Magellanic Plovers *Pluvianellus socialis* in southern Santa Cruz Province, Argentina

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We present results of targeted surveys and casual observations of the little-known Magellanic Plover *Pluvianellus socialis* in southern Santa Cruz Province, Argentina, during 1998–2002. Included are the first records of the species using the shores of rivers during the breeding season and observations of flocks of 123 and 145 on the Gallegos and Chico estuaries during the non breeding season. These probably represent the largest concentrations of the species ever recorded, and indicate the importance of these sites to the species' conservation.

INTRODUCTION

The relationships of the Magellanic Plover *Pluvianellus socialis* are uncertain and it has long been considered different and separated from true plovers because of various aspects of its biology, ecology and behaviour, and also because it sometimes feeds its chicks by regurgitation from the crop, the only known case among waders (see Jehl 1975).

It is an endemic species of southern Patagonia, nesting during September–February on the stony shores of inland lakes and ponds where there are also clay or mud patches in Tierra del Fuego and Santa Cruz Province, Argentina (Humphrey *et al*. 1970, Jehl 1975). The post-breeding dispersal to the coast of the Atlantic Ocean usually starts in March (*pers. obs*.), with birds regularly moving north to Río Negro Province (González 1996, Harris 1998) and occasionally as far north as Buenos Aires Province (Narosky *et al*. 1993).

Jehl (1975) suggested that the total population might be very small, probably less than 1,000 birds. It is categorized as "Near Threatened" (BirdLife International 2001), "Rare" (Grigera & Úbeda 1997) and, due to the scarcity of studies, it has been recommended as a priority case for research in Patagonia (Blanco & Canevari 1995).

STUDY AREA AND METHODS

With the aim of learning about the distribution and movements of Magellanic Plovers, we surveyed small alkaline lakes and ponds where they breed, and areas on the coast to which they migrate in winter. We present the results of specifically targeted surveys to areas with suitable habitat in the southern part of Santa Cruz Province, south of the 50ºS parallel in Patagonia, Argentina (see Fig. 1). We also include some additional casual observations made on other occasions.

On the coast of the Atlantic Ocean, the area covered included the tidal estuaries of the Gallegos (51º35'S 69º02'W), Chico (51º41'S 69º09'W), Coyle (50º58'S 69º13'W) and Santa Cruz (50º10'S 68º27'W) rivers. These were targeted because of our experience and previous knowledge of them being visited by various wader species that use the stony beaches, mudflats and salt-marshes (mainly *Salicornia ambigua*) for breeding, feeding and roosting. Also, Jehl (1975) suggests that Magellanic Plovers prefer sheltered areas, such as river mouths and bays while avoiding the exposed coast of the ocean.

The combined estuaries of the Gallegos and Chico are subject to multiple human uses, being adjacent to the city of Río Gallegos (85,000 inhabitants). In comparison, the estuaries of the Coyle and Santa Cruz are subject to far less disturbance and degradation of habitat.

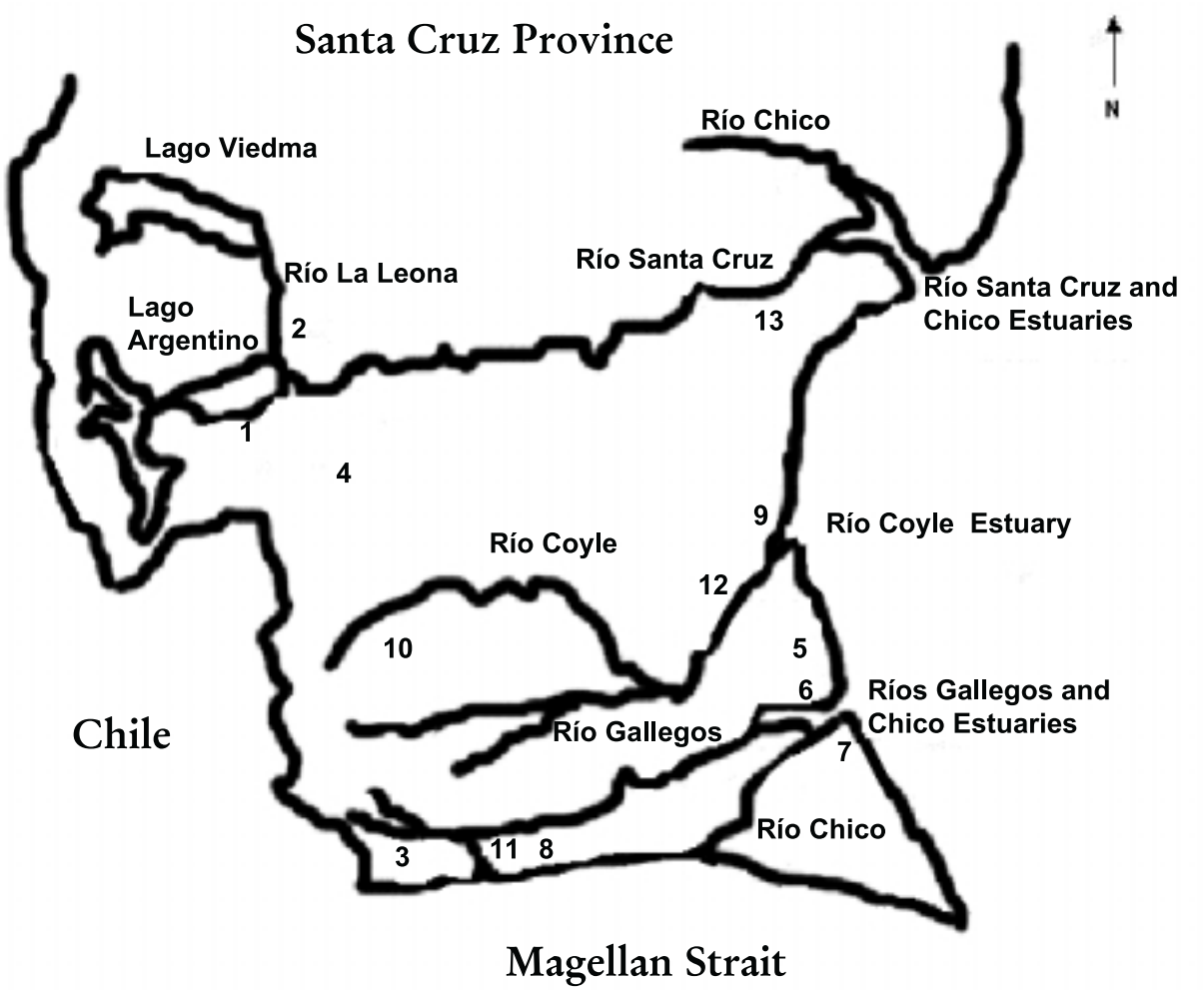
Inland, the habitat surveyed comprised mostly shallow alkaline ponds and lakes, such as Lago Argentino, that offer the beaches of intermixed pebbles and mud, favoured by Magellanic Plovers (Jehl 1975, Plate 1).

In an attempt to clarify the movements of the plovers between these two areas, and to investigate their possible use of other wetland habitats, portions of some rivers were also surveyed, despite the fact that the species has not previously been recorded as using them (Jehl 1975). The survey therefore included sections of the rivers La Leona, Penitente, Gallegos Chico, El Zurdo, Chico and Santa Cruz as well as all possible nesting habitat along the entire length of the Gallegos river from its source near the Chilean border to the sea.

The mean temperature of the study area is 7.2º C with prevailing W–SW winds averaging 35 km/h with gusts occasionally reaching 150 km/h, mainly in spring and summer.

Most inland water bodies were visited every month during the breeding season (the austral spring and summer, September–February), while the Gallegos and Chico estuaries were surveyed almost year round; other estuaries were visited mainly during winter. Observations were made from 1998 to 2002.

Most of the ponds were covered by walking the complete perimeter. Due to the size of the estuaries, lakes and rivers, fixed points were used to make the observations. It is important to note that due to factors such as winter weather conditions, accessibility and funding, we were not able to visit all of the areas during a complete year. Therefore, to some extent, our observations were not systematic.



References

1- Lago Argentino

2- Paso Biggieri, Río Leona

3- Río Gallegos, Estancia Glencross

4- Laguna de Los Escarchados

5- Estancia La Angelina

6- Río Gallegos Estuary and Isla Deseada

7- Río Chico Estuary

8- Laguna Little Hill, Estancia Morro Chico

9- Río Coyle Estuary

10- Laguna Travesia, Estancia El Roda

11- Río Penitente, Estancia Rincón de los Morros

12- Unnamed Lagoon near NR 3 (4 km N Río Coyle)

13- Unnamed Lagoon near NR 3 (40 km S Piedra Buena)

Localities of Magellanic Plover in Santa Cruz Province, Argentina

Fig. 1. Map of southern Santa Cruz Province, Argentina, showing the locations surveyed for Magellanic Plovers (numbers cross-reference with Table 1).

Plate 1. An adult Magellanic Plover on the shore of Lago Argentino on 30 November 2001 (photo by Carlos Albrieu).

Plate 2. The chick found at Estancia Glencross on the Río Gallegos on 12–13 February 2002 (Site 3, Fig. 1, Table 1; photo by Santiago Imberti).

Plate 3. Two adult Magellanic Plovers feeding on intertidal mud on the Gallegos estuary on 3 August 2002 (photo by Carlos Albrieu).

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Table 1. Counts of Magellanic Plovers at sites in southern Santa Cruz Province, Argentina, during 1998–2002. (Full = area described fully surveyed, Partial = area described partially surveyed, Casual = casual record, no systematic survey, pr = pair, juv = juvenile). Numbers correspond to location of sites in Fig. 1.

1. Lago Argentino (50°19'S, 72°16'W) – Large lake, 90 km long and 10–25 km wide, 185 m above sea level. *Nothofagus* forests in the west, arid steppe in the east. Area surveyed: 5 km of shoreline with pebbles and mud, just north of El Calafate. Land used for sheep and cattle grazing in the past but mostly for recreation or development today.

Date	25 Oct 1999	21 Oct 2000	8 Dec 2000	30 Nov 2001	22 Sept 2002
Coverage	Full	Full	Partial	Partial	Full
Count	10	5	3 (pr & juv)	2	6

2. Paso Biggieri, Río Leona (50°09'S, 72°00'W) – Large river connecting lakes Viedma and Argentino, 160 m above sea level, shrub steppe. Land used for sheep grazing.

Date	2 Dec 2001
Coverage	Casual
Count	1

3. Río Gallegos, Estancia Glencross (51°50'S, 71°33'W) – River, 330 m above sea level; nearest standing water 10 km (2 ha. lake). Area surveyed: 8 km stretch of river with pebble and sandy shores. Land used for sheep and cattle grazing.

Date	21 Mar 2001	12–13 Feb 2002	24 Mar 2002
Coverage	Casual	Full	Full
Count	2	3 (pr & chick)	5

4. Laguna de Los Escarchados (50°24'S, 71°33'W) – Lake, 2.8 km long, 740 m above sea level. Shores of pebbles surrounded by bunch-grass steppe. Area surveyed: all of the southeast shore (about 1.5 km). Severely overgrazed by sheep.

Date	11 Jan 1998	13 Mar 2001	7 Jan 2002
Coverage	Full	Full	Full
Count	2	1	5

5. Estancia La Angelina (51°25'S, 69°04'W) – Small lake, 1.2 km long, 40 m above sea level. Shores of pebbles surrounded by grassland steppe. Area surveyed: entire lake. Land used for sheep grazing.

Date	10 Feb 1999	24 Oct 1999	11 Nov 2001
Coverage	Full	Full	Full
Count	4	6 (3 pr)	11 (1 juv)

Table 1 cont. Counts of Magellanic Plovers at sites in southern Santa Cruz Province, Argentina, during 1998–2002. (Full = area described fully surveyed, Partial = area described partially surveyed, Casual = casual record, no systematic survey, pr = pair, juv = juvenile). Numbers correspond to location of sites in Fig. 1.

6. Río Gallegos Estuary (51°35'S, 69°02'W) – Extensive estuary, 40 km long, 3–8 km wide, hugely affected by tides. Extensive pebble beaches and muddy intertidal areas. Area severely affected by development, fishing, sheep grazing and recreational activities. Includes a provincial reserve, Isla Deseada, 37 ha. Area surveyed: south coast around Punta Loyola (2 km) and Isla Deseada.

Date	23 Mar 1999	23 Jun 2002	14 Jul 2002	3 Aug 2002
Coverage	Full	Full	Full	Full
Count	145*	57	44	29

* at Isla Deseada

7. Río Chico Estuary (51°41'S, 69°09'W) – Merges with the previous site (Site 6, the Río Gallegos Estuary). Smaller but includes extensive pebble and muddy intertidal areas used by Magellanic Plovers. Also affected by tides and slightly modified by development, fishing, sheep grazing and recreational activities. Part of it is a provincial reserve. Area surveyed: southeast coast (7 km).

Date	25 Apr 1999	28 Apr 1999	17 May 1999	5 May 2002
Coverage	Full	Full	Full	Full
Count	15 (8 juvs)	32	123	45 (25 juvs)

8. Laguna Little Hill, Estancia Morro Chico (51°55'S, 71°19'W) – Lake, 1.7 km long, 0.6 km wide, with a smaller lake usually connected, 0.5 km by 0.5 km, 190 m above sea level. Grassland steppe, pebble and clay shores. Area surveyed: the whole of the small lake and the south shore of the larger one. Land used for sheep grazing.

Date	31 Mar 1999	3 Oct 2001
Coverage	Casual	Full
Count	17*	3 (pr & juv)

* P. Sturzenbaum *pers. comm.*

9. Río Coyle Estuary (51°55'S, 71°19'W) – Extensive tidal estuary, 20 km long, 2–3 km wide. Extensive pebble beaches and muddy intertidal areas. Area used for fishing, sheep grazing and recreational activities. Area surveyed: 5 km of the southwest shore.

Date	24 Apr 1999	13 Jun 1999
Coverage	Casual	Full
Count	1	5

10. Laguna Travesía, Estancia El Roda (51°21'S, 71°48'W) – Large lake, 3 km long, 2.5 wide, 450 m above sea level. Grassland steppe, pebble and clay shores. Area surveyed: north shore. Land used for sheep grazing.

Date	1 Jan 2000
Coverage	Full
Count	2

11. Río Penitente, Estancia Rincón de los Morros (51°55'S, 71°30'W) – Smaller river, tributary of the Gallegos, 340 m above sea level. Grassland steppe, pebble shores. Area surveyed: 6 km. Land used for sheep and cattle grazing.

Date	14 Feb 2000	20 Jan 2002
Coverage	Partial	Full
Count	2	2

12. Unnamed Lake near National Road 3, 4 km north of Río Coyle (51°04'S, 69°32'W) – Small lake, 0.6 km long, 150 m above sea level. Shores of pebbles and clay surrounded by shrub steppe. Area surveyed: entire lake. Land used for sheep grazing.

Date	6 Dec 2000
Coverage	F
Count	4 (2 juvs)

13. Unnamed Lake near National Road 3, 40 km south of Piedra Buena (50°20'S, 69°12'W) – About 2–3 km long, 250 m above sea level. Shores of pebbles and clay surrounded by shrub steppe. Area surveyed: 1.5 km of east coast. Land used for sheep grazing.

Date	2 Dec 2002	16 Dec 2002
Coverage	Partial	Full
Count	7	7

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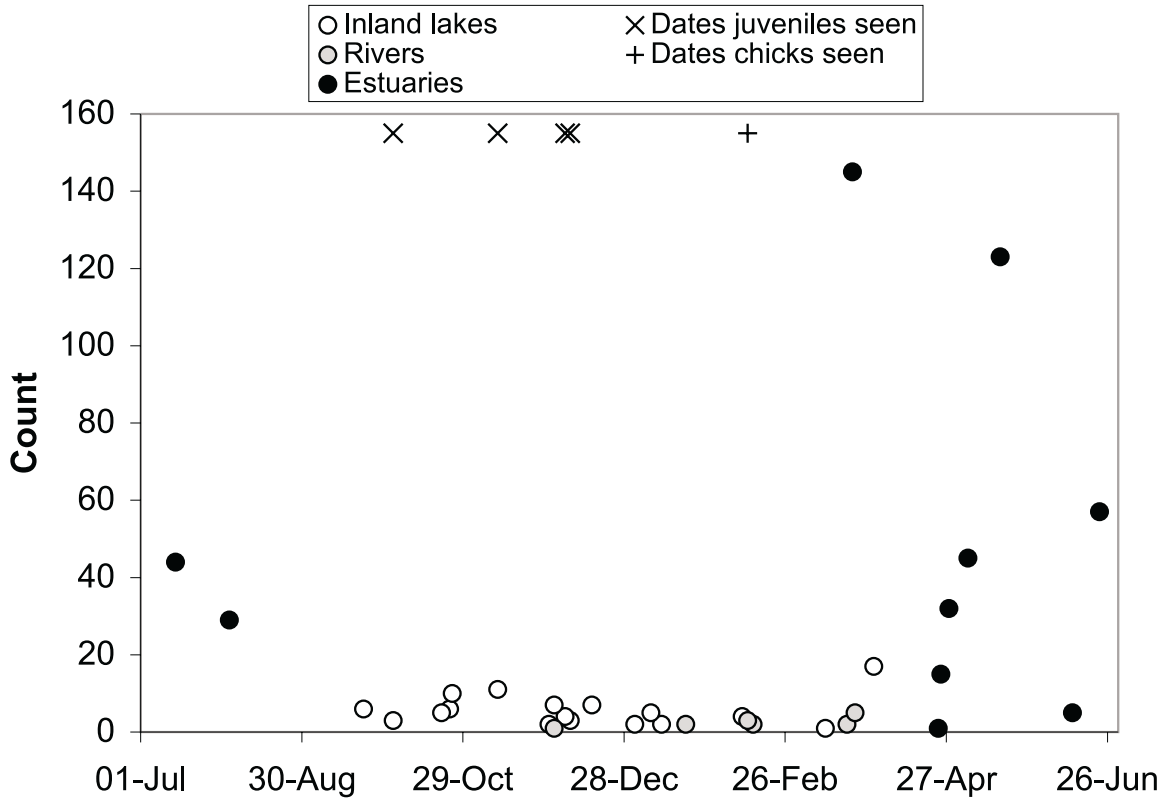

Fig. 2. Counts of Magellanic Plovers in Santa Cruz Province, Argentina, during 1998–2002 plotted separately for the three different habitats occupied (lakes, rivers and estuaries) against the annual cycle.

On the breeding grounds, all birds were aged as adults or juveniles on the basis that juveniles have white edges to their wing coverts (lacking in adults) and yellowish legs as opposed to the red legs of adults (Hayman *et al.* 1986).

RESULTS

We present a complete list of all records of Magellanic Plovers recorded during 1998–2002, including dates, localities and the number and age of birds observed (Table 1, see also Fig. 2). Locations where and visits when we recorded no plovers are not included.

DISCUSSION AND CONCLUSIONS

Our results show clear patterns of habitat use and seasonal movements in Magellanic Plovers throughout the year. This is the case despite the fact that our survey coverage was not comprehensive. The birds abandon their breeding grounds in early autumn (March–April) to spend the winter at the coast. They return inland in early spring (August–September) (Fig. 2). Besides our records presented here, this seasonality is also supported by several unreported visits that yielded negative results. These observations aimed to confirm the absence of plovers at breeding or wintering areas during the months our research indicated they should not be present. Our observations of the occurrence of Magellanic Plovers on estuaries are consistent with those of Jehl (1975) who recorded their presence on the Patagonian coast in winter.

Our observations of flocks of 123 and 145 Magellanic Plovers on the Gallegos and Chico estuaries are probably the largest aggregations of the species ever reported. Although these flocks may have included many of the same birds, they represent about 14% of the estimated world population of 1,000 (Jehl 1975). These observations therefore highlight the crucial role of these estuaries as probably the most important wintering site for the species.

Although it is clear that our observations covered a sizeable proportion of the total population, they do not enable us to make an updated estimate of what the total population size may be. The main reason is evidence that there are substantial but uncounted populations outside our study area. Some birds, for example, remain in Tierra del Fuego in winter (Johnson & Goodall 1965, Jehl 1975, L. Benegas *pers. comm.*) where the species has never been the subject of a systematic survey. Moreover, in winter, our survey was restricted to estuaries but Magellanic Plovers also occur in other coastal habitats (Narosky *et al*. 1993, González 1996). In addition, our observations of fairly large flocks are probably very unusual. Most records are of very small numbers with individuals being recorded as far north as Buenos Aires Province (Narosky *et al*. 1993). Therefore, hundreds of birds could be scattered along the Atlantic coast in winter. Altogether, these factors mean that it is impossible to arrive at a total population estimate from our observations alone. We therefore believe that a major priority for the conservation of the species should be a thorough census of the entire population throughout its range.

On the breeding grounds, suitable nesting sites appear to be scarce and this must be exacerbated by the unstable water levels of lakes and ponds. No doubt this is why the breeding density of Magellanic Plovers we found was low, though it was similar to that reported by Jehl (1975). We suppose that the birds nesting in a huge inland catchment area become

concentrated into the main wintering sites in our study area, the Gallegos and Chico estuaries. These concentrations may also include birds from elsewhere, such as the northern parts of Tierra del Fuego.

On the Gallegos and Chico estuaries, we only found Magellanic Plovers in areas that were relatively free from human disturbance or human-related change (the west shore of Río Chico, Punta Loyola and Isla Deseada). Elsewhere, apparently suitable places close to highly modified sites, such as Río Gallegos city, are avoided. We infer that Magellanic Plovers are particularly vulnerable to human disturbance and, given the large numbers of birds recorded for the area, we recommend increasing the protection of key sites for this and the other species with which it often associates (Magellanic Oystercatcher *Haematopus leucopodus*, Two-banded Plover *Charadrius falklandicus*, Rufous-chested Plover *Ch. modestus*, Baird's Sandpiper *Calidris bairdii* and White-rumped Sandpiper *C. fuscicollis*).

Although there is no mention in the literature of rivers as breeding habitat for Magellanic Plovers (Jehl 1975, Hayman *et al.* 1986, Fjeldså & Krabbe 1990), we found the species by rivers on six occasions (Fig. 2). Most significantly, one of these records related to a pair with a small chick (Site 3, Fig. 1, Table 1, Plate 2). This suggests that they nested by the river, as the closest suitable lake was about 10 km away and the chick was too young (probably <10 days) to have walked so far (Imberti 2003). It is also interesting that they were nesting so late in the season (February). This suggests either a long breeding season with the raising of two or more broods or one or more attempts after failure.

Another interesting observation was that of a pair feeding two well-developed juveniles on 6 December 2000 (Site 12, Fig. 1, Table 1). Although Magellanic Plovers lay two eggs, the weaker chick, usually the second to hatch, normally dies of starvation (Jehl 1975).

A particularly puzzling observation is that of a juvenile on the extremely early date of 3 October (Site 8, Table 1, Figs. 1 & 2). For a juvenile to have fledged by then, the egg must have been laid in early August, yet it is not thought that Magellanic Plovers start breeding until early September (Jehl 1975). It was in the company of a pair of adults and this suggests that they raised it. Therefore perhaps at least some birds nest earlier than has been recorded. An alternative explanation is that the juvenile was a bird hatched very late in the previous breeding season (such as the chick found at Site 3 on 12–13 February 2002) and still showed characteristic juvenile plumage and leg colour.

During winter, the birds fed on the estuaries in areas of soft mud and scattered pebbles, usually high in the intertidal zone, far from the waterline (Plate 3). They roosted on shingle banks or salt marshes. These observations are similar to those reported by Jehl (1975).

On their wintering grounds, probable threats to Magellanic Plovers include predation by feral animals (mostly cats and dogs) and habitat destruction due to pollution from the constant dumping of garbage and sewage as well as oil spills around Rio Gallegos city and Punta Loyola harbour. On the breeding grounds, probably the greatest danger is trampling of nests and chicks by grazing animals. Certainly we have recorded such losses in Magellanic Oystercatchers, which nest in similar habitat (*pers. obs.*).

Despite its limitations, our survey has shed new light on this little known species. However, as the Magellanic Plover has been paid scant attention by researchers and in view the importance of its conservation, many more systematic surveys and searches of potential habitat are needed. Currently, a year-round census is being carried out on the Gallegos and Chico estuaries. However, much more effort is required in other areas of high concentrations as well as less visited sites, such as the river and estuary of Rio Santa Cruz, as well as the breeding grounds.

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