M
18:13	BH	-	1	S	20	M
18:14	K.	?	1	W	15, down to 2	L
18:15	SL	-	1	SE	15	M

Menlo Pier (after watch): 4MH; 2CO; 31MA; 2BH

DAY	Friday
DATE	30th September
WEEK No.	9
START	15:00
FINISH	17:00
WIND	Strong, blustery, westerly breeze. Freshening and turning to northwest later.
TEMP	16-17.2 Cel.
CLOUD	30-50%
RAIN	None
OTHER	
SUNRISE	07:35
SUNSET	19:17
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
15:05	MA	?	1	S	2-3	M
15:09	WP		1	W	15-20	L
15:11	JD		2	W	5	L
15:13	SL		1	S	2-3	M
15:25	BH	1st Win.	1	N	2	M
15:27	SL		2	circled, then W	> 1	M
15:37	WP		1	W, then turned N	15	M
15:37	BH	1st Win.	1	S	15	E
15:50	RO		2	W	15	L
15:55	BH	Ad. Win.	1	N	4-5	E
15:56	BH		10	S	15	M
15:56	CM		1	S	15	M
16:05	H.		1	W, landed at western crossing point	15 down to 0	L
16:07	WP		1	SE	20	M
16:08	CA		1	S	30	E
16:24	RO		1	W	15	L
16:25	BH		8	S	20	M
16:25	CM		1	S	20	M
16:26	BH		3	S	15	E
16:30	BH	Ad. Win.	1	N	15	W
16:53	BH		7	S	35	E
16:56	BH		1	N	5	E

Menlo Pier (after watch): 1 H.; 2CO; 11MA; 8BH

DAY	Friday
DATE	7th October
WEEK No.	10
START	08:00
FINISH	10:00
WIND	Light southerly, freshening later.
TEMP	11.9-13.5 Cel.
CLOUD	10-20%
RAIN	None
OTHER	Clear, sunny.
SUNRISE	07:47
SUNSET	19:00
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
08:05	MG		1	W	20	L
08:07	JD		2	W	15	L
08:15	MS		2	N	15	M
08:23	RO		1	E	10	L
08:30	MP		2	SE	5	M
08:31	MP		3	SE	10	M
08:33	MP		1	SE	5	M
08:35	BH	Ad. Win.	1	N	10	M
08:35	OC		1	E	10	L
08:37	H.		1	N	2-3	W
08:38	HG	Juv.	1	S	15	E
08:40	MS	Ad.	2	SE, turned S at crossing.	7-8	M
08:41	BH	Ad. Win.	1	S	7-8	M
08:44	WP		1	E	10	L
08:45	WP		2	SE	15	M
08:56	BH	Ad. Win.	1	S	10	W
08:57	MA	?	1	S	8-10	M
08:59	WP		2	W	10	L
08:59	WP		1	E	15	L
09:00	WP		1	E	10	L
09:02	SN		1	S, veered away to SE just after crossing.	25	M
09:03	GB	Ad.	1	N	10-15	E
09:10	MP		1	E	20	L
09:10	SH		1	E	8-10	L
09:10	MP		6	E, mobbing SH	8-10	L
09:15	RO		2	E, veered N at eastern crossing point.	10	L
09:17	RO		1	NE	7-8	M
09:19	WP		3	E	10	L
09:25	BH	Ad. Win.	1	S	5	W
09:25	GT		2	W	15	L
09:30	BH	Ad. Win.	1	S	2	W
09:35	BH	Ad. Win.	1	S	5	M
09:35	RO		1	S	5	M
09:35	MS	Ad.	2	S	10	M
09:40	WP		1	E and retraced route W	8	L
09:45	BH	Ad. Win.	1	S	2-3	M
09:47	RO		1	S	5	M
09:47	SG		8	W	5	L
09:48	BH	Ad. Win.	1	N	5	M

09:51	BH	Ad. Win.	1	S and retraced route N	3	M
09:51	BH	Ad. Win.	1	N	5	M
09:52	WP		1	S and veering SE after crossing.	5 rising to 15	M

Menlo Pier (before watch): 3LG; 1 H.; 1CO; 29MA; 3BH

DAY	Saturday
DATE	15th October
WEEK No.	11
START	13:00
FINISH	15:00
WIND	Southeast breeze, freshening later.
TEMP	19.8-21 Cel.
CLOUD	50-65%
RAIN	None
OTHER	Sunny, misty at start.
SUNRISE	08:02
SUNSET	18:41
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
13:02	CA		1	S	3-5	E
13:10	CA		1	S	5	W
13:15	WP		1	NE	10	M
13:20	JD		2	NE	5	M
13:24	BH	Ad. Win.	1	N	15	W
13:26	MG		1	E	5	L
13:30	BH		7	Came from E, circled crossing, went back E.	15	M
13:30	WP		1	S	15	E
13:33	BH	Ad. Win.	1	SW	20	M
13:34	BF	?	1	E	10	L
13:36	CA		1	S	3	M
13:41	RO		2	E	10	L
13:52	CA		1	S	5	E
13:53	CA		1	S	2-3	W
14:01	RO		2	E	10	L
14:04	BH	Ad. Win.	1	S	20	M
14:12	L.		6	S	15	W
14:13	BH	Ad. Win.	1	S	10	M
14:25	H.		1	NW through crossing, turned to N.	5	M
14:26	WP		1	W	15-20	L
14:31	WP		1	E	15	L
14:37	JD		7	E	5-15	L
14:37	RO		2	E	5-15	L
14:37	SG		5	E	5-15	L
14:38	BF		3	W	20	L
14:38	CA		1	S	15	M
14:41	CA		1	N	20-25	M
14:43	WP		2	NE	5-10	M
14:54	GO		1	W	20	L

Menlo Pier (after watch): 3MH; 2CO; 16MA (11?); 1BH

DAY	Friday
DATE	21st October
WEEK No.	12
START	14:45
FINISH	16:45
WIND	Light northerly
TEMP	13.4-13.7 Cel.
CLOUD	100%
RAIN	None
OTHER	
SUNRISE	08:13
SUNSET	18:28
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
15:06	MA		2	S	5	M
15:11	BH	Ad. Win.	1	S	15	M
15:13	WP		1	W	10	L
15:13	WP		1	W	15	L
15:20	BH	Ad. Win.	1	S	20	M
15:31	RO		1	E	20	L
15:39	MS	Ad.	3	S	15	E
15:42	MS	Ad.	1	N	3	M
15:48	MS	Ad. ?	1	N, landed in river at crossing.	1	M
15:50	MS	Ad. ?	1	N, landed in river at crossing.	1	M
16:00	MA	?	1	N	1	M
16:03	BH	Ad. Win.	1	N	20	E
16:04	BH	Ad. Win.	1	S	25	M
16:05	WP		1	W	10	L
16:07	BH	Ad. Win.	1	N	10	M
16:12	BH	Ad. Win.	1	N	10	M
16:13	BH		5	S	20	M
16:19	RO		1	E	10	L
16:19	RO		1	NE	15	M
16:23	WP		1	W	10	L
16:23	MA		2	N	3	M
16:23	BH	Ad. Win.	2	N	15-20	M
16:23	CA		1	N	5	M
16:39	BH	Ad. Win.	2	S	5	M
16:44	WP		2	S	25	M

Menlo Pier (before watch): 12MH; 2CO; 20MA (13?)

DAY	Saturday
DATE	29th October
WEEK No.	13
START	16:10
FINISH	18:10
WIND	Strong southerly.
TEMP	14.7-17.1 Cel.
CLOUD	70-80%
RAIN	None, except light spitting in last 10 minutes.
OTHER	
SUNRISE	08:28
SUNSET	18:11
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
16:32	BH	Ad. Win.	1	N	8-10	E
16:33	BH	1st Win.	1	From E, circled crossing, back E.	15	M
16:35	RE	-	4	E	15	L
16:47	WP	-	2	E	10	L
16:51	H.	-	1	NW	1-2	M
16:59	WP	-	1	S	15	M
17:00	WP	-	2	NW	10	M
17:05	MA	?	4	S	3-5	M
17:08	BH	Ad. Win.	1	S	15	E
17:13	WP	-	2	W	10	L
17:32	WP	-	1	W	10	L
17:49	CM	-	3	S	15-20	M
17:53	H.	-	1	S	0.5	M
17:54	CA	-	1	N	15-20	M
18:03	MA	?	1	S	0.5	M
18:08	MA	-	8	W	15	L
18:09	MA	-	5	S	15	E

Menlo Pier (before watch): 2MH; 3CO; 12MA (7?): BH (Ad. Win.)

DAY	Friday
DATE	4th November
WEEK No.	14
START	15:00
FINISH	17:00
WIND	Light westerly.
TEMP	9.1-12.7 Cel.
CLOUD	10-30%
RAIN	None.
OTHER	Mainly bright and clear.
SUNRISE	07:39
SUNSET	16:59
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
15:04	MA	?	1	W	1-2 m, landed on river in front of VP.	L
15:09	BH	Ad. Win.	1	N	5	E
15:12	MP	-	1	SW	15	M
15:12	BH	Ad. Win.	1	W	10	L
15:13	RO	-	1	N	3-5	W
15:18	WP	-	1	E	10	L
15:19	RO	-	1	SW	10	M
15:25	BH	Ad. Win.	2	S	10	M
15:33	RO	-	1	N	10	M
15:38	WP	-	1	NE	10	M
15:41	M.	-	1	S	10	E
15:42	H.	-	2	N	10	M
15:44	H.	-	1	S, behind VP.	15	E
15:45	BH	-	4	N	5-10	M
15:46	BH	-	5	Circled crossing, then N	3-10	M
16:04	BH	-	2	S	15	M
16:06	WP	-	1	N	15	M
16:19	BH	Ad. Win.	2	S	5	M
16:22	BH	Ad. Win.	1	S	10	M
16:28	RO	-	2	N	10-15	M
16:28	BH	Ad. Win.	1	N	15	M
16:36	MA	-	2	S	5	M
16:36	MA	-	3	S	10	M
16:38	BH	Ad. Win.	1	S	5-7	M
16:39	BH	Ad. Win.	1	S	10	M
16:40	MA	2 ?	3	N	4	M
16:44	BH	-	4	S	5	M
16:44	MA	1 ?	2	N	2	M
16:45	BH	-	2	S	15	M
16:46	RO	-	1	S	15	M
16:47	MA	-	2	S	8	M
16:49	BH	Ad. Win.	1	S	10	M
16:52	RO	-	2	N	20	M
16:53	GL	-	1	N	2	M
16:54	RO	-	37	N	5-15	W
16:56	MA	-	2	S	2-4	M
16:56	GL	-	1	S	3	M
16:57	BH	-	1	S	15	M

Menlo Pier (before watch): 3CO; 3 MS; 18MA (10?); 21 BH.

DAY Friday
DATE 11th November
WEEK No. 15
START 07:55
FINISH 09:55
WIND Strong southwesterly gale.
TEMP 11 Celsius
CLOUD 80-100%
RAIN Spitting in wind, not much.
OTHER
SUNRISE 07:53
SUNSET 16:47
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
08:10	MA		2	S	5	M
08:12	BH	Ad. Win.	1	S	5	M
08:25	BH		30	N	10-20	M
08:36	BH	Ad. Win.	1	S	10	M
08:52	BH	Ad. Win.	1	S	15	M
08:53	BH	1st Win.	1	W	20	L
08:58	WP		1	S	2-3	M
09:00	SG		5	W	1-2	L
09:00	K.		1	E	3-15	L
09:03	BH		11	NW	10-20	M
09:07	BH		14	S	10-25	M
09:09	CM	Ad.	1	S	5	E
09:09	BH	Ad. Win.	1	N	8-10	M
09:10	SG		5	E	10	L
09:12	CA		1	S	3-4	M
09:12	MA	1 ?	2	S	1-3	M
09:13	BH	Ad. Win.	1	S	15-20	M
09:18	BH		2	S	20	W
09:19	WP		1	N	10	M
09:20	RO		1	E	15	L
09:20	CM	Ad.	3	S	3-15	E
09:21	RO		2	W	1-2	L
09:21	CM		1	S	15	M
09:21	BH		2	S	15	M
09:22	BH	Ad. Win.	1	S	15	M
09:24	BH	Ad. Win.	1	S	0.5-3	M
09:26	MA		2	N	15-3	M
09:34	BH		1	S	15	M
09:45	WP		1	W	10	L
09:48	RO		2	N	10-15	W
09:48	BH		1	S	25-30	W
09:52	CM		1	S	5-10	M

Menlo Pier (after watch): 18MA (11?); 2CO; 1BH; 3MS (2Ad. & Juv.).

DAY Friday
DATE 18th November
WEEK No. 16
START 10:30
FINISH 12:30
WIND Light southwesterly breeze
TEMP 12.3-13.8 Celsius.
CLOUD 30-50%
RAIN None
OTHER Clear, sunny intervals.
SUNRISE 08:05
SUNSET 16:36
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
10:43	JD		1	W	5	L
10:48	CM	Ad.	1	S	1-3, landing several times on river.	M
10:52	JD		2	NW	10	M
11:06	RO		2	W	5-8	L
11:12	RO		1	W	10	L
11:12	WP		1	SE	10-15	M
11:15	MG		1	SE	5-10	M
11:18	BH	Ad. Win.	1	S	15	W
11:19	BH	Ad. Win.	2	S	5	W
11:22	SN		3	S	20	E
11:23	BH	Ad. Win.	2	S	15	M
11:24	CM	Ad. & 2 Imm.	3	S	10	M
11:37	JD		3	W	10	L
11:41	BH	Ad. Win.	2	S	15	M
11:46	CM	Ad.	1	N	10	M
11:46	JD		1	E	10	L
11:46	BH	Ad. Win.	1	N	15	M
11:53	JD		1	E	10	L
11:53	BH	Ad. Win.	1	S	10	E
12:09	RO		1	E	10	L
12:10	BH	Ad. Win.	1	S	20	W
12:10	MP		1	S	20	W
12:15	RO		2	E	10	L
12:17	CM	Ad.	1	S	10	W
12:18	MS	Ad.	1	S	3-4	M
12:20	MS	Ad.	1	S	3-4	M
12:23	CA		1	S	5	M
12:24	L.		7	S	10-15	W
12:25	BH	Ad. Win.	1	N	5	M

Menlo Pier (after watch): 14MA (9?); 3MS (2Ad. & Juv.); 16BH; 1CO.

DAY Friday
DATE 25th November
WEEK No. 17
START 10:00
FINISH 12:00
WIND Northerly, fresh breeze, strengthening towards end of watch.
TEMP 4.0-4.6 Celsius
CLOUD 10-80% (80% at start)
RAIN Showers, sleet & hail.
OTHER Sunny intervals
SUNRISE 08:18
SUNSET 16:28
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
10:10	RE		3	SW	10	M
10:20	RO		1	S	10	M
10:22	SH		1	E	0.6	L
10:26	DN		2	N	0.3-0.6	W
10:30	BH	Ad. Win.	1	S	5	M
10:38	BH	Ad. Win.	2	N	5	E
10:45	MA	?	1	N	3	E
10:45	HC		1	N	15	M
10:47	H.		1	S	2-3	M
10:50	BH	Ad. Win.	1	S	10	M
10:50	BH	Ad. Win.	1	N	5	M
10:52	BH	Ad. Win.	1	N	3	E
10:53	BH	Ad. Win.	1	N	2	M
11:02	BH	Ad. Win.	2	N	2	M
11:05	MG		1	N	1-2	W
11:06	ST		1	E	10	L
11:08	MS	Ad.	1	N	1	M
11:13	BH	Ad. Win.	1	N	3	M
11:14	JD		1	NE	20	M
11:19	JD		1	SE	15	M
11:31	BH	Ad. Win.	1	N	0.3	M
11:32	BH	Ad. Win.	1	N	1-2	M
11:38	MA	?	1	N	0.5-2	E
11:43	WP		1	S	15	M
11:45	BH	Ad. Win.	1	N	2-3	M
11:55	BH	Ad. Win.	1	S	5	M
11:59	CM	Ad.	1	N	3	M
12:00	BH	Ad. Win.	1	N	3-4	M

Menlo Pier (after watch): 8MA (6?); 16BH; 2 Ad. MS; 2 CO.

DAY Friday
DATE 2nd December
WEEK No. 18
START 08:30
FINISH 10:30
WIND Flat calm
TEMP 3.7-4.9 Celsius
CLOUD 5-10%
RAIN None
OTHER
SUNRISE 08:30
SUNSET 16:21
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
08:43	CA		1	N	5	M
08:51	BH	Ad. Win.	3	N	15	M
08:51	MA	1?	2	N	15	M
08:57	CA		1	N	10	M
08:58	CA		1	N	1	M
09:00	BH	Ad. Win.	1	N	10	M
09:00	GT		1	S	15	E
09:07	BH	Ad. Win.	2	N	5	M
09:13	CA		1	N	10	M
09:13	GF		1	W	25	L
09:13	BH	Ad. Win.	1	N	5	M
09:16	BH	Ad. Win.	2	N	5	M
09:18	H.		1	N, landed in reeds at crossing point on W bank.	0	W
09:18	BH	Ad. Win.	1	N	5	M
09:20	MA	1?	2	S	2	M
09:22	BH	Ad. Win.	3	N	5	M
09:23	BH	Ad. Win.	3	N	5	M
09:23	BH	Ad. Win.	1	S	3-4	M
09:25	MA	1?	2	S	5	M
09:25	CA		1	S	3-4	M
09:27	BH	Ad. Win.	1	N	5	M
09:28	CA		1	S	5	E
09:33	RO		1	W	10	L
09:36	BH	Ad. Win.	1	N	5	M
09:40	BH	Ad. Win.	1	S	5	E
09:45	CA		1	N	20	M
09:47	CA		1	N	5	M
09:50	BH	1st Win.	1	S, circled around crossing area, then back N.	3-4	W
09:50	CA		1	N	20	M
09:52	BH	Ad. Win.	1	N	5	M
09:55	RO		1	W	15	L
10:08	BH	Ad. Win.	1	N	10	M
10:11	BH	Ad. Win.	2	S	3-4	E
10:11	CA		2	S	5	E
10:12	BH	Ad. Win.	2	N	2-3	W
10:12	BH	Ad. Win.	1	N	3-4	E
10:15	BH	Ad. Win.	1	N	3-4	M
10:24	RO		1	E	15	L

Menlo Pier (after watch): MS; 2CO; 5BH; 7MA (4?).

DAY Saturday
DATE 10th December
WEEK No. 19
START 13:00
FINISH 15:00
WIND Light southeasterly breeze
TEMP 12.6-13.5 Celsius
CLOUD 30-40%
RAIN None
OTHER
SUNRISE 08:39
SUNSET 16:18
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
13:00	SH	?	1	W	5 down to 2	L
13:03	BH	Ad. Win.	1	S	3-5	W
13:09	SH	?	1	W	10 down to 5	W
13:15	BH	Ad. Win.	1	N	10	M
13:19	BH	Ad. Win.	1	N	15	E
13:23	MP		1	W	10	L
13:31	BH	Ad. Win.	1	S	15	M
13:32	RO		1	S	10	L
13:32	JD		1	E	8	L
13:40	CM	Ad.	1	N	15	W
13:41	CU		1	Flushed by runner from a point near to W bank crossing point, flew S.	10 up to 30	W
13:43	BH	1st Win.	1	S	10	M
13:49	BH	Ad. Win.	2	S	8	M
13:50	CM	Ad.	1	S	12	W
13:59	BH	Ad. Win.	3	S	10	E
14:02	JD		1	N	10	M
14:06	CM	Ad.	1	S	5	W
14:06	JD		1	S	3-4	W
14:09	CM	Ad.	2	Circled around W bank crossing point, then S.	5	W
14:10	BH	Ad. Win.	1	S	2-3	M
14:26	BH	Ad. Win.	1	S	3-4	W
14:31	BH	1st Win.	1	S	3-4	E
14:31	SG		1	E	15	L
14:46	CM	Ad.	1	S	10	M
14:46	BH	Ad. Win.	1	N	10	M
14:51	BH	Ad. Win.	1	N	10	E

Menlo Pier (after watch): 36MA (25?); 26BH; 3(2Ad.,1Juv) MS; 2 CO.

DAY Friday
DATE 16th December
WEEK No. 20
START 15:00
FINISH 17:00
WIND Northerly breeze.
TEMP 8.8-10 Celsius
CLOUD 80-90%
RAIN None
OTHER
SUNRISE 08:45
SUNSET 16:17
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
15:02	BH	Ad. Win.	1	N	20	E
15:02	RO		1	N	20	E
15:09	CM	Ad.	1	N	15	E
15:21	BH	Ad. Win.	1	S	15	M
15:31	CM	Ad.	1	S	5	M
15:41	MA	Pair	2	S along E bank, circled around over VP, then E.	5 up to 20	E
15:53	WP		1	W	15	L
15:56	MA	Pair	2	S	4-5	E
15:58	BH	Ad. Win.	2	S	8-10	M
15:59	BH	Ad. Win.	1	S	15	E
16:01	CA		1	S	10	E
16:01	BH	Ad. Win.	1	S	15	E
16:02	BH	Ad. Win.	1	S	5	M
16:04	CM	Ad.	1	S	15	M
16:04	BH	Ad. Win.	2	S	10	M
16:10	BH	Ad. Win.	2	S	5	M
16:12	BH	Ad. Win.	9	S	3-8	M
16:22	LG		1	NW, flying but with whole of body not leaving water, stopped in front of W bank at crossing point.	0	W
16:23	CA		1	S	15	M
16:37	RO		1	SE	10	M
16:51	ML		1	E	15	L

Menlo Pier (before watch): 21MA (11?); 21BH; 3MS (2Ad.,1Juv); 2 CO.

DAY Friday
DATE 23rd December
WEEK No. 21
START 13:00
FINISH 15:00
WIND Light southwesterly breeze.
TEMP 11.5-11.8 Celsius
CLOUD 85-100%
RAIN None
OTHER Dull & grey, but mild.
SUNRISE 08:49
SUNSET 16:20
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
13:00	GO		1	S		E
13:01	BH	Ad. Win.	1	N		M
13:03	BH		6	S	5-10	M
13:04	BH		1	S		M
13:06	WP		1	W		L
13:06	CA		1	S	3-5	M
13:09	WP		1	SE		M
13:20	GL		1	E	15	L
13:22	GB	Ad.	1	S	10	E
13:25	BH	Ad. Win.	1	S	10	M
13:34	CA		1	NW	15	M
13:40	LU	1st Win.	1	S	10	M
13:48	RO		1	NE	10	M
13:54	BH	Ad. Win.	1	S	8	W
13:55	BH	Ad. Win.	2	S	5-7	W
13:58	MA	?	1	S	1-2	M
14:20	BH	Ad. Win.	1	N	10	E
14:21	BH	Ad. Win.	1	S	10	E
14:24	GR		2	E	10	L
14:29	CD		2	SW	8	M
14:36	GO		1	E	15	L
14:39	BH	1st Win.	1	S	12	E
14:42	MA	Pair	2	N	3 down to 1	E
14:45	BH	Ad. Win.	2	S	10	M
14:52	WP		2	N	10	W
14:53	BH	Ad. Win.	2	S	8	M
14:57	GR		1	W	15	L
15:00	GO		2	W	5	L

Menlo Pier (after watch): 33MA (21?); 9BH; 3(2Ad.,1Juv) MS; 2 CO; GL; PW.

DAY Friday
DATE 30th December
WEEK No. 22
START 11:00
FINISH 13:00
WIND Westerly breeze.
TEMP 8-10 Celsius
CLOUD 10-80% (80% at start)
RAIN None
OTHER
SUNRISE 08:51
SUNSET 16:25
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
11:10	CM	Ad.	1	N	10	M
11:20	MA	?	1	N along E bank, turned back & S along W bank.	1-2	W
11:41	HH	?	1	S along W bank, turned back & N along W bank.	3-8	W
11:46	BH	Ad. Win.	1	Circled crossing site, then N.	20	E
12:09	HC		5	Moving about in area behind W bank crossing point.	1-3	W
12:15	MA		2	S landed in river in line of crossing.	1	M
12:30	BH	Ad. Win.	1	S	3-5	M
12:32	MA		1	S	1	W
12:38	CM	Ad.	3	S	10-15	E
12:40	BH	Ad. Win.	2	S	10	M
12:41	MA	Pair	2	N	0.5	M
12:42	WP		1	W	5	L
12:52	MA	?	1	S	0.5	M
12:53	BH	Ad. Win.	1	N	15	E
12:58	BH	Ad. Win.	1	W, turned S half way across river.	10-15	L

Menlo Pier (after watch): 13MA; 23BH; 3CM; 3MS (2Ad.,1Juv.); CO; MH.

DAY Friday
DATE 6th January
WEEK No. 23
START 09:00
FINISH 11:00
WIND Flat calm
TEMP 5.2-6.1 Celsius
CLOUD 100% diffuse cloud cover
RAIN Very light drizzle at start
OTHER Very dull and misty at the start
SUNRISE 08:49
SUNSET 16:33
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
09:00	MA		2	N	5	M
09:11	LR		1	W	20	L
09:12	BH	Ad. Win.	2	N	5	M
09:13	BH	Ad. Win.	5	N	5-8	M
09:19	BH	Ad. Win.	2	N	5	M
09:22	BH	Ad. Win.	2	S	3-4	W
09:22	GR	Ad. Win.	1	W	15	L
09:24	CM	Ad.	1	N	4	E
09:26	BH	Ad. Win.	1	N	5	M
09:30	CD		1	SW	3-4	M
09:40	BH	Ad. Win.	1	S	4	M
09:54	BH	Ad. Win.	3	N	3-4	M
09:54	BH	Ad. Win.	1	N	10-12	M
09:55	CA		1	N	15	E
10:09	CA		1	N	10	M
10:09	BH	Ad. Win.	1	N	3-4	M
10:22	BH	2-Ad. Win, 2-1st Win.	4	N	5-8	M
10:23	BH	Ad. Win.	2	N	5	M
10:24	BH	Ad. Win.	2	N	3-4	M
10:27	BH	Ad. Win.	2	N	4-5	M
10:29	MA	Pair	2	S	5	M
10:30	CA		2	E	15	L
10:30	BH	Ad. Win.	1	N	5	E
10:31	BH	Ad. Win.	1	S	5	M
10:32	BH		12	N	3-8	M
10:32	MS	Ad.	2	N	5	M
10:32	BH	Ad. Win.	1	S	4	M
10:35	MA		5	S	15	M
10:41	CM	Ad.	2	N	3-4	M
10:43	BH	Ad. Win.	1	N	4	M
10:44	L.		21	S	15	M
10:46	BH	Ad. Win.	1	S	10	M
10:55	BH	Ad. Win.	1	N	5	M
10:58	BH	Ad. Win & 1st Win.	2	S	4-5	M

Menlo Pier (before watch): 2CO; 7MA(4?); Ad. Win. BH; Ad. MS.

DAY Friday
DATE 13th January
WEEK No. 24
START 08:45
FINISH 10:45
WIND SSE fresh, strengthening later.
TEMP 10.2-11.4 Celsius
CLOUD 85%
RAIN One short spitting shower.
OTHER
SUNRISE 08:45
SUNSET 16:43
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
08:45	BH	Ad. Win.	2	S	5	E
08:47	CM	Ad.	1	S	15	M
09:08	BH	1st Win.	1	N	5	M
09:11	BH	1st Win.	1	S	15	E
09:13	BH	Ad. Win. & 1st Win.	2	N	20	M
09:15	H.		1	S	0.5	M
09:16	MS	Ad.	1	S	0.5	M
09:20	ST		1	S	10	E
09:27	BH	Ad. Win.	1	S	20	M
09:32	BH	Ad. Win.	3	S	10-15	M
09:40	BH	Ad. Win.	1	N	10	M
09:45	BH	Ad. Win.	1	N	3-4	M
09:54	BH	Ad. Win.	1	N	7-8	M
09:59	CA		1	N	7-8	M
10:02	BH	Ad. Win.	1	N	10	M
10:09	BH	Ad. Win.	1	N	5	E
10:20	BH	Ad. Win.	1	S	5	E
10:23	MA	Pair	2	N	5	M
10:27	BH		23	N	10-15	E
10:27	BH		13	N	10-12	M
10:28	PW		1	S	5	E
10:30	H.		1	S	1	E
10:31	RO		1	S	30	W
10:32	BH	Ad. Win.	1	N	7-8	M
10:35	BH	1st Win.	1	N	5	M
10:37	L.		123	S	20	M
10:39	BH	Ad. Win.	1	S	4 down to 2	M
10:41	BH	Ad. Win.	1	S	10	M
10:42	BH	Ad. Win.	1	N	5	M
10:43	HC		1	E	5	L
10:45	BH		13	S	3-7	M

Menlo Pier (after watch): 9BH; 3CO; 6MA; 2Ad. MS.

DAY Friday
DATE 20th January
WEEK No. 25
START 10:45
FINISH 12:45
WIND W fresh to gusty.
TEMP 7.5-9.3 Celsius
CLOUD 5%, 20 % at end.
RAIN None
OTHER Wispy cloud, bright, sunny, clear.
SUNRISE 08:38
SUNSET 16:55
VP Menlo side E128165
N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
10:48	MA	Pair	2	N		M
10:49	H.		1	N	5 up to 15	M
10:55	MH		1	S		M
11:01	BH	Ad. Win.	1	S	4-5	M
11:10	RO		2	W		L
11:15	BH	Ad. Win. & 1st Win.	2	S, both turned to W after passing crossing area.	4-5	M
11:21	BH	1st Win.	1	S	4	M
11:24	CA		1	N	3-4	E
11:27	MG		1	SW	10	M
11:27	BH	Ad. Win.	1	Circled crossing area, then flew S.	20	M
11:35	BH	1st Win.	1	S	15	E
11:42	CM	Ad.	1	S	20	M
11:51	LG		1	NE	On water surface	M
11:53	HC		1	W	5	L
11:55	RO		2	NE	10	M
11:56	CM	Ad.	3	S	15	M
11:56	BH	Ad. Win.	1	S	15	M
11:59	BH	Ad. Win.	1	S	5	M
12:05	RO		2	N	5	W
12:05	JD		2	E	5	L
12:20	BH		9	S	5-8	M
12:20	SG		1	E	15	L
12:20	JD		1	W	10	L
12:29	BH	Ad. Win.	1	S	7-8	M
12:37	BH	1st Win.	1	N	3 down to 0.3	E
12:41	K.	? & ?	2	N, both hovered over reeds/river 50m upstream, then off to NW.	15	M

Menlo Pier (before watch): 17BH; 2CO; 8MA (4?); 3MS (2Ad., Juv.); MH.

DAY Friday
DATE 27th January
WEEK No. 26
START 12:45
FINISH 14:45
WIND Flat calm
TEMP 10 Celsius, falling to 5.5
CLOUD 90-100%
RAIN None
OTHER High, solid sheet of cloud
SUNRISE 08:29
SUNSET 17:08
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
12:45	JD		1	E	10	L
12:48	BH	Ad. Win.	1	S	5	M
12:51	BH	Ad. Win.	1	N	5	M
12:57	BH	Ad. Win.	1	S	7	M
13:12	BH	Ad. Win.	1	N	3-4	M
13:13	BH	Ad. Win.	1	N	3-4	W
13:13	BH	Ad. Win.	1	S	5	E
13:15	BH	Ad. Win.	1	Circled over VP, then S	15	E
13:21	BH	Ad. Win.	2	N	5	M
13:21	CM	Ad.	2	N	5	M
13:24	BH	Ad. Win.	1	N	3-4	M
13:24	BH	1st Win.	1	S	3-4	M
13:28	RO		1	NE	10	M
13:29	RO		1	E	10 up to 15	L
13:30	MA	Pair	2	N	0.3	M
13:33	MA	Pair	2	N	0.3 up to 5	M
13:40	BH	Ad. Win.	1	N	15	E
13:44	BH	Ad. Win.	1	Circled over VP twice, then S	15	E
13:47	BH	Ad. Win.	1	S	5	E
13:47	BH	Ad. Win.	1	E along crossing, turned N along E bank.	5	L
13:48	BH	Ad. Win.	1	S	3-4	E
13:49	CM	Ad.	1	N	5	E
13:49	BH	Ad. Win.	1	S	5	M
13:50	BH	Ad. Win.	1	N, landed on river in crossing area for a few seconds, then N.	2-3, 0, then 2-3	M
13:51	HC		1	SW, landed on hummock.	5 down to 3	M
13:53	HC		1	SW, landed on W bank.	5 down to 2	M
13:58	PW		1	E	2	L
13:59	CM		1	N	5	M
14:00	WP		1	W	20	L
14:00	BH	Ad. Win.	2	S	5	M
14:01	BH	Ad. Win.	1	N	3	M
14:07	BH	Ad. Win.	1	N	15	E
14:07	BH	Ad. Win.	1	N	5	M
14:07	CA	Ad.	1	S, veered away to SE after passing crossing.	20	E
14:10	CM	Ad.	1	N	3-4	M
14:10	WP		1	SW	5	M

14:11	HC		1	NE	4	M
14:11	CM	Ad.	1	N	3-4	M
14:20	WP		1	W	15	L
14:20	H.		1	N	3	W
14:37	BH	Ad. Win.	1	N	5	M
14:38	WP		1	W	15	L
14:39	BH	1st Win.	1	S	5	E
14:42	WP		1	E	15	L
14:43	BH	Ad. Win.	1	Circled low in area of crossing, landed and then flew N.	3-4, 0, then 2-3	M
14:44	WP		1	W	10	L

Menlo Pier (after watch): 19BH; 2CO; 13MA (8?).

DAY Friday
DATE 3rd February
WEEK No. 27
START 14:45
FINISH 16:45
WIND Flat calm
TEMP 9.5 Celsius, falling to 7.4
CLOUD c. 100% but thin and high
RAIN None
OTHER Misty, but visibility ok to > 100 metres.
SUNRISE 08:18
SUNSET 17:21
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
14:51	CA	Ad.	1	N	10	M
14:51	BH	Ad. Win.	1	N	5	M
14:51	WP		1	SW	15	M
14:53	BH	Ad. Win.	3	N	10	M
15:01	MH		1	S	0.3	W
15:14	BH	Ad. Win.	2	N	10	M
15:14	CA		1	S	1	M
15:17	CA		1	N	15	M
15:25	BH	Ad. Win.	3	S	10	M
15:36	BH	Ad. Win.	1	S	12	M
15:36	BH	Ad. Win.	3	N	10	M
15:37	GB	Ad.	2	N	15	E
15:37	CM	Ad.	1	N	5	E
15:40	CA	Ad.	1	S	15	M
15:40	BH	Ad. Win.	1	S	15	M
15:55	BH	Ad. Win.	3	S	3-4	M
16:13	CA		1	N	30	M
16:15	BH	Ad. Win.	2	S	5	M
16:31	BH	Ad. Win.	1	N	15	M
16:42	BH	Ad. Win.	1	S	10	M
16:43	BH	Ad. Win.	1	S	10	M

Menlo Pier (before watch): 19BH; 2CO; 4MH; 19MA.

DAY Friday
DATE 10th February 2006
WEEK No. 28
START 15:30
FINISH 17:30
WIND V. light southerly breeze.
TEMP 8.5 Celsius, 6.4 Celsius after 17:00
CLOUD 75-80+%, but high
RAIN None
OTHER
SUNRISE 08:05
SUNSET 17:35
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
15:35	BH	Ad. Win	1	S	10	M
15:41	BH	Ad. Win	2	S	10	M
15:47	BH	Ad. Win	1	N	10	M
16:06	BH	Ad. Win	2	S	15	E
16:06	CA		1	S	5	M
16:17	BH	1st Win.	1	N	10	M
16:20	CA		1	S	5	M
16:21	CM	Ad.	1	N	3-5	E
16:23	BH	Ad. Win	2	N	5	M
16:33	CA		2	S	5	M
16:39	CM	1st Win.	1	S	3	E
16:45	BH	Ad. Win	1	S	5	M
16:45	CA		1	N	25	M
16:50	BH	Ad. Win	1	S	5	M
16:50	BH	Ad. Win	1	S	7	M
16:55	MS	Pair	2	S	0.3	M
16:55	CA		1	S	0.3	W
16:55	CA		1	S through crossing , turned 10 metres after crossing and flew N	5	M
17:03	CA		1	S	5	M
17:06	MA	?	1	S	5 up to 7	M
17:08	BH	Ad. Win	1	S	15	E
17:10	CM	Ad.	1	S	15	E

Menlo Pier (after watch): 2CO; 5MH; 2MS; 39MA; 2H.

DAY Friday
DATE 17th February 2006
WEEK No. 29
START 13:30
FINISH 15:30
WIND Light SW
TEMP 7.6-9.1 Celsius
CLOUD 90-95+%
RAIN Occasional spitting
OTHER
SUNRISE 07:51
SUNSET 17:49
VP Menlo side E128165
N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
13:47	RO		1	E	15	L
13:52	SG		7	E	15	L
14:09	SH	?	1	E	10	L
14:09	RO		1	E	10	L
14:15	BH	Ad. Win.	1	N	15	E
15:01	BH	Ad. Win.	1	S along W bank, passed crossing, 20 metres later turned and retraced path back N.	10	W
15:06	WP		1	NE	15	M
15:10	CM	Ad.	1	N	20	E
15:10	BH	Ad. Win.	2	N	20	E
15:11	BH	Ad. Win.	1	N	10	M
15:12	CM	Ad.	1	N	10	W
15:13	CA		1	N	15	E
15:13	CM	Ad.	1	SW	10	M
15:16	BH	Ad. Win.	1	S	15	E
15:16	BH	Ad. Win.	3	N	25	E
15:18	RO		1	W	5-8	L
15:21	CM		1	N	15	M
15:25	CA		1	S, passed crossing and 30 metres later turned and retraced path back N.	5	M
15:27	CA	Ad. & Imm.	2	S	10	M
15:28	H.		1	N	1-2	W
15:29	CM	Ad.	1	S	8-10	M
15:29	BH	Ad. Win.	1	S	5-7	M

Menlo Pier (after watch): 12BH; 3MH; 3CO; 5MA; 2MS.

DAY Thursday
DATE 23rd February 2006
WEEK No. 30
START 11:30
FINISH 13:30
WIND V. slight N breeze
TEMP 7.7-8.9 Celsius
CLOUD 50-70%, diffuse and high.
RAIN None
OTHER Fine, hazy sun through clouds
SUNRISE 07:38
SUNSET 18:00
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
11:35	CA	Ad.	1	N, turned at crossing point, flew back S	3, 0.3	M
11:43	BH	Ad. Win.	1	N	2-3	W
12:00	BH	Ad. Win.	1	S	3-4	M
12:09	BH	Ad. Win.	3	S	10	E
12:10	MS		1	Flapped on water from crossing area N to 25 metres upstream	25	M
12:23	CA	Ad.	1	S	25	M
12:25	CM	Ad.	1	N	5	M
12:26	BH	Ad. Win.	1	N	5	M
12:29	BH	Ad. Win.	1	N	5	M
12:35	BH	Ad. Win.	1	Circled VP, then S	15, 15	M
12:37	WP		2	NE	10	M
12:37	BH	1st Win.	2	S	5	M
12:40	GO		2	E	15	L
12:42	BH	Ad. Win.	1	S until 20 m past crossing, retraced path N, landed briefly on water at crossing, then N.	1-2, 1-2	W
12:50	MA	?	1	N	1	W
12:50	CM		2	S	10	M
12:57	CM	Ad.	1	N	2-3	M
13:10	BH	Ad. Sum.	1	S through crossing, turned 50 m downstream of crossing and retraced path back to N	3-4, 3-4	W
13:14	CM	3 Ad. & Imm.	4	Circled hummock area, then N	15, 15	M
13:17	CM	Ad.	1	S	4-5	M
13:22	MA	2? + ?	3	S	10	M
13:23	BH	3 Ad. & 1st Win.	4	N, landed on river at crossing.	3-4, 0	M
13:25	BH	1st Win.	1	N	5	E
13:25	CM	Ad.	1	N	10	M
13:25	CM	Ad.	1	S	10	M
13:25	BH	Ad. Win.	1	N	10	M

Menlo Pier (after watch): 13BH; 3CO; 2MH; 23MA; 2MS

DAY Friday
DATE 3rd March 2006
WEEK No. 31
START 09:30
FINISH 11:30
WIND Flat calm
TEMP 4 Celsius (ground); 6 Celsius (air).
CLOUD 5-10%.
RAIN None
OTHER Sunny, clear. Cold at start. Menlo Pier frozen.
SUNRISE 07:20
SUNSET 18:16
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
09:31	BH	Ad. Win.	2	N	5	M
09:33	CA		1	S	10	M
09:35	BH	Ad. Sum.	1	S, turned at crossing area and retraced path N	3-4	M
09:38	BH	Ad. Sum.	2	N	5	M
09:41	BH	Ad. Sum.	1	S by W bank	2-3	W
09:41	BH	Ad. Sum.	2	N	10	M
09:41	BH	Ad. Sum.	1	N by E bank	5	E
09:53	BH	Ad. Win.	1	N by W bank	2	W
09:57	CA		5	N parallel with river, but 100 m west of W bank	30-35	W
10:04	CA		1	SE	15	M
10:04	JD		1	W	40	L
10:12	BH	1st Win.	1	N	3-4	M
10:13	BH	Ad. Win.	1	N	5	M
10:24	BH	Ad. Win.	1	S by W bank	1-2	W
10:25	BH	2-Ad. Win. & 1st Win.	3	N	5	M
10:35	BH	Ad. Sum.	1	S by W bank, passed crossing , turned c. 30m S of crossing an retraced path N	2	W
10:41	BH	Ad. Sum.	3	N	5-8	M
10:50	CA	Ad.	1	S parallel with river , but 25 m to E of E bank over woods	20	E
10:54	CA	Ad.	1	S	25	W
10:58	CA	Ad.	1	SE	15	M
11:06	BH	Ad. Win.	1	N	3-4	M
11:07	CA		1	N parallel to river, but 75 m to W of W bank	30	W
11:08	BH	Ad. Win.	1	S	5	M
11:11	WP		1	W	15 down to 5	L
11:16	GO		1	W	15	L
11:19	BH	Ad. Sum.	1	N	2-3	M
11:25	BH	2-Ad. Win. & 2-Ad. Sum.	4	S	3-4	M

Menlo Pier (after watch, water frozen): 4CO; 1 BH.

DAY Friday
DATE 10th March 2006
WEEK No. 32
START 08:00
FINISH 10:00
WIND Fresh westerly breeze
TEMP 6.2-8 Celsius
CLOUD 10-15%
RAIN None
OTHER Sunny, clear.
SUNRISE 07:03
SUNSET 18:29
VP Menlo side E128165
N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
08:05	HC		1	N	10	W
08:09	CA	Ad.	1	N	5	E
08:10	JD		3	E	10	L
08:12	BH	Ad. Win.	3	N	20	E
08:19	BH		3	N	20	E
08:23	SH		1	W	10	L
08:23	HC		2	W	10	L
08:26	HC		1	N	8-10	E
08:27	CA		2	NW	12	M
08:30	BH	Ad. Sum.	1	N	5-8	M
08:44	CA		1	SE	15	M
08:44	WP		2	N	5-8	E
08:46	CA		1	SE	15	M
08:50	K.	?	1	E	8-10	L
09:11	CM	Ad.	1	N	10	E
09:37	MA	Pair	2	SE	2-3	M
09:41	CA	Ad.	1	N	5	M
09:46	WP		1	NE	5	M
09:48	RO		1	W	15	L
09:49	HC		2	W	10 down to 2	L
09:52	BH	Ad. Sum.	1	N	3-4	M
09:55	MA	Pair	2	SE	20	M

Menlo Pier (after watch): 2CO; 2MH; 2MS; 6MA.

DAY Thursday
DATE 16th March 2006
WEEK No. 33
START 06:49
FINISH 08:49
WIND Flat calm
TEMP 4.7-5 Celsius
CLOUD 95+%, high curtain
RAIN None
OTHER
SUNRISE 06:49
SUNSET 18:40
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
06:50	MA		2	S	10	W
06:51	MH		1	N	0.3	E
06:54	MA		3	N	2-3	M
07:00	CA		3	SE	15	M
07:03	PW		1	N	15	E
07:06	LB	Ad.	1	circled crossing area, then S.	20	M
07:24	WP		1	S	10	W
07:27	HC		1	W	5	L
07:33	CA		3	NE	15	M
07:40	CA		3	N	15	E
07:48	RE		12	E	15	L
07:51	WP		1	SW	2-3	M
07:51	CA	Ad.	1	S	2	M
07:54	CA		1	S	20	M
07:56	CM	1st Win.	1	N	10	M
07:58	WP		1	N	10 down to 5	E
07:59	CM	Ad.	2	N	25	M
08:00	MA	Pair	2	In from east over woods, then N.	3-5	M
08:00	CM	1st Win.	1	N	15	M
08:02	MG		2	W	5	L
08:03	CA		1	N	20	M
08:07	CM	Ad.	1	S	15	M
08:07	BH	Ad. Sum. & 1st Win.	2	S	15	M
08:10	BH	Ad. Sum.	1	N	10	M
08:14	MG		1	E	5	L
08:14	CA		1	Circled crossing area then S.	10	M
08:14	MA		1	N	5	M
08:14	CM		1	S	25	M
08:14	CA		1	S	25	M
08:14	BH	Ad. Win.	1	N	20	E
08:18	MG		1	W	10	L
08:18	BH	Ad. Sum.	2	S	20	M
08:19	BH	Ad. Sum.	5	S	25	M
08:22	BH	Ad. Sum.	1	S	25	M
08:24	CA	Ad.	1	N	15	M
08:25	CA		1	S	25	E

08:26	BH	1st Win.	1	N	10	M
08:26	CA		1	SE	15	M
08:27	CA	Ad.	2	S	20	M
08:32	BH	Ad. Sum.	1	N	20	M
08:34	MG		2	E	15	L
08:37	WP		1	NE	10	M
08:44	CA	Ad.	1	N	15	W
08:49	BH	Ad. Sum.	1	N	5	M

Menlo Pier (after watch): 2MS; 6CO; 2MA; 3 BH; 1MH.

DAY Friday
DATE 24th March 2006
WEEK No. 34
START 08:49
FINISH 10:49
WIND V. light NE breeze, almost flat calm
TEMP 7.3-8.5 Celsius
CLOUD 100%, misty
RAIN Persistent light rain
OTHER Dull, visibility affected at 75-100 m.
SUNRISE 06:30
SUNSET 18:54
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
08:52	CA	Ad.	5	N	15	M
09:22	MA	Pair	2	Circled VP, then E.	15	L
09:36	MA	2? + ?	3	S	3-5	E
09:39	BH	Ad. Sum.	1	N	7-8	M
09:50	CA	Ad.	1	N	15	M
09:54	PW	Ad.	2	E	10	L
10:01	CM	Ad.	1	N	10	W
10:10	CA	Ad.	3	S	15	M
10:15	BH	Ad. Sum.	1	S	5	W
10:27	BH	Ad. Sum.	1	N	5	M
10:49	BH	Ad. Sum.	1	S	7-8	M
10:49	CM	Ad. & 1st Win.	2	N	10	M

Menlo Pier (after watch): 2Ad.MS; 1CO.

DAY Friday
DATE 31st March 2006
WEEK No. 35
START 10:49
FINISH 12:49
WIND Flat calm
TEMP 9-10 Celsius
CLOUD 100%
RAIN More or less continuous rain.
OTHER
SUNRISE 07:13
SUNSET 20:07
VP Menlo side E128165
N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
11:00	CA	Ad.	1	NW	10	M
11:38	CM	Ad.	2	N	20	M
11:40	CA		1	S	15	M
11:40	BH	Ad. Sum.	1	S	10	M
11:41	CA		1	N	15	M
12:05	WP		3	NE	5	M
12:10	MA	?	1	S	7-8	M
12:13	MA	Pair	2	S	15	W
12:13	CA		1	N	25	W
12:17	CA		1	S	5	E
12:20	CA		1	S	20	W
12:21	CA		1	S	20	W
12:25	CA		1	S	25	W
12:30	CA		1	N	15	M
13:32	CM	Ad.	1	N	20	M
12:32	BH	Ad. Sum.	3	N	20	M
12:35	BH	1st Win.	1	N	10	M
12:37	BH	Ad. Sum.	2	S	10	M
12:38	MS	Ad.	1	S	2-3	M
12:40	BH	1st Win.	1	N	10	M
12:40	MS	?	1	S	1	M

Menlo Pier (after watch): 2Ad.MS; 2CO.

DAY Friday
DATE 7th April 2006
WEEK No. 36
START 12:49
FINISH 14:49
WIND Fresh W breeze, veering SW and strengthening later.
TEMP 13-14 Celsius
CLOUD 65-75%
RAIN None
OTHER
SUNRISE 06:56
SUNSET 20:20
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
12:52	MA	?	1	N	0.3 up to 2	E
12:58	MS	Ad.	2	S	10	E
13:01	MA	?	1	S, veered to E at crossing area.	2	E
13:03	MA	?	1	N	5	E
13:08	MA	Pair	2	S	5	M
13:12	MA	?	1	N	5-8	E
13:30	WP		1	S	10	E
13:40	MA	?	1	SE	0.3	M
13:43	HG	Juv.	2	N	40	M
13:50	BH	Ad. Sum.	1	S	10	M
14:04	MA	Pair	2	W, circled VP, then back E.	15	L
14:04	MA	?	1	W	15, down to land on river by W bank.	L
14:11	H.		1	S, landed at crossing area.	2	W
14:11	MA	?	1	N	2-3	E
14:17	OC		70	N	10-15	E
14:22	MA		2	S, to 40 me S of crossing, then veered E.	0.3 up to 5-8	M
14:23	CA	Ad.	1	N	10	W
14:37	MA	?	2	S	20	E
14:40	CM		9	W	20-25	L
14:45	MA	?	1	S to 15 m S of crossing , then turned back N through crossing.	1, then 3	M
14:47	MA	?	1	S	15	E

Menlo Pier (after watch): CO; MA.

DAY Thursday
DATE 13th April 2006
WEEK No. 37
START 14:49
FINISH 16:49
WIND Strong W breeze
TEMP 13-16 Celsius
CLOUD 50-60%
RAIN None
OTHER
SUNRISE 06:42
SUNSET 20:31
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
14:52	CM		1	W, circled crossing area, then E.	15	L
15:12	BH	Ad. Sum.	2	W, turned midriver to S.	20	L, M
15:22	CA		1	N	10	W
15:28	CA	Ad.	1	N	15	W
15:35	MA	?	1	NW	15 m down to land on river by W bank.	M
15:36	CM	Ad.	1	N	20	M
15:36	BH	Ad. Sum.	1	N	20	M
15:36	HG	Imm.	1	W, turned to S midriver.	20	L
15:42	HC		1	W	15 down to 2	L
15:42	CM	Imm.	1	N	25	E
16:03	CA		2	N	5	M
16:11	BH	Ad. Sum.	10	S	20 up to 30	E
16:11	CM		1	S	20 up to 30	E
16:11	GB		1	S	20 up to 30	E
16:15	BH	Ad. Sum.	1	S	20-25	E
16:22	RO		2	N, turned to E at crossing.	20	E
16:29	CA	Ad.	1	SE	30	M
16:30	CA		1	S	1	M
16:33	CA		1	N	15	M
16:34	MA		1	S	20	E
16:35	K.		1	S	10	W
16:40	BH	Ad. Sum.	8	S	30	E
16:43	WP		1	W	20	L

Menlo Pier (after watch): 2Ad.MS; 2CO; 6MA; MH; 2BH; 2CM.

DAY Friday
DATE 21st April 2006
WEEK No. 38
START 16:49
FINISH 18:49
WIND Light SW breeze, died almost completely later.
TEMP 16-18 Celsius
CLOUD less than 5%
RAIN None
OTHER Sunny
SUNRISE 06:24
SUNSET 20:45
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
16:49	BH	Ad. Sum.	6	S	30	E
16:49	WP		1	E	5	L
17:01	GB	Ad.	1	W, circled crossing then back E.	40+	L
17:01	BH		3	W, circled crossing then back E.	40+	L
17:01	RO		2	N	15	E
17:17	WP		1	W	5	L
17:19	BH		11	S	40+	E
17:21	MA	?	1	S	3-4	M
17:41	MA	?	1	S	5	E
17:45	WP		1	W	15 down to 10	L
17:47	MA	?	2	S	5	E
17:52	BH		1	SW	80+	M
18:05	CA		2	SE	20	M
18:09	CA	Ad.	1	N	25	E
18:12	MA		1	S	15	E
18:12	WP		2	SW	10	M
18:14	MA	?	1	N	6-7	M
18:16	WP		1	W	5	L
18:16	MA	?	1	N	2 up to 5	E
18:18	CM		1	N	15	E
18:19	WP		1	W	10	L
18:21	MA		2	S	20	E
18:24	SL		1	W	5 down to 1	M
18:27	HG	Imm.	2	NW	20	M
18:29	WP		1	E	15	L
18:40	MA	?	2	S	10	E
18:47	SM		2	W	15	L
18:47	MA		2	S	1	M

Menlo Pier (after watch): 2Ad.MS; CO; 8MA.

DAY Friday
DATE 28th April 2006
WEEK No. 39
START 18:49
FINISH 20:49
WIND Flat calm, gentle NW breeze by end.
TEMP 15-19 Celsius
CLOUD 0%
RAIN None
OTHER
SUNRISE 06:09
SUNSET 20:58
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
19:05	WP		2	SE	10	M
19:17	MA		2	N	1	M
19:25	BH	Ad. Sum.	1	N	10	M
19:33	CM		2	N	15	M
19:54	MA		2	S	2-3	M
19:59	MS	Ad.	1	S	20	W
20:05	JD		2	N	5	W
20:15	BH	Ad. Sum.	1	N	0.3	M
20:16	MA	?	1	N	15	M
20:17	WP		1	S	10	E
20:19	MA	?	1	N	0.3	M
20:23	MA		1	N	20	W
20:23	SL		1	N	30	W
20:37	CM		1	N	20	W

Menlo Pier (before watch): Ad.MS; CO; 4MA (plus 9 chick brood).

DAY Friday
DATE 5th May 2006
WEEK No. 40
START 19:10
FINISH 21:10
WIND Fresh/brisk southerly breeze
TEMP 14-18 Celsius
CLOUD 10% at start, 60% at end.
RAIN One very short shower of a few raindrops.
OTHER
SUNRISE 05:55
SUNSET 21:10
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
19:10	GB	Ad.	1	S	5	M
19:18	HM		3	W, circled VP, then back E	15-20	L
19:19	MA		1	S	10	M
19:22	BH		2	S	15	E
19:23	CA		1	S	10	M
19:45	MA		3	S	10	M
19:46	MG		1	W	15	L
19:51	CA		4	S	15	E
20:03	MA		2	N	5	M
20:12	MA		3	SE	2	M
20:19	WP		1	N	5	W
20:33	MA		1	N	0.3	M
20:35	MG		2	W	10	L
20:35	CA		3	S	20	M
20:37	CA		1	S	20	E
20:40	MA		1	S	5 down to 2	M
20:42	WP		1	E	10 up to 15	L
20:45	CA		10	S	40	E
20:46	MA		1	S	0.3	M
20:48	CA		2	S	40	W
20:52	RM	?	1	S	25	M
20:52	CA		2	S	40	W
20:55	CA		4	S	30	M
20:59	WP		1	E	4-5	L
21:03	SL		20	N, circled VP, still feeding over crossing area at end of watch	10-15	E
21:03	SM		10	N, circled VP, still feeding over crossing area at end of watch	10-15	E
21:03	HM		20	N, circled VP, still feeding over crossing area at end of watch	10-15	E

Menlo Pier (after watch): Ad.MS; CO; 6MA; MH.

DAY Friday
DATE 12th May 2006
WEEK No. 41
START 17:10
FINISH 19:10
WIND Light northwesterly breeze
TEMP 20 down to 16.8 Celsius
CLOUD 70% at start, 100% at end.
RAIN None
OTHER Bright at start, becoming cloudier and darker later.
SUNRISE 05:42
SUNSET 21:22
VP Menlo side E128165
N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
17:18	BH	Ad. Sum	5	S	25	E
17:34	MA		1	N	3-4	E
17:40	WP		1	S	15	E
17:46	SL		1	Circling crossing then away W	30	L
17:46	WP		1	S	15	M
17:46	WP		1	E	15	L
17:46	MG		1	E	15	L
17:58	CA	Ad.	1	N	60	M
18:00	RO		4	S	30	W
18:03	WP		3	SW	15	M
18:05	WP		1	S	15	W
18:10	MA		2	E	10	L
18:15	CA		1	S	25	M
18:18	JD		1	SE	5	M
18:21	MA		1	N	20	W
18:21	MA		1	N	4	M
18:22	CA		4	Circling and slowly going S	50	M
18:22	CA		2	S	25	M
18:26	WP		1	NE	15	M
18:26	SL		1	E	15	L
18:29	MA		2	E	0.5 up to 4	L
18:30	PW		1	E	0.5	L
18:31	SL		1	W	15	L
18:32	CM	1st year	1	N	10	M
18:33	JD		2	S	15	E
18:34	JD		1	W	10	L
18:41	CM	Ad.	1	N	15	M
18:52	SL		2	Circling crossing then away S	0.1	M
18:55	H.		1	S	4	M
18:55	RO		1	S, mobbing H.	4	M
18:56	WP		1	SW	1	M
18:58	WP		1	SW	4	M
19:05	MS	Ad.	2	S	5	E

Menlo Pier (after watch): 10MA; 3CO; MH.

DAY Friday
DATE 19th May 2006
WEEK No. 42
START 15:10
FINISH 17:10
WIND Flat calm at start, southerly breeze sprang up at 16:45
TEMP 20 down to 14.7 Celsius
CLOUD 100% high blanket
RAIN One light shower at start, persistent after breeze got up.
OTHER
SUNRISE 05:31
SUNSET 21:34
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
15:19	MA	?	1	S	1	M
15:20	CM		2	N	2-3	M
15:27	BH	Ad. Sum.	1	S	0.3	M
15:33	CA		4	S	115	E
15:44	WP		3	S	5	E
15:49	JD		1	W	10	L
15:52	SL		2	S	0.15	M
15:55	GB	1 Ad. & 1 Imm.	2	S	25	M
15:55	CA		1	S	25	M
16:00	BH	Ad. Sum.	1	S	2-3	M
16:08	BH	1st year	1	S	2	M
16:10	BH	Ad. Sum.	1	N	10	M
16:10	CM		1	N	10	M
16:15	BH		6	S	20	M
16:20	CN		4	S	25	E
16:20	SL		1	E	5	L
16:22	BH	2 Ad. Sum. & 1st yr	3	S	5	M
16:23	SL		2	S	0.15	M
16:23	WP		3	S	10	W
16:23	CA	Imm.	1	S	5	M
16:24	GB	Imm.	1	S	15	M
16:24	BH	Ad. Sum.	1	S	15	M
16:25	CA		1	N	5	M
16:31	CN		2	S	40	M
16:31	CA		4	N	25	M
16:33	CM		1	S	10	M
16:33	SI		1	S	10	M
16:43	PW		1	W	1	L
16:44	MA	Pair	2	SE	15	M
16:50	HM		1	Circling crossing, then off to S	0.15-2	M
16:50	WP		1	SE	5	M
16:52	WP		2	E	4-5	L
17:00	SL		1	S	0.15	M
17:01	GB	Ad.	1	SW	15	M
17:02	MA	?	1	S	1	E
17:05	SL		1	S	0.3	M
17:09	CN		2	S	10	M

Menlo Pier (after watch): 5MA (plus brood of 12 new ducklings); 2 pairs CO (one with 5 brood, one with 6 brood).

DAY Thursday
DATE 25th May 2006
WEEK No. 43
START 13:10
FINISH 15:10
WIND Flat calm
TEMP 22 down to 20.7 Celsius
CLOUD 100% high curtain
RAIN None
OTHER Fine, clear
SUNRISE 05:22
SUNSET 21:43
VP Menlo side E128165
N228152

TIME	SPECIES	OTHER		No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
13:10	BH	Ad. Sum.		3	N	2-3	M
13:10	BH	Ad. Sum.		1	S	1	M
13:16	BH	Ad. Sum.		1	S	0.5	M
13:20	CA			1	N	0.15	M
13:22	BH	Ad. Sum.		1	N	2	M
13:27	BH	Ad. Sum.		2	N	2	M
13:28	RO			1	NW	5	M
13:29	BH	Ad. Sum.		1	S	0.5	M
13:32	BH	Ad. Sum.		4	N, circled VP several times, then continued N	15-20	E
13:32	JD			2	NW	7-8	M
13:33	SL			1	N	15	E
13:34	MS	Ad.		1	S	1	M
13:38	BH	Ad. Sum.		1	S	3	M
13:38	BH	Ad. Sum.		1	S	5	M
13:44	MA	?		1	S	5 up to 10	M
13:50	BH	Ad. Sum.		1	S	15	E
14:03	SL			1	N	0.15 up to 5	M
14:03	BH	1st yr.		1	S	10	M
14:04	CA			1	S	5	M
14:10	MS	Ad.		2	S	3-4	M
14:15	MA			1	W	0.5	L
14:19	MA			1	N	5	M
14:20	H.			1	N	5	W
14:20	BH	Ad. Sum.		2	N	5	M
14:21	MA	?		1	N	2	M
14:22	SG			9	W	6-8	L
14:28	JD			1	W	10	L
14:30	BH	Ad. Sum.		5	S	15	M
14:36	BH	Ad. Sum.		1	N	0.5	M
14:42	H.			2	S	15	E
14:44	BH	Ad. Sum.		1	S	2	M
14:53	CA			1	S	15	M
14:55	BH	Ad. Sum.		1	S	0.5	M
14:59	BH	Ad. Sum.		1	E	15	L
15:00	MA		?	1	S	2 up to 3	M

Menlo Pier (before watch): 4MA; 2 Ad. MS; 6CO (plus 9 chicks in 2 or 3 broods).

DAY Thursday
DATE 1st June 2006
WEEK No. 44
START 11:10
FINISH 13:10
WIND SW breeze, freshening later.
TEMP 17.9 up to 21.8 Celsius
CLOUD less than 5% at start, less than 1% at end.
RAIN None
OTHER Sunny, clear
SUNRISE 05:15
SUNSET 21:52
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
11:11	JD		3	NW	7-8	M
11:11	CN		1	S to 50m S crossing, fished, then back N	5	W
11:17	JD		1	S	15	M
11:25	JD		1	W	7-8	L
11:31	SL		1	W	0.1	L
11:31	SL		1	S	0.1	W
11:35	BH	1st yr.	1	S	10	M
11:35	CM	Ad.	1	S	10	M
11:47	BH	Ad. Sum.	1	N	0.5	M
11:48	SL		1	N	3 down to 0.5	M
12:04	BH	Ad. Sum.	1	S	4-5	E
12:05	BH	1st yr.	1	S	10	E
12:07	WP		1	W	10	L
12:25	BH	Ad. Sum.	1	S	1	M
12:27	CN		1	S	3	E
12:28	SG		1	W	5	L
12:36	SM		3	W, circled VP, then off to S.	20-25	L, M
12:39	BH	1st yr.	1	SW	25	M
12:39	HM		4	W, circled VP, then back E.	25-30	L
12:42	CN		2	S	3-4	M
12:52	M.		1	W	2 down to 1	L
12:56	HM		2	S	20	M
13:02	CA		1	S	20	E

Menlo Pier (after watch): 13MA; 1 Ad. MS.

DAY Friday
DATE 9th June 2006
WEEK No. 45
START 09:10
FINISH 11:10
WIND Still at start, light SW breeze by end.
TEMP 23.1-24 Celsius
CLOUD less than 5% very thin and high.
RAIN None
OTHER Sunny
SUNRISE 05:09
SUNSET 22:00
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
09:28	MA	Pair	2	S	0.3	M
09:33	BH	Ad. Sum.	1	N	3-4	M
09:43	GO		1	E	5	L
09:48	CA		3	S	50	E
09:51	SI		2	S, feeding over water, turned back and repassed crossing in N direction	0.05 up to 6-7; 5 in reverse direction	W
10:06	RB	?	1	W	2-3	L
10:08	CA		1	SE to centre of crossing, turned S along river.	25	M
10:14	CA		4	S	50	W
10:17	GO		1	E	2-3	L
10:34	CA		1	S	30	E
10:42	MG		1	W	3 down to 2	L
10:44	MA	?	1	S	10	E
10:46	WP		1	E	2	L
10:48	CA		1	SE	20	M
10:54	JD		1	S	0.3 up to 5	M
10:57	SL		1	E	0.05 up to 0.3	L
10:58	BH	Ad. Sum.	1	S	4 down to 0.3	M
11:00	MA	Pair	2	N	1	M
11:01	CA		1	SE	15	M
11:08	WP		1	SE	5	M
11:09	BH	Ad. Sum. & 1st Sum.	2	S	2-3	W

Menlo Pier (after watch): 13MA; 1 Ad. MS.

DAY Friday
DATE 16th June 2006
WEEK No. 46
START 07:10
FINISH 09:10
WIND Light SW breeze
TEMP 15.7-16 Celsius
CLOUD 100%
RAIN Persistent light spitting.
OTHER
SUNRISE 05:07
SUNSET 22:06
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
07:10	WP		1	S	10	M
07:13	SI		1	S	15	M
07:18	RB	?	1	N	5	W
07:22	MA	?	1	N	5	M
07:27	BH	Ad. Sum.	1	S	10	W
07:46	BH	Ad. Sum.	1	S	10	M
07:52	RB		1	S	5	M
08:05	CA		1	NW	15	M
08:13	RB		1	S	5	M
08:13	GO		1	W	7-8	L
08:21	CN		1	S, crossed and recrossed, then back N.	3-4	W
08:23	WP		1	SE	15	M
08:32	MA		1	N	15	E
08:33	MA		1	S	5	E
08:36	MA	?	1	S	2 up to 5	M
08:38	HG	Ad.	1	N	15	M
08:41	SI		2	N	10	M
08:41	RB		1	N	7-8	M
08:44	HM		5	E	15	L
08:45	CA		1	S	25	W
08:46	WP		2	E	15	L
08:50	CA		1	S	30	M

Menlo Pier (before watch): 2CO (plus 3 well-grown chicks); MH (plus 5 chicks); LG chick; 12MA.

DAY Friday
DATE 23rd June 2006
WEEK No. 47
START 05:00
FINISH 07:00
WIND Dead calm.
TEMP 9-10 Celsius
CLOUD 30% at start, 60% later.
RAIN None
OTHER
SUNRISE 05:08
SUNSET 22:07
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
05:05	MA	?	1	S	5	M
05:07	CA		1	NW	20	M
05:10	MA		1	S	0.3	M
05:13	CA		1	N	8	M
05:14	GB	Ad.	2	N	15	M
05:19	CA		1	S	20	M
05:23	CA	Ad.	2	N	25	M
05:23	CA		1	E	15	L
05:26	CM	Ad.	1	N	15	M
05:30	CN		1	N, fishing, recrossed twice then N.	1-3	W
05:31	GB	Ad.	1	N	25	E
05:32	CM	Ad.	6	NW	15-20	M
05:32	BH	Ad. Sum.	1	NW	15	M
05:32	GR		1	W	15	L
05:36	SI		1	N	25	W
05:42	MG		1	W	10	L
05:43	CA		1	S	80	M
05:44	MA	?	1	S	5	E
05:45	MG		1	E	10	L
05:51	GB	Ad.	1	N	30	W
05:54	CA		1	S	30	E
05:56	BH	Ad. Sum.	2	NW	50	M
05:57	CM	Ad.	2	NW	30-35	M
06:06	CA		1	N	20	M
06:07	MA	?	1	NW	20	M
06:10	CN		2	S	2	M
06:12	CN		2	N	2 up to 5	W
06:16	CA		1	N	40	E
06:18	CA		1	N	45-50	W
06:20	CA		1	S	5	M
06:21	SI		1	N	5	W
06:22	CA		1	S	30	M
06:23	BH	Ad. Sum.	1	N	20	M
06:25	CN		1	N past crossing, turned back fishing, reached crossing, then back N.	4, fishing at 0-3, then 2-3	M
06:33	WP		2	NE	10	M

06:33	CM	Ad.	1	S	15	M
06:40	BH		1	N	10	M
06:49	MS	Ad.	6	N	4	M
06:52	CA		1	S	15	M
06:52	CN		1	S, reached crossing and turned W.	1-3	W
06:54	BH	Ad. Sum.	1	N	4	M
06:54	CA		1	S	35-40	M
06:57	CU		1	SE to crossing, turned at crossing to S.	35	M

Menlo Pier (after watch): 2CO; 2MH; LG; 8MA.

DAY Friday
DATE 30th June 2006
WEEK No. 48
START 07:00
FINISH 09:00
WIND Light southwesterly breeze
TEMP 15.7-16.3 Celsius
CLOUD 50%, but thin, high and white.
RAIN None
OTHER Clear, fine.
SUNRISE 05:12
SUNSET 22:07
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
07:05	CA		1	N	25	M
07:06	WP		1	E	10	L
07:12	CN		1	N	3-4	W
07:18	MA	?	1	S	5	E
07:22	CM	Ad.	1	N	15	M
07:29	CA		1	S	20	M
07:31	SL		1	E	10	L
07:37	CA		2	N	30	W
07:40	CA		1	N	3-4	M
07:44	CA		2	SE	20	M
07:50	MA	?	1	S	2	M
07:58	MA	?	1	NW	0.5	M
07:59	BH	Ad. Sum.	1	S	15	E
08:06	GO		1	W	10	L
08:11	CA		1	S	5	M
08:18	CA		1	NW	2	M
08:22	JD		1	SW	15	M
08:28	K.	?	1	S	5	E
08:31	BH	Ad. Sum.	1	S	20	E
08:35	CA	Ad.	1	NE	10	M
08:40	CA		1	S	15	E
08:50	LB	Ad.	1	S	5	M
08:53	BH	Ad. Sum.	2	S	15	E
08:55	SL		2	N	5	E
08:55	WP		1	E	5	L

Menlo Pier (after watch): 3CO; MH; 22MA.

DAY	Sunday
DATE	9th July 2006
WEEK No.	49
START	09:00
FINISH	11:00
WIND	Strong westerly breeze.
TEMP	16 Celsius
CLOUD	50-60%
RAIN	A few spots for a few minutes near end of watch.
OTHER	Bright, but breezy.
SUNRISE	05:19
SUNSET	22:02
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
09:01	H.		1	SE	2-3	M
09:01	CN		1	N	1 up to 5 down to 1	E
09:03	CN		1	N	3-5	W
09:05	CA		1	SE	10	M
09:17	JD		1	W	15 down to 2-3	L
09:21	CA		1	SE	15	M
09:24	SI		2	Circling, moving slowly N	10	M
09:28	CN		1	N	1 up to 5 down to 1	W
09:31	WP		1	SE	10	M
09:46	CA		1	N	15-20	M
09:47	CA		1	SE	25-30	M
09:49	CN		3	N	0.5-3	M
09:52	SI		2	From E, circled, off to S	10	L, M
09:55	CN		2	N	0 (fishing) to 2	E
09:57	JD		1	W	0.5-1	L
09:57	CN		1	N	6-7	M
10:02	CA		1	SE	15	E
10:05	CN		1	N	4-5	E
10:08	CN		1	N	2-3	W
10:10	BH	Ad. Sum	1	N	10-15	W
10:14	HG	Ad.	1	N	15	M
10:14	CN		1	N	0.5-5	E
10:15	WP		1	W	10 down to 1	L
10:24	K.		1	N	1-2	W
10:30	SI		1	N	15-20	M
10:40	CN		1	N	5	W
10:44	CN		1	N	15	W
10:48	MA	?	1	N	1-2	E
10:48	CN		1	N	3-4	W
10:48	BH	Ad. Sum	1	N	0.5-2	W
10:49	GO		1	W	10-15	L
10:51	CA		2	Circling, but going E	40	L
10:51	GB	Ad.	1	N	30-35	M
10:59	GB	Ad.	1	S	15-20	M

Menlo Pier (after watch): 6CO; 3MH; 28MA; LG; MS.

DAY	Friday
DATE	14th July 2006
WEEK No.	50
START	11:00
FINISH	13:00
WIND	Very gentle southwesterly breeze.
TEMP	23-28 Celsius
CLOUD	Less than 1%.
RAIN	None
OTHER	Bright, sunny and very hot.
SUNRISE	05:25
SUNSET	21:58
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
11:00	CA		1	N	5	M
11:12	MA		1	N	4 down to 3	E
11:58	BH		5	S	75	E
12:16	MA		1	N	0.3	W
12:23	GO		1	E	15	L
12:26	BH	Ad. Sum.	1	N	5	M
12:27	SL		1	E	10	L
12:28	CM	Ad.	1	N	5	M
12:55	SL		1	N	0.15	M

Menlo Pier (after watch): 5CO; MH; 20MA.

DAY	Friday
DATE	21st July 2006
WEEK No.	51
START	14:30
FINISH	16:30
WIND	Southerly breeze.
TEMP	21-23 Celsius
CLOUD	100%
RAIN	A few spots near the end.
OTHER	Overcast, but warm.
SUNRISE	05:34
SUNSET	21:50
VP	Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
14:35	SL		1	N	0.1-0.15	M
14:45	SL		1	E	15	L
14:54	BH	Ad. Sum	1	N	3-4	W
14:54	CA		3	S	25	M
15:00	BH	Ad. Sum	1	S	5	W
15:02	BH	Ad. Sum	1	S	10	M
15:05	SL		1	S	0.15	E
15:10	JD		12	W	5-10	W
15:10	BH	2Ad. Sum & 1st yr.	3	S	15	M
15:24	MA		2	N	25-30	E
15:24	BH		1	S	10	M
15:31	CM	Ad.	1	N	15	M
15:35	LB	Ad.	1	S	10 up to 15	W
15:36	LB	Ad.	1	N	15-20	E
16:00	BH	Ad. Sum	1	S	5 down to 3	W
16:02	MA		1	N	5	E
16:15	MA		1	S	3-4	M
16:19	CA		1	S	6-7	M
16:20	SL		2	S	0.15	M
16:24	GO		1	E	15	L
16:25	BH	Ad. Sum	1	N	5	E
16:29	BH	Ad. Sum	1	S	3 up to 5	M

Menlo Pier (before watch): 8CO; MH; 29MA.

DAY Friday
DATE 28th July 2006
WEEK No. 52
START 16:30
FINISH 18:30
WIND Flat calm
TEMP 19.5 Celsius
CLOUD 100%
RAIN None
OTHER Warm, humid.
SUNRISE 05:45
SUNSET 21:39
VP Menlo side E128165 N228152

TIME	SPECIES	OTHER	No.	DIRECTION	APPROX. HEIGHT (m)	ZONE
16:30	BH	Ad. Sum	3	N	4	M
16:40	BH	Ad. Sum & 2-1st yr.	3	N	5	M
16:41	SL		1	N	4	M
16:46	CM	Ad.	1	S	5	W
16:47	SL		2	N	5	M
16:50	CM	Ad.	1	N	3-4	E
16:50	BH	Ad. Sum	1	S	5	M
16:58	BH	Ad. Sum.	1	N	5	M
16:58	GO		1	W	10	L
16:59	WP		1	E	3	L
17:00	SL		1	E	15	L
17:10	BH	Ad. Sum.	1	S	10	M
17:11	GO		1	E	20	L
17:15	BH		1	S	15	M
17:15	GB	Ad.	1	N	25	M
17:15	BH	Ad. Sum	1	N	5	W
17:16	BH	Ad. Sum	1	N	2	E
17:19	GR		1	W	15	L
17:23	CN		1	N	5	W
17:29	LB	Ad.	1	N	15	M
17:29	CM	Ad.	1	N	25	M
17:39	BH		1	S	5	M
18:05	BH	Ad. Sum	1	N	20	E
18:08	BH	Ad. Sum	1	N	25	M
18:13	GO		2	W	15	L
18:16	CA	Ad.	1	SE	15	M
18:17	SL		5	N	0-2	W
18:18	BH		1	N	25	M
18:19	MG		1	E	15	L
18:20	CM	Ad.	1	N	10	E
18:22	GO		1	W	25	L
18:23	SL		3	N	2-3	M
18:23	CN		1	S	4	M
18:25	MA		1	S	15	M
18:28	RO		1	W	5	L
18:29	BH	Ad. Sum	1	N	4	E

Menlo Pier (before watch): 4CO; 2MH; 18MA; BH.