

# THE VASCULAR PLANT FLORA OF THE BELLOTOS DEL MELADO NATIONAL RESERVE, VII REGION, CHILE: A DOCUMENTED CHECKLIST

## LA FLORA VASCULAR DE LA RESERVA NACIONAL BELLOTOS DEL MELADO, VII REGION, CHILE: UN CATALOGO DOCUMENTADO

Mary T. K. Arroyo<sup>1</sup>, Oscar Matthei<sup>2</sup>, Clodomiro Marticorena<sup>2</sup>, Mélica Muñoz<sup>3</sup>,  
Fernanda Pérez<sup>1</sup> and Ana María Humaña<sup>1</sup>

### ABSTRACT

The vascular plant flora of the vegetationally diverse, scenically endowed Bellotos del Melado National Reserve contained in the Chilean National Protected Area System (SNASPE) and located in the Andes of Region VII (35°S) in the mediterranean-type climate area of Chile is documented, based on intensive field exploration, and the herborization and identification of > 800 plant collections. The small reserve, covering 417 hectares, contains species and their subtaxa totaling 297, in 295 species, representing 79 families and 190 genera. 84.5% of the flora (251 species including subtaxa) is native, and 29.5% of the native flora is endemic to continental Chile. Comparison with similar or smaller-sized protected areas in the mediterranean-type climate area of Chile, for which published floristic lists are available, suggests that the Bellotos del Melado reserve is rich in relation to its size. The reserve protects the following woody species recognized to have conservation problems in the Red Book on the Chilean Native Flora: *Beilschmiedia berteroaana*, *Orites myrtoidea*, *Nothofagus glauca*, *Austrocedrus chilensis*, *Maytenus chubutensis* and *Citronella mucronata*. Five of the world's most invasive exotic species (*Conium maculatum*, *Cirsium vulgare*, *Hordeum murinum*, *Leucanthemum vulgare*, *Rumex*

*acetosella*) are found among the 46 exotic species documented for the reserve. Herbarium specimens have been deposited in CONC and SGO.

**KEYWORDS:** Bellotos del Melado National Reserve, protected area, endemism, exotic species, floristic checklist, biodiversity conservation.

### RESUMEN

Se documenta la flora vascular de la Reserva Nacional Bellotos del Melado del SNASPE chileno, ubicada en los Andes de la VII Región (35°S), en base a un programa de exploración intensiva en terreno y la herborización e identificación de > 800 colecciones. La pequeña área protegida, con una superficie de 417 hectáreas, alberga 297 especies y subtaxas, en 295 especies, en las que representan 79 familias y 190 géneros. Un 84.5% de la flora (251 especies y subtaxa) es nativa, y un 29.5% de la flora nativa es endémica a Chile continental. Una comparación de las floras de otras áreas protegidas en la zona mediterránea de Chile, para las cuales existen listas florísticas publicadas, permite sugerir que la flora de Bellotos del Melado es rica en relación a su pequeña superficie. La reserva protege las siguientes especies leñosas, reconocidas por presentar problemas de conservación en el Libro Rojo de la Flora Terrestre de Chile: *Beilschmiedia berteroaana*, *Orites myrtoidea*, *Nothofagus glauca*, *Austrocedrus chilensis*, *Maytenus chubutensis* y *Citronella mucronata*. Cinco de las especies más invasoras del mundo (*Conium maculatum*, *Cirsium vulgare*, *Hordeum murinum*, *Leucanthemum vulgare*, *Rumex acetosella*) se encuentran entre las 46 especies exóticas documentadas para la reserva. Se ha depositado material de herbario en CONC y SGO.

<sup>1</sup>Center for Advanced Studies in Ecology and Research on Biodiversity, Departamento de Biología, Facultad de Ciencias, Universidad de Chile, Casilla 653, Santiago, Chile. E-mail: southern@abello.dic.uchile.cl.

<sup>2</sup>Departamento de Botánica, Facultad de Ciencias Naturales y Oceanográficas, Universidad de Concepción, Casilla 160-C, Concepción, Chile

<sup>3</sup>Sección Botánica, Museo Nacional de Historia Natural, Casilla 787, Santiago, Chile.

**PALABRAS CLAVES:** Reserva Nacional Bellotos del Melado, área protegida, especies endémicas, especies adventicias, catálogo florístico, conservación de biodiversidad.

## INTRODUCTION

The Bellotos del Melado National Reserve, contained in the Chilean National Protected Area System (SNASPE), is located in the VII Region of Chile, toward the southern extreme of the mediterranean-type climate area (Fig. 1). The reserve derives its name from the vernacular name "belloto" of *Beilschmiedia berteroa* (Gay) Kosterm. (Lauraceae), a rare endemic tree restricted to a limited number of populations in the Coast Range and the Andes. The Bellotos del Melado protected area was established in 1995 by the Corporación Nacional Forestal (CONAF) (Muñoz *et al.* 1996). Covering an area of 417 hectares, it is located north and north-east of the confluence of Quebrada Hornillos with the Río Ancoa, on the steep southern slopes of Cerro El Melado, with near vertical rock faces from 1200-1500 m upward, and spanning an elevational gradient of 900-2010 m. Quebrada Hornillos is the main and only permanent large water course. There are several ephemeral water courses coming off Cerro Melado, which are dry during the summer months. Annual precipitation at Linares (157 m), site of the closest long-functioning weather station, is 1007 mm; mean annual temperature is 13.9°C (di Castri & Hayek 1976).

Consistent vascular plant vegetation in the reserve is found to around 1500 m, and thereafter in scattered crevices and terraces in rock faces to around 1800 m. The main vegetation types are: a) semi-open deciduous forest, dominated by *Nothofagus obliqua* (Mirb.) Oerst. (Fagaceae) (29 ha) and *Nothofagus glauca* (Phil.) Krasser (55 ha) (according to official vegetation map supplied by CONAF, VII Region) which, at lower elevations, contains many typical sclerophyllous species such as *Azara petiolaris* (D. Don) I.M. Johnst. (Flacourtiaceae), *Lithrea caustica* (Molina) Hook. et Arn. (Anacardiaceae), *Lomatia dentata* (Ruiz et Pav.) R.Br. and *L. hirsuta* (Lam.) Diels ex J.F. Macbr. (Proteaceae), with annual and perennial herbs in the understory; and at higher elevations, patches of the evergreen gymnosperm, *Austrocedrus chilensis* (D. Don) Pic. Serm. et Bizzari (Cupressaceae); b) open matorral (56 ha), dominated by the bamboo grass, *Chusquea kuleou* E. Desv. and bunch-grass like *Carex aphylla* Kunth, accompanied by species such as succulent *Puya* sp. (Bromeliaceae), and the small shrubs, *H. paucidentatus* Phil. (Compositae); c) closed evergreen forest, found

along the main permanent water course, composed of a mixture of typical mediterranean sclerophyllous trees (e.g. *Beilschmiedia berteroa* (Lauraceae), *Luna apiculata* (DC.) Burret (Myrtaceae), *Quillaja saponaria* Molina (Rosaceae)) mixed with more typical seasonal rainforest species (*Laurelia sempervirens* (Ruiz et Pav.) Tul. (Monimiaceae) and *Hydrangea serratifolia* (Hook. et Arn.) F. Phil. (Hydrangeaceae)); d) subalpine scrub, containing typical high elevation small shrubs and perennial herbs, such as *Nassauvia aculeata* (Less.) Poepp. et Endl., *Ourisia microphylla* Poepp. et Endl. (Scrophulariaceae), *Tropaeolum leptophyllum* G. Don (Tropaeolaceae) and *Viviania ovata* Phil. (Vivianiaceae). Although the major vegetation types are fully intact, evidence of sporadic selective logging in the past can be found. During the summer months, the reserve is the main conduit to summer pastures in the Linares Andes east of Cerro Melado. Large herds of cattle are passed through the southern and western sides of the reserve along wide traditional access routes to high elevation herbfields. A number of sites in deciduous *Nothofagus* forest are used annually as rest stops for the herds.

Judging by a lack of material herbarium in the two main Chilean herbaria (CONC, SGO), little, if any previous botanical work has been effected in the Bellotos del Melado reserve. As part of an ongoing effort to establish the conservation value of a number of existing state protected areas, and determine additional preservation needs of the mediterranean flora of Chile, we here provide a documented checklist of the vascular plant flora of the Bellotos del Melado Reserve, along with information on the life-forms represented in the flora and endemism status of taxa in relation to continental Chile.

## METHODS

Field exploration was carried out in December and January of the austral summer of 1999-2000. That particular summer, which came after a year of the worst drought in the century, was a very good year in central Chile for precipitation and the native flora. Direct field work involved a total of 40 man (woman)/days. Herbarium collections, totalling 824, were made at 35 localities within the reserve, and at one locality close to the CONAF headquarters

which lies outside the limits of reserve. The floristic data published here is based on 805 identifiable collections (785 within the reserve and 20 made in the vicinity of CONAF headquarters). The 35 localities spanned the entire gamut of vegetation types and altitudinal range of consistent vascular vegetation. All localities were GPS-ed (Garmin Model 12 XL) and recorded for elevation with a standard altimeter. Species were categorized according to geographic origin (endemic to the flora of continental Chile, native, but non-endemic to the flora of continental Chile, exotic) and life form according to four categories: annual to facultatively annual or biennial herbs; perennial herbs and suffrutices; shrubs; trees. Nomenclature of the identified material follows the continuously updated checklist of the Chilean flora maintained by Profesor Clodomiro Marticorena at the Universidad de Concepción, Chile. In the absence of a modern floristic treatment for Chile, endemism and life form data was compiled from standard monographic and floristic treatments, and through reference to the recently published comprehensive checklists of the flora of Argentina (Zuloaga *et al.* 1994, Zuloaga & Morrone 1996, 1999a,b). Species limited in distribution to Chilean territory as including the Juan Fernández Islands and other island territories of Chile where not considered endemic (to continental Chile) for the present purposes. In two instances (*Baccharis poeppigiana* DC. subsp. *ocellata* (Phil.) H.W. Hellwig and *Acrisione denticulata* (Hook. et Arn.) B.Nord.) where different taxonomic concepts are currently used in Chile and Argentina, we have followed biological principles with regard to endemism status. Herbarium specimens have been deposited in CONC and SGO.

## RESULTS AND DISCUSSION

A total of 297 taxa (species and subtaxa) in 295 species, representing 79 families and 190 genera were collected within the confines of the reserve (Tables 4, 5 and 6). The native flora comprises species and their subtaxa (2) totalling 251, in 249 species. The latter are contained in 77 families and 157 genera. An additional 8 species (other than those collected in the reserve) are reported as occurring around the CONAF headquarters (Table 7).

Several new records at the level of Region VII are contained in the botanical material. The taxonomic composition of the reserve flora (Table 1) reveals a strongly angiosperm-dominated flora, the only gymnosperms being *Austrocedrus chilensis* (D.Don) Pic.Serm. et Bizarri and *Ephedra chilensis* K.Presl. As in the mediterranean flora of Chile in general (Arroyo *et al.* 1995) the life-form composition of the flora is broad (Table 2), with a strong concentration of herbaceous species (71.7% of native taxa; 75.4% of native and exotic taxa combined).

Considering only the native flora, 29.5% of taxa in the reserve are endemic to continental Chile (Table 2). This percentage is fairly high, considering that the reserve contains a sizable high mountain floristic component shared with adjacent Argentina. The endemic taxa are concentrated in the deciduous and evergreen forest zones, and along the ecotone from forest to subalpine. The perennial herb category contains the highest number of Chilean endemics (> 50% of taxa). However, for a reserve that is located in the Andes, where species often cross the Andes into Argentina, levels of endemism in the woody categories are also appreciable (Table 2). Endemism in the native annual component of the reserve is relatively low. The native annual species found in the reserve, which will be recalled, is located toward the southern end of the mediterranean-type climate area, tend to be widely distributed species.

A consideration of distributions at the regional level showed that endemic *Senecio linaresensis* Soldano is restricted to Region VII. One species, endemic at the varietal level (*Mimulus luteus* L. var. *variegatus* (Lodd.) Hook.) is restricted to Regions VI and VII. The Chilean endemics, *Adesmia denticulata* Clos and *Gnaphalium landbeckii* Phil. are restricted to Regions VII and VIII. A few other species (e.g. *Rhodophiala bakeri* (Phil.) Traub, *Trisetum lechleri* (Steud.) Nicora, *Calceolaria exigua* Witasek, *Xanthium argenteum* Widder) are presently known from two geographically non-contiguous regions, but possibly will be eventually found in intervening regions upon further exploration.

Table 3 compares species richness for native species in the Bellotos del Melado reserve with other protected areas (in one case (Contulmo), including a significant area surrounding the park) in the mediterranean-type area, for which published floristic checklists are available. The Bellotos del Melado reserve appears to be floristically rich for

its area in relation to the Contulmo area and El Morado National Park. Nevertheless, given that species richness and area are not linearly correlated, a more sophisticated analysis is needed to determine whether the Bellotos del Melado reserve shows exaggerated floristic richness in relation to the mediterranean-type climate area in general.

Our work reveals that the Bellotos del Melado reserve protects a number of species formally recognized as having conservation problems in the Red Book on the Chilean Native Flora (Benoit 1989). In addition to *Beilschmiedia berteroaana* (Gay) Kosterm. (Lauraceae), which is classified as ENDANGERED at the national level, especially important from a conservation perspective are the presence of *Orites myrtoidea* (Poepp. et. Endl.) Benth. et Hook.f. ex B.D.Jacks., *Nothofagus glauca*, *Austrocedrus chilensis*, *Maytenus chubutensis* (Speg.) Lourteig, O'Donnell et Sleumer and *Citronella mucronata* (Ruiz et Pav.) D.Don, all of which are included in the list of woody species in Region VII with conservation problems. *Austrocedrus chilensis* is also classified as VULNERABLE at the national level, while *Orites myrtoidea*, *Citronella mucronata*, *Maytenus chubutensis* are considered in the RARE category at the national level. The reserve also contains *Laurelia sempervirens* (Ruiz et Pav.) Tul., considered to present conservation problems (Benoit 1989) in Region VII, but not currently included in the national list. We found a large, well conserved population of *Orites myrtoidea* between 1300-1450 m on the north-eastern side of the reserve, while *Maytenus chubutensis* was found in several locations in evergreen forest along Quebrada Hornillos at 1350-1450 m, in the forest understorey with *Austrocedrus chilensis* at 1300 m, and in subandean matorral at 1520 m. *Citronella mucronata* is locally abundant in evergreen forest along Quebrada Hornillos. *Nothofagus glauca* is the dominant tree species in 13% of the area of the reserve. Little is known about the conservation status of the vast majority of perennial herbs and annuals in Chile (Benoit 1989), comprising an outstanding 79% of the mediterranean flora (Arroyo *et al.* 1995). Exceptions are the geophytes and ferns. Some geophytes considered to have conservation problems were documented for the reserve (e.g. *Rhodophiala bakeri*). This last species, as can be stated for most showy-flowered monocotyledons in the reserve, tends to be locally distributed. For ferns, the reserve contains *Dennstaedtia glauca* (Cav.) C.Chr. ex Looser, con-

sidered in the RARE category at the national level in the Chilean Red Data Book.

Finally, we draw attention to the 46 exotic species comprising 15.5% of the vascular plant flora of the reserve (Table 1). Not unexpectedly, the majority of exotic species are annuals, and annuals are more common in the exotic flora in comparison with the native flora. Only two spontaneously establishing exotic shrubs (*Rosa canina* L. and *Rubus ulmifolius* Schott) were recorded in the reserve. *Rosa canina* is not common at present; however *Rubus ulmifolius* has taken hold of the borders of an old, still functional, water canal leading away from Quebrada Hornillos. There seem to be no naturally established exotic trees in the reserve. However, one individual of the exotic fruit tree, *Pyrus communis* L. was found in a non-disturbed natural habitat. We have excluded this species from the floristic list in Table 6, on account of it not being clear as to whether the individual observed was planted. The presence of *Pyrus communis* in the reserve possibly dates back to an earlier period when the reserve was in private hands. Although there seems to be little evidence for invasiveness in *Pyrus communis* (Holm *et al.* 1997), and *Pyrus communis* is not included in Matthei's (1995) treatise on weedy species for Chile, it would be as well to monitor any future appearances of this species in the reserve. The exotic grasses found in the reserve mostly occur in low density throughout (e.g. *Bromus hordeaceus* L., *Vulpia myuros* (L.) C.C.Gmel. var. *myuros*). Most exotic species in the reserve seem to be strongly dependent on disturbance and well lit, open habitats for establishment (e.g. *Cirsium vulgare* (Savi) Ten., *Echium vulgare* L., *Anthemis cotula* L., *Lactuca virosa* L., *Leucanthemum vulgare* Lam., *Marrubium vulgare* L., *Trifolium* spp., *Rosa canina*, *Verbascum thapsus* L., *V. virgatum* Stokes, *Rumex acetosella* L.).

Among the exotic species occurring in the reserve, the following are listed in Holm *et al.* (1997) list of the world's 200 most serious weeds:

- *Conium maculatum* L.
- *Cirsium vulgare* (Savi) Ten.
- *Hordeum murinum* L.
- *Leucanthemum vulgare* Lam.
- *Rumex acetosella* L.

The large herds of cattle passed through the southern and western sides of the reserve along the



wide traditional access routes to high elevation herbfields constitute a potential vehicle of diaspores of new exotic species, and of replacement diaspores of passing-by species already in the reserve. However, it must also be borne in mind that cattle have been passed through this area for many decades, and perhaps over a century. Thus an alternative hypothesis is that an equilibrium has already been established in terms of exotic species. The answer to this problem will only become evident with serious monitoring of the native and exotic components of the reserve. In the meantime, it is advisable that the more heavily invasive species already present in the reserve are kept under scrutiny, and records of any newly establishing exotic species reported and documented. Special care needs to be taken when opening new nature trails for the public, given the demonstrated proneness of Chile's mediterranean ecosystems to invasion, and the strong correlation between the frequency of exotic species and the density of penetration routes in Chile (Arroyo *et al.* 2000). It is widely appreciated that strongly invasive exotic species may pose a risk to native biodiversity (Simberloff 1997). Many exotic species may not constitute a real risk to native biodiversity; however, exotics do have the effect of homogenizing floras, thereby lowering the uniqueness, and sustainable development value of a country's national parks and reserves.

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#### REFERENCES

- ARROYO, M.T.K., L. CAVIERES, C. MARTICORENA & M. MUÑOZ. 1995. Convergence in the mediterranean floras of central Chile and California: Insights from comparative biogeography. *In*: ARROYO, M.T.K., M. FOX & P. ZEDLER (Eds.), Ecology and biogeography of mediterranean ecosystems in Chile, California and Australia. Springer-Verlag, New York, pp. 43-88.
- ARROYO, M.T.K., C. MARTICORENA, O. MATTHEI & L. CAVIERES. 2000. Plant invasions in Chile: Present patterns and future predictions. *In*: MOONEY, H.A. & R.J. HOBBS (Eds.), Invasive species in a changing world. Island Press, pp. 385-421.
- BAEZA, C.M., C. MARTICORENA & R. RODRÍGUEZ. 1999. Catálogo de la flora vascular del Monumento Natural Contulmo, Chile. *Gayana Bot.* 56: 125-135.
- BEENOIT, I.L. 1989. Libro rojo de la flora terrestre de Chile. CONAF, Chile. 157 pp.
- DI CASTRI, F. & E.R. HAJEK. 1976. Bioclimatología de Chile. Dirección de Investigación, Vicerrectoría Académica, Universidad Católica de Chile. Santiago. 128 pp.
- DONOSO, C. & L. LANDRUM. 1976. *Nothofagus leonii*. Hibridación e introgresión en poblaciones de *Nothofagus obliqua* y *Nothofagus glauca*. *Bol. Técn. Fac. Ci. Forest. Univ. Chile.* 36: 5-29.
- HOLM, L., J. DOLL, E. HOLM, J. PANCHO & J. HERBERGER. 1997. World weeds. Natural histories and distribution. John Wiley and Sons, Inc., New York. 1129 pp.
- MATTHEI, O. 1995. Manual de las malezas que crecen en Chile. Alfabetá Impresores, Santiago, Chile. 545 pp.
- MUÑOZ, C. & E. PISANO. 1947. Estudio de la vegetación y flora de los Parques Nacionales de Fray Jorge y Talinay. *Agríc. Técn.* 7(2): 71-190.
- MUÑOZ, M., H. NÚÑEZ & J. YÁÑEZ, editors. 1996. Libro rojo de los sitios prioritarios para la conservación de la diversidad biológica en Chile. Ministerio de Agricultura, Corporación Nacional Forestal, Santiago. 203 pp.
- SIMBERLOFF, D. 1997. Nonindigenous species: A global threat to biodiversity and stability. *In*: RAVEN, P.H. (Ed.), Nature and human society. The quest for a sustainable world. National Academy Press, Washington, D.C., pp. 325-334.
- TELLIER, S., A. HOFFMANN, F. SAavedra & L. PAUCHARD. 1994. Flora del Parque Nacional El Morado (Región Metropolitana, Chile). *Gayana Bot.* 51: 13-47.

TRUMPLER, K. 1998. Systematisch-taxonomische Untersuchungen chilenischer Pitcairnioideae (Bromeliaceae). Diplomarbeit, Johan Wolfgang Goethe-Universität, Frankfurt am Main (iii), 131, (xii) pp.

ZULOAGA, F.O., E.G. NICORA, Z.E. RÚGOLO DE AGRASAR, O. MORRONE, J. PENSIERO & A.M. CIALDELLA. 1994. Catálogo de la familia Poaceae en la República Argentina. Missouri Botanical Garden, St. Louis. 178 pp.

ZULOAGA, F.O. & O. MORRONE (Eds.). 1996. Catálogo de

las plantas vasculares de la República Argentina I. Missouri Botanical Garden, St. Louis. 323 pp.

ZULOAGA, F.O. & O. MORRONE. 1999a. Catálogo de plantas vasculares de la República Argentina II. Acanthaceae - Euphorbiaceae (Dicotyledoneae). Missouri Botanical Garden, St. Louis. 621 pp.

ZULOAGA, F.O. & O. MORRONE. 1999b. Catálogo de plantas vasculares de la República Argentina II. Fabaceae - Zygophyllaceae (Dicotyledoneae). Missouri Botanical Garden, St. Louis. 648 pp.

TABLE 1. Taxonomic composition of the vascular plant flora of Bellotos del Melado National Reserve, VII Region, Chile. Numbers refer to species and subtaxa combined. Total subtaxa = 2. PTERI = Pteridophyta; PINOP = Pinophyta; DICOT = Dicotyledoneae; MONOC = Monocotyledoneae.

TABLA 1. Composición taxonómica de la flora vascular de la Reserva Nacional Bellotos del Melado, VII Región, Chile. Los números se refieren al número total de especies y subtaxa incluidos. Total de subtaxa = 2. PTERI = Pteridophyta; PINOP = Pinophyta; DICOT = Dicotyledoneae; MONOC = Monocotyledoneae.

|                              | PTERI      | PINOP     | DICOT        | MONOC       | TOTAL        |
|------------------------------|------------|-----------|--------------|-------------|--------------|
| <i>Total native taxa</i>     | 15 (6.0 %) | 2 (0.8 %) | 184 (73.3 %) | 50 (19.9 %) | 251 (84.5 %) |
| Native, non endemic          | 15 (8.5 %) | 2 (1.1 %) | 120 (67.8 %) | 40 (22.6 %) | 177 (70.5 %) |
| Endemic to continental Chile | 0 (0.0 %)  | 0 (0.0 %) | 64 (86.5 %)  | 10 (13.5 %) | 74 (29.5 %)  |
| <i>Exotic taxa</i>           | 0 (0.0 %)  | 0 (0.0 %) | 35 (76.1 %)  | 11 (23.9 %) | 46 (15.5 %)  |
| Total flora                  | 15 (5.1 %) | 2 (0.7 %) | 219 (73.7 %) | 61 (20.5 %) | 297          |

TABLE 2. Life forms in the native and exotic flora of the Bellotos del Melado National Reserve, Region VII, Chile.

TABLA 2. Formas de vida en la flora nativa y adventicia de la Reserva Nacional Bellotos del Melado, VII Región, Chile.

|                              | Annual*<br>herbs | Perennial**<br>herbs | Shrubs      | Trees       | Total        |
|------------------------------|------------------|----------------------|-------------|-------------|--------------|
| <i>Total native taxa</i>     | 23 (9.2 %)       | 157 (62.5 %)         | 48 (19.1 %) | 23 (9.2 %)  | 251 (84.5 %) |
| Native, non endemic          | 13 (7.3 %)       | 118 (66.7 %)         | 34 (19.2 %) | 12 (6.8 %)  | 177 (70.5 %) |
| Endemic to continental Chile | 10 (13.5 %)      | 39 (52.7 %)          | 14 (18.9 %) | 11 (14.9 %) | 74 (29.5 %)  |
| <i>Exotic taxa</i>           | 27 (58.7 %)      | 17 (37.0 %)          | 2 (4.3 %)   | 0 (0.0 %)   | 46 (15.5 %)  |
| Total flora                  | 50 (16.8 %)      | 174 (58.6 %)         | 50 (16.8 %) | 23 (7.7 %)  | 297          |

\* Includes biennials and some facultative annuals.

\*\* Includes suffrutices.

TABLE 3. Species and generic richness (native) for protected areas in central Chile with published species lists.

TABLA 3. Riqueza específica y genérica (nativa) para unidades del SNASPE en la zona mediterránea de Chile donde existen listas florísticas publicadas.

| Protected Area (Latitude)                  | Source                        | Area (ha) | Species richness | Generic richness |
|--|-------------------------------|-----------|------------------|------------------|
| Bellotos del Melado (35°S)                 | Present publication           | 417       | 249              | 157              |
| Contulmo area <sup>a</sup> (38°S)          | Baeza <i>et al.</i> (1999)    | Ca. 6540  | 248              | 171              |
| El Morado <sup>b</sup> (34°S)              | Teillier <i>et al.</i> (1994) | 3000      | 246              | 140              |
| Fray Jorge and Talinay <sup>c</sup> (30°S) | Muñoz & Pisano (1947)         | 959       | 368              | 219              |

<sup>a</sup>: The area studied includes the Contulmo National Monument and additional surrounding land. <sup>b</sup>: Nomenclatura follows Chilean flora data base. <sup>c</sup>: Numbers are approximate due to uncertain origins of some species.

TABLE 4. Endemic flora (restricted to the area of continental Chile) of the Bellotos del Melado National Reserve, Region VII, Chile. A: Annual; B: Biennial herb; H: Perennial herb; S: Suffrutice; F: Shrub; T: Tree. All cited collection numbers are those of Arroyo *et al.*

TABLE 4. Taxa endémicos (restringidos al área de Chile continental) de la Flora de la Reserva Nacional Bellotos del Melado, VII Región, Chile. A: Hierba anual; B: Hierba bienal; H: Hierba perenne; S: Sufrutice; F: Arbusto; T: Arbol. Las muestras de herbario citadas son de Arroyo *et al.*

## DICOTYLEDONEAE

### ANACARDIACEAE

1. T *Lithrea caustica* (Molina) Hook. et Arn.  
994857 (CONC); 994916 (CONC); 994950 (CONC); 996130 (CONC).

### ASCLEPIADACEAE

2. F *Diplolepis menziesii* J.H.Schult.  
994866 (CONC); 996141 (CONC).

### BERBERIDACEAE

3. F *Berberis actinacantha* Mart.  
20105 (CONC, SGO); 20141 (CONC); 994862 (CONC, SGO); 994900 (CONC, SGO); 996235 (CONC, SGO); 996275 (CONC).
4. F *Berberis rotundifolia* Poepp. et Endl.  
20127 (CONC).

### BORAGINACEAE

5. F *Cynoglossum paniculatum* Hook. et Arn.  
20147 (CONC, SGO).

### COMPOSITAE

6. A *Chaetanthera tenella* Less. var. *tenella*  
994903 (CONC, SGO).
7. H *Gnaphalium landbeckii* Phil.  
20102 (CONC).
8. F *Gochmatia foliolosa* (D.Don) D.Don ex Hook. et Arn. var. *foliolosa*  
994869 (CONC, SGO); 996139 (CONC, SGO).
9. H *Haplopappus macrocephalus* (Poepp. ex Less.) DC.  
20179 (CONC); 996030 (CONC); 996193 (CONC, SGO).

10. H *Hypochoeris apargioides* Hook. et Arn.  
20058 (CONC, SGO).
11. H *Hypochoeris thrincoides* (J.Remy) Reiche  
996251 (CONC, SGO).
12. H *Leucheria hieracioides* Cass.  
20089 (CONC, SGO); 994808 (CONC, SGO); 994901 (CONC); 994973 (CONC, SGO); 994988  
(CONC); 996150 (CONC, SGO); 996185 (CONC, SGO).
13. F *Mutisia subulata* Ruiz et Pav. f. *rosmarinifolia* (Poepp. et Endl.) Cabrera  
996358 (CONC, SGO).
14. F *Mutisia ilicifolia* Cav. var. *ilicifolia*  
996137 (CONC, SGO); 996211 (CONC); 996221 (CONC); 996231 (CONC).
15. S *Mutisia brachyantha* Phil.  
20142 (CONC); 996199 (CONC, SGO); 996247 (CONC, SGO); 996272 (CONC, SGO); 996376  
(CONC, SGO).
16. F *Proustia pyrifolia* DC.  
994848 (CONC, SGO); 994951 (CONC, SGO); 994984 (CONC); 996229 (CONC, SGO).
17. S *Senecio lastarrianus* J.Remy  
20153 (CONC, SGO).
18. S *Senecio linarensis* Soldano  
20133 (CONC, SGO); 996250 (CONC, SGO); 996308 (CONC, SGO); 996419 (CONC).
19. A *Xanthium argenteum* Widder  
994891 (CONC).

#### ESCALLONIACEAE

20. F *Escallonia illinita* K.Presl  
20042 (CONC, SGO); 996195 (CONC); 996201 (CONC, SGO); 996378 (CONC, SGO).

#### EUPHORBIACEAE

21. F *Colliguaja dombeyana* A.Juss.  
994822 (CONC, SGO); 994909 (CONC, SGO); 996179 (CONC).

#### FAGACEAE

22. T *Nothofagus glauca* (Phil.) Krasser  
994830 (CONC, SGO); 994883 (CONC); 996165 (CONC, SGO).

#### FLACOURTIACEAE

23. T *Azara petiolaris* (D.Don) I.M.Johnst.  
994824 (CONC); 994906 (CONC); 996096 (CONC); 996125 (CONC).

#### FRANCOACEAE

24. H *Francoa appendiculata* Cav.  
20022 (CONC); 20086 (CONC); 994801 (CONC); 994998 (CONC); 996181 (CONC); 996328 (CONC).

#### GERANIACEAE

25. H *Geranium commutatum* Steud.  
996074 (CONC, SGO); 996124 (CONC); 996081-A (CONC).

#### ICACINACEAE

26. T *Citronella mucronata* (Ruiz et Pav.) D.Don  
994939 (CONC, SGO); 996167 (CONC); 996215 (CONC).

#### LABIATAE

27. F *Satureja gilliesii* (Graham) Briq.  
994811 (CONC); 994885 (CONC, SGO); 996186 (CONC, SGO); 996322 (CONC, SGO).
28. F *Teucrium bicolor* Sm.  
996119 (CONC, SGO); 996223 (CONC, SGO); 996224 (CONC, SGO); 996258 (CONC, SGO).

#### LAURACEAE

29. T *Beilschmiedia berteriana* (Gay) Kosterm.  
996006 (CONC, SGO).



30. T *Cryptocarya alba* (Molina) Looser  
994819 (CONC); 996142 (CONC); 996164 (CONC).

**LOASACEAE**

31. AH *Loasa artemisiifolia* Poepp. ex Urb. et Gilg  
20074 (CONC. SGO); 994874 (CONC. SGO); 996044 (CONC. SGO); 996182 (CONC); 996225 (CONC. SGO); 996333 (CONC); 996374 (CONC); 996417 (CONC).
32. A *Loasa micrantha* Poepp.  
994995 (CONC. SGO); 996218 (CONC. SGO); 996278 (CONC. SGO).

**MONIMIACEAE**

33. T *Laurelia sempervirens* (Ruiz et Pav.) Tul.  
994888 (CONC. SGO); 996117 (CONC).
34. T *Peumus boldus* Molina  
994881-A (CONC); 996101 (CONC).

**OXALIDACEAE**

35. AB *Oxalis clandestina* Phil.  
996076 (CONC. SGO).
36. A *Oxalis rosea* Jacq.  
994798 (CONC); 996056 (CONC); 996134 (CONC); 996219 (CONC).

**PAPILIONACEAE**

37. H *Adesmia araucana* Phil.  
20011 (CONC); 994818 (CONC); 994985 (CONC); 996040 (CONC); 996248 (CONC); 996298 (CONC); 996315 (CONC); 996393 (CONC).
38. S *Adesmia denticulata* Clos  
20132 (CONC); 994884 (CONC); 994924 (CONC); 996152 (CONC).
39. H *Adesmia prostrata* Clos var. *eglandulosa* Burkart  
20097 (CONC. SGO).
40. H *Lathyrus subandinus* Phil.  
20120 (CONC); 996151 (CONC); 996261 (CONC).
41. T *Saphora macrocarpa* Sm.  
994886 (CONC); 996145 (CONC); 996363 (CONC).

**POLEMONIACEAE**

42. A *Collomia cavanillesii* Hook. et Arn.  
20090 (CONC); 994872 (CONC); 996011 (CONC); 996356 (CONC. SGO).

**PORTULACACEAE**

43. H *Cistanthe grandiflora* (Lindl.) Schldt.  
996238 (CONC).

**RHAMNACEAE**

44. F *Retanilla stricta* Hook. et Arn.  
994876 (CONC); 996160 (CONC); 996214 (CONC. SGO).

**ROSACEAE**

45. T *Kageneckia oblonga* Ruiz et Pav.  
994993 (CONC); 996166 (CONC); 996190 (CONC); 996230 (CONC).
46. T *Quillaja saponaria* Molina  
994823 (CONC); 996116 (CONC).

**RUBIACEAE**

47. H *Galium araucanum* Phil.  
20108 (CONC).
48. AH *Galium diffusoramosum* Dempter et Ehrend.  
994967 (CONC. SGO); 996410 (CONC)
49. H *Galium trichocarpum* DC.  
994817 (CONC); 996163 (CONC); 996192 (CONC).

**SCROPHULARIACEAE**

50. S *Calceolaria andina* Benth.  
994965 (CONC).
51. H *Calceolaria cana* Cav.  
20125 (CONC); 994815 (CONC); 996257 (CONC); 996282 (CONC).
52. HS *Calceolaria corymbosa* Ruiz et Pav.  
996043 (CONC); 996157 (CONC); 996400 (CONC, SGO).
53. F *Calceolaria exigua* Witasck  
996175 (CONC, SGO); 996303-A (CONC).
54. S *Calceolaria glabrata* Phil.  
20046 (CONC); 994812 (CONC); 994831 (CONC); 996303 (CONC, SGO).
55. H *Calceolaria paralia* Cav.  
996345 (CONC, SGO).
56. S *Calceolaria pseudoglandulosa* Clos  
20026 (CONC); 994921 (CONC); 996005 (CONC, SGO).
57. AH *Mimulus luteus* L. var. *variegatus* (Lodd.) Hook.  
20024 (CONC); 20053 (CONC, SGO); 994994 (CONC).

**SOLANACEAE**

58. H *Solanum etuberosum* Lindl.  
20181 (CONC, SGO); 994955 (CONC).

**TROPAEOLACEAE**

59. H *Tropaeolum ciliatum* Ruiz et Pav. subsp. *septentrionale* Sparre  
20078 (CONC, SGO); 20159 (CONC, SGO); 996000 (CONC, SGO).
60. H *Tropaeolum tricolor* Sweet  
996227 (CONC); 996279 (CONC); 996353 (CONC); 996394 (CONC).

**UMBELLIFERAE**

61. H *Azorella spinosa* (Ruiz et Pav.) Pers.  
20067 (CONC, SGO); 20098 (CONC, SGO); 994959 (CONC, SGO); 996183 (CONC, SGO); 996426 (CONC, SGO).

**VALERIANACEAE**

62. A *Valeriana crispa* Ruiz et Pav.  
994946 (CONC, SGO); 996197 (CONC, SGO); 996416 (CONC).
63. H *Valeriana verticillata* Clos  
20096 (CONC); 996054 (CONC); 996404 (CONC, SGO).

**VIVIANIACEAE**

64. HF *Cissarobryon elegans* Kunze ex Poepp.  
20009 (CONC); 20082 (CONC, SGO); 996032 (CONC); 996274 (CONC); 996405 (CONC).

**MONOCOTYLEDONEAE**

**ALSTROEMERIACEAE**

1. H *Alstroemeria ligtu* L. subsp. *ligtu*  
20094 (CONC, SGO); 994797 (CONC, SGO); 994844 (CONC, SGO); 996024 (CONC, SGO); 996178 (CONC); 996321 (CONC, SGO).
2. H *Alstroemeria presliana* Herb. subsp. *australis* Ehr.Bayer  
20023 (CONC); 996014 (CONC); 996320 (CONC); 996401 (CONC).
3. H *Bomarea salsilla* (L.) Herb.  
994813 (CONC); 994847 (CONC); 994911 (CONC).

**AMARYLLIDACEAE**

4. H *Rhodophiala bakeri* (Phil.) Traub  
20169 (CONC).

**BROMELIACEAE**

5. H *Ochagavia carnea* (Beer) L.B.Sm. et Looser  
994943 (CONC, SGO); 996234 (CONC, SGO).

**DIOSCOREACEAE**

6. H *Dioscorea andina* Phil.  
20070 (CONC); 20164 (CONC, SGO).  
7. H *Dioscorea nervosa* Phil.  
20039 (CONC); 994845 (CONC); 994937 (CONC); 994961 (CONC, SGO); 996158 (CONC, SGO).

**IRIDACEAE**

8. H *Libertia sessiliflora* (Poepp.) Skottsb.  
994802 (CONC, SGO); 994854 (CONC); 994948 (CONC).

**ORCHIDACEAE**

9. H *Chloraea galeata* Lindl.  
994810 (CONC); 996254 (CONC, SGO).  
10. H *Chloraea nudilabia* Poepp.  
20137 (CONC); 996035 (CONC); 996249 (CONC); 996330 (CONC); 996402 (CONC).

TABLA 5. Non-endemic native flora of the Bellotos del Melado National Reserve, Region VII, Chile. A: Annual herb; B: Biennial herb; H: Perennial herb; S: Suffrutice; F: Shrub; T: Tree. All cited collection numbers are those of Arroyo *et al.*

TABLA 5. Taxas nativos no endémicos de la flora de la Reserva Nacional Bellotos del Melado, VII Región, Chile. A: Hierba anual; B: Hierba bienial; H: Hierba perenne; S: Sufrutice; F: Arbusto; T: Arbol. Las muestras de herbario citadas son de Arroyo *et al.*

**PTERIDOPHYTA**

**ADIANTACEAE**

1. H *Adiantum chilense* Kaulf. var. *chilense*  
20019 (CONC, SGO); 994871 (CONC); 994908 (CONC); 996220 (CONC, SGO).  
2. H *Adiantum scabrum* Kaulf.  
996162 (CONC).  
3. H *Adiantum sulphureum* Kaulf.  
994846 (CONC, SGO); 994851 (CONC, SGO); 994962 (CONC, SGO).  
4. H *Cheilanthes glauca* (Cav.) Mett.  
20130 (CONC, SGO); 994975 (CONC, SGO); 996305 (CONC); 996397 (CONC).  
5. H *Cheilanthes hypoleuca* (Kunze) Mett.  
994927 (CONC); 996189 (CONC); 996236 (CONC).  
6. H *Cryptogramma fumariifolia* (Phil. ex Baker) H.Christ  
20062 (CONC, SGO); 994912

**ASPLENIACEAE**

7. H *Pleurosorus papaverifolius* (Kunze) Fée  
996058 (CONC).

**BLECHNACEAE**

8. S *Blechnum cordatum* (Desv.) Hieron.  
20003 (CONC, SGO); 994964 (CONC, SGO).  
9. H *Blechnum hastatum* Kaulf.  
994842 (CONC, SGO); 996039 (CONC); 996135 (CONC, SGO); 996140 (CONC).  
10. H *Blechnum microphyllum* (Goldm.) C.V.Morton  
20114 (CONC, SGO).

**DENNSTAEDTIACEAE**

11. H *Dennstaedtia glauca* (Cav.) C.Chr. ex Looser  
20006 (CONC, SGO); 994936 (CONC, SGO).

**DRYOPTERIDACEAE**

12. H *Polystichum chilense* (H.Christ) Diels  
994849 (CONC, SGO); 994960 (CONC); 994969 (CONC); 996002 (CONC); 996004 (CONC, SGO);  
996138 (CONC, SGO); 996213 (CONC).
13. H *Polystichum plicatum* (Poepp. ex Kunze) Hicken  
20001 (CONC, SGO); 20050 (CONC, SGO).

**EQUISETACEAE**

14. H *Equisetum bogotense* Kunth  
20155 (CONC, SGO); 994932 (CONC).

**WOODSIACEAE**

15. H *Cystopteris fragilis* (L.) Bernh. var. *apiiformis* (Gand.) C.Chr.  
20049 (CONC).

**PINOPHYTA**

**CUPRESSACEAE**

1. T *Austrocedrus chilensis* (D.Don) Pic.Serm. et Bizzarri  
994941 (CONC); 994991 (CONC); 996169 (CONC); 996240 (CONC); 996295 (CONC).

**EPHEDRACEAE**

2. F *Ephedra chilensis* K.Presl  
20134 (CONC, SGO); 996281 (CONC, SGO); 996347 (CONC); 996352 (CONC, SGO); 996423 (CONC, SGO).

**DICOTYLEDONEAE**

**AEXTOXICACEAE**

1. T *Aextoxicon punctatum* Ruiz et Pav.  
994944 (CONC).

**ANACARDIACEAE**

2. F *Schinus patagonica* (Phil.) I.M.Johnst. ex Cabrera  
20000 (CONC, SGO); 994999 (CONC); 996149 (CONC, SGO); 996364 (CONC, SGO); 996390 (CONC).
3. FT *Schinus polygama* (Cav.) Cabrera  
996120 (CONC).

**ASCLEPIADACEAE**

4. S *Cynanchum nummulariifolium* Hook. et Arn.  
20007 (CONC); 996300 (CONC); 996334 (CONC); 996415 (CONC); 996429 (CONC).

**BERBERIDACEAE**

5. F *Berberis trigona* Kunze ex Poepp. et Endl.  
20178 (CONC).

**BUDDLEJACEAE**

6. T *Buddleja globosa* Hope  
20004 (CONC); 994910 (CONC); 996365 (CONC).

**CAESALPINIACEAE**

7. F *Senna armottiana* (Gillies ex Hook. et Arn.) H.S.Irwin et Barneby  
20116 (CONC).

**CARYOPHYLLACEAE**

8. H *Paronychia chilensis* DC.  
996110 (CONC).

**CELASTRACEAE**

9. T *Maytenus boaria* Molina

- 20036 (CONC. SGO); 994929 (CONC).  
 10. F *Maytenus chubutensis* (Speg.) Lourteig, O'Donnell et Sleumer  
 20136 (CONC); 994996 (CONC); 996293 (CONC); 996370 (CONC); 996380 (CONC).

#### CHENOPODIACEAE

11. H *Chenopodium ambrosioides* L.  
 994879 (CONC); 996264 (CONC).

#### COMPOSITAE

12. FT *Acrisione denticulata* (Hook. et Arn.) B.Nord.  
 994832 (CONC. SGO); 994983 (CONC. SGO); 996228 (CONC).  
 13. H *Aster glabrifolius* (DC.) Reiche  
 20017 (CONC); 20099 (CONC).  
 14. F *Baccharis magellanica* (Lam.) Pers.  
 996348 (CONC. SGO).  
 15. F *Baccharis poeppigiana* DC. subsp. *ocellata* (Phil.) F.H.Hellwig  
 20061 (CONC. SGO); 20072 (CONC. SGO); 20103 (CONC. SGO); 20138 (CONC. SGO); 996131  
 (CONC. SGO); 996203 (CONC); 996217 (CONC); 996387 (CONC. SGO); 996389 (CONC. SGO).  
 16. F *Baccharis rhomboidalis* J.Remy  
 994828 (CONC. SGO); 996202 (CONC); 996311 (CONC. SGO).  
 17. F *Baccharis salicifolia* (Ruiz et Pav.) Pers.  
 994930 (CONC. SGO).  
 18. H *Chaetanthera chilensis* (Willd.) DC.  
 20126 (CONC. SGO); 20139 (CONC. SGO); 994809 (CONC. SGO); 994820 (CONC. SGO); 996256  
 (CONC. SGO); 996290 (CONC. SGO); 996372 (CONC); 996425 (CONC. SGO).  
 19. H *Gamochaeta chamissonis* (DC) Cabrera  
 994838 (CONC); 996188 (CONC. SGO).  
 20. H *Gamochaeta spiciformis* (Sch.Bip.) Cabrera  
 20014 (CONC. SGO); 20092 (CONC. SGO).  
 21. S *Haplopappus paucidentatus* Phil.  
 20008 (CONC); 994804 (CONC); 994807 (CONC); 996168 (CONC. SGO); 996204 (CONC); 996284  
 (CONC. SGO); 996428 (CONC. SGO).  
 22. H *Hieracium glaucifolium* Poepp. ex Froel.  
 20045 (CONC); 20140 (CONC); 994805 (CONC. SGO); 994865 (CONC. SGO); 994971 (CONC);  
 996243 (CONC); 996398 (CONC).  
 23. H *Leucheria glacialis* (Poepp. ex Less.) Reiche  
 20163 (CONC).  
 24. H *Leucheria lithospermifolia* (Less.) Reiche  
 20088 (CONC. SGO); 996207 (CONC); 996242 (CONC. SGO); 996259 (CONC. SGO).  
 25. A *Madia sativa* Molina  
 996113 (CONC); 996184 (CONC).  
 26. F *Mutisia decurrens* Cav. var. *decurrens*  
 996159 (CONC); 996306 (CONC); 996386 (CONC. SGO).  
 27. F *Mutisia subulata* Ruiz et Pav. f. *subulata*  
 20174 (CONC).  
 28. H *Nassauvia aculeata* (Less.) Poepp. et Endl. var. *aculeata*  
 20171 (CONC. SGO); 996341 (CONC. SGO).  
 29. H *Perezia linearis* Less.  
 20165 (CONC); 996291 (CONC).  
 30. H *Perezia lyrata* (J.Remy) Wedd.  
 20167 (CONC); 996318 (CONC. SGO); 996414 (CONC. SGO).  
 31. H *Perezia nutans* Less.  
 994986 (CONC); 996412 (CONC).  
 32. S *Senecio angustissimus* Phil.  
 20119 (CONC. SGO); 20172 (CONC. SGO); 996028 (CONC); 996115 (CONC. SGO); 996392 (CONC.  
 SGO); 996420 (CONC).  
 33. S *Senecio chilensis* Less.  
 20048 (CONC. SGO); 20166 (CONC. SGO); 994833 (CONC); 994972 (CONC); 996020 (CONC);  
 996222 (CONC); 996307 (CONC).  
 34. H *Viguiera revoluta* (Meyen) S.F.Blake  
 20030 (CONC); 994834 (CONC); 994966 (CONC); 996351 (CONC. SGO).



**CONVOLVULACEAE**

35. H *Dichondra sericea* Sw. var. *sericea*  
994904 (CONC); 996010 (CONC, SGO); 996129 (CONC).

**CRUCIFERAE**

36. H *Cardamine glacialis* (G.Forst.) DC.  
994978 (CONC, SGO); 996369 (CONC).
37. H *Cardamine tenuirostris* Hook. et Arn.  
994979 (CONC); 996373 (CONC); 996411 (CONC, SGO).
38. H *Draba gilliesii* Hook. et Arn.  
20044 (CONC); 996241 (CONC, SGO); 996313 (CONC).

**CUSCUTACEAE**

39. A *Cuscuta chilensis* Ker-Gawl.  
20081 (CONC); 994907 (CONC); 996099 (CONC); 996357 (CONC, SGO).

**ELAEOCARPACEAE**

40. T *Aristolelia chilensis* (Molina) Stuntz  
20018 (CONC); 994859 (CONC); 996128 (CONC); 996133 (CONC).

**ERICACEAE**

41. F *Gaultheria phillyreifolia* (Pers.) Sleumer  
996019 (CONC); 996381 (CONC, SGO).
42. F *Gaultheria tenuifolia* (Phil.) Sleumer  
20029 (CONC, SGO); 20135 (CONC).

**ESCALLONIACEAE**

43. F *Escallonia alpina* Poepp. ex DC.  
994799 (CONC, SGO); 996349 (CONC, SGO).
44. FT *Escallonia myrtoidea* Bertero ex DC.  
994954 (CONC); 996266 (CONC, SGO).
45. F *Escallonia rubra* (Ruiz et Pav.) Pers. var. *rubra*  
994953 (CONC, SGO).

**EUPHORBIACEAE**

46. A *Euphorbia klotzschii* Oudejans  
996114 (CONC, SGO).
47. H *Euphorbia portulacoides* L. var. *portulacoides*  
20100 (CONC, SGO); 996359 (CONC, SGO).

**FAGACEAE**

48. T *Nothofagus obliqua* (Mirb.) Oerst. var. *obliqua*<sup>a</sup>  
996100 (CONC, SGO); 996132 (CONC, SGO); 996226 (CONC); 996232 (CONC, SGO); 996262 (CONC, SGO); 996377 (CONC).

**GUNNERACEAE**

49. H *Gunnera tinctoria* (Molina) Mirb.  
20028 (CONC); 996047 (CONC).

**HYDRANGEACEAE**

50. F *Hydrangea serratifolia* (Hook. et Arn.) F.Phil.  
994829 (CONC); 994963 (CONC); 996007 (CONC); 996350 (CONC).

**HYDROPHYLLACEAE**

51. H *Phacelia secunda* J.F.Gmel. var. *secunda*  
20080 (CONC); 20106 (CONC); 996237 (CONC); 996342 (CONC).

**LABIATAE**

52. AH *Stachys gilliesii* Benth.  
20031 (CONC); 20109 (CONC); 996016 (CONC); 996095 (CONC); 996143 (CONC); 996323 (CONC).

**LARDIZABALACEAE**

53. F *Lardizabala biternata* Ruiz et Pav.  
994949 (CONC); 996121 (CONC).

**LEDOCARPACEAE**

54. S *Wendtia gracilis* Meyen  
20032 (CONC); 20145 (CONC); 994835 (CONC); 994917 (CONC); 996180 (CONC).

**LOASACEAE**

55. A *Loasa tricolor* Ker-Gawl.  
994997 (CONC, SGO).

**LORANTHACEAE**

56. F *Tristerix corymbosus* (L.) Kuijt  
994825 (CONC, SGO); 996148 (CONC, SGO).

**MALVACEAE**

57. H *Malacothamnus chilensis* (Gay) Krapov.  
20063 (CONC, SGO).

**MISODENDRACEAE**

58. S *Misodendrum linearifolium* DC.  
994826 (CONC, SGO); 994880 (CONC, SGO).

**MYRTACEAE**

59. T *Anomyrtus luma* (Molina) D.Legrand et Kausel  
994957 (CONC).  
60. T *Luma apiculata* (DC.) Burret  
20002 (CONC, SGO); 994918 (CONC); 994938 (CONC, SGO).  
61. T *Myrcogenia ovata* (Hook. et Arn.) O.Berg var. *nannophylla* (Burret) Landrum  
20079 (CONC, SGO); 996379 (CONC).

**ONAGRACEAE**

62. H *Epilobium australe* Poepp. et Hausskn. ex Hausskn.  
20038 (CONC).  
63. H *Epilobium glaucum* Phil.  
20110 (CONC, SGO); 20168 (CONC).  
64. F *Fuchsia magellanica* Lam.  
20043 (CONC, SGO); 994806 (CONC); 994942 (CONC).

**OXALIDACEAE**

65. A *Oxalis micrantha* Bertero ex Colla  
996061 (CONC, SGO).  
66. H *Oxalis squamata* Zucc.  
20064 (CONC); 20161 (CONC); 994915 (CONC, SGO).

**PAPILIONACEAE**

67. H *Adesmia exilis* Clos  
996396 (CONC).  
68. H *Lathyrus multiceps* Clos  
994843 (CONC); 996332 (CONC); 996406 (CONC).  
69. H *Vicia nigricans* Hook. et Arn.  
20041 (CONC); 994841 (CONC); 994864 (CONC); 996260 (CONC); 996388 (CONC).

**PLANTAGINACEAE**

70. H *Plantago grandiflora* Meyen  
996310 (CONC, SGO).

**PLUMBAGINACEAE**

71. H *Armeria maritima* (Mill.) Willd.  
20124 (CONC); 996309 (CONC); 996421 (CONC).

**POLEMONIACEAE**

72. A *Microsteris gracilis* (Hook.) Greene  
994968 (CONC).

**POLYGONACEAE**

73. F *Muehlenbeckia hastulata* (Sm.) I.M.Johnst. var. *fascicularis* (Meisn.) Brandbyge  
994882 (CONC); 994952 (CONC, SGO); 996105 (CONC); 996354 (CONC, SGO).  
74. F *Muehlenbeckia hastulata* (Sm.) I.M.Johnst. var. *hastulata*  
20152 (CONC).

**PORTULACACEAE**

75. H *Montiopsis andicola* (Gillies ex Hook. et Arn.) D.I.Ford  
20123 (CONC).  
76. H *Montiopsis gayana* (Barnéoud) D.I.Ford  
20122 (CONC); 994896 (CONC); 996017 (CONC); 996427 (CONC).  
77. H *Montiopsis umbellata* (Ruiz et Pav.) D.I.Ford  
996029 (CONC).

**PROTEACEAE**

78. T *Lomatia dentata* (Ruiz et Pav.) R.Br.  
994856 (CONC); 994868 (CONC); 996161 (CONC); 996283 (CONC); 996383 (CONC).  
79. T *Lomatia hirsuta* (Lam.) Diels ex J.F.Macbr.  
20071 (CONC); 994821 (CONC); 996385 (CONC).  
80. F *Orites myrtoidea* (Poepp. et Endl.) Benth. et Hook.f. ex B.D.Jacks.  
996424 (CONC, SGO).

**RHAMNACEAE**

81. F *Colletia hystrix* Clos  
994877 (CONC, SGO); 994947 (CONC, SGO); 996329 (CONC).

**ROSACEAE**

82. H *Acaena ovalifolia* Ruiz et Pav.  
20034 (CONC, SGO).  
83. H *Acaena pinnatifida* Ruiz et Pav.  
994873 (CONC).  
84. H *Geum quellyon* Sweet  
20112 (CONC).  
85. S *Margyricarpus pinnatus* (Lam.) Kuntze  
996191 (CONC); 996362 (CONC).  
86. F *Tetraglochin alatum* (Gillies ex Hook. et Arn.) Kuntze  
996346 (CONC).

**RUBIACEAE**

87. H *Galium eriocarpum* Bartl. ex DC.  
20146 (CONC); 20149 (CONC); 20157 (CONC); 996314 (CONC, SGO); 996338 (CONC); 9963<sup>3</sup> (CONC).  
88. H *Galium hypocarpium* (L.) Endl. ex Griseb. subsp. *hypocarpium*  
994894 (CONC); 994928 (CONC); 996097 (CONC); 996147 (CONC).  
89. S *Galium suffruticosum* Hook. et Arn.  
994989 (CONC, SGO); 996289 (CONC, SGO); 996418 (CONC); 996422 (CONC).  
90. H *Hedyotis salzmännii* (DC.) Steud.  
996059 (CONC).

**SANTALACEAE**

91. F *Myoschilos oblongum* Ruiz et Pav.  
994982 (CONC); 996102 (CONC, SGO); 996122 (CONC, SGO); 996205 (CONC, SGO); 996216 (CONC, SGO).  
92. H *Quinchamalium chilense* Molina  
20056 (CONC); 20093 (CONC, SGO); 994800 (CONC); 996176 (CONC, SGO); 996288 (CONC, SGO).

**SAXIFRAGACEAE**

93. F *Ribes punctatum* Ruiz et Pav.  
20085 (CONC, SGO); 994814 (CONC); 994850 (CONC); 996003 (CONC, SGO); 996136 (CONC); 996384 (CONC).

94. H *Saxifraga magellanica* Poir.  
20076 (CONC, SGO); 20150 (CONC); 20177 (CONC, SGO); 996196 (CONC); 996324 (CONC, SGO).

SCROPHULARIACEAE

95. SF *Calceolaria dentata* Ruiz et Pav.  
20113 (CONC, SGO); 20180 (CONC, SGO).
96. H *Calceolaria foliosa* Phil.  
20084 (CONC).
97. H *Calceolaria williamsii* Phil.  
996026 (CONC); 996206 (CONC).
98. A *Mimulus glaberratus* Kunth  
996046 (CONC).
99. H *Ourisia alpina* Poepp. et Endl.  
20151 (CONC); 20156 (CONC).
100. S *Ourisia microphylla* Poepp. et Endl.  
20144 (CONC, SGO); 20162 (CONC, SGO); 996344 (CONC, SGO).
101. H *Ourisia poeppigii* Benth.  
20069 (CONC, SGO); 20077 (CONC).

SOLANACEAE

102. F *Fabiana imbricata* Ruiz et Pav.  
996021 (CONC); 996304 (CONC).
103. H *Salpiglossis sinuata* Ruiz et Pav.  
20055 (CONC); 994913 (CONC); 996339 (CONC); 996360 (CONC).
104. AB *Schizanthus hookeri* Gillies ex Graham  
20054 (CONC); 996012 (CONC); 996027 (CONC); 996366 (CONC).
105. F *Solanum ligustrinum* Lodd.  
20060 (CONC, SGO).

TROPAEOLACEAE

106. H *Tropaeolum leptophyllum* G. Don  
996337 (CONC, SGO).

UMBELLIFERAE

107. H *Apium chilense* Hook. et Arn.  
20020 (CONC).
108. A *Bowlesia incana* Ruiz et Pav.  
996052 (CONC).
109. H *Bowlesia tropaeolifolia* Gillies et Hook.  
20057 (CONC); 20173 (CONC); 996277 (CONC).
110. AH *Daucus montanus* Humb. et Bonpl. ex Spreng.  
996268 (CONC).
111. H *Eryngium paniculatum* Cav. et Dombey ex F. Delaroché  
994852 (CONC); 996212 (CONC, SGO); 996267 (CONC, SGO).
112. H *Osmorhiza berteroi* DC.  
20083 (CONC, SGO); 994887 (CONC); 994940 (CONC); 996001 (CONC, SGO); 996153 (CONC).
113. H *Sanicula graveolens* Poepp. ex DC.  
996276 (CONC); 996296 (CONC).

VALERIANACEAE

114. H *Valeriana hebecarpa* DC.  
20013 (CONC, SGO); 996187 (CONC, SGO); 996312 (CONC, SGO).
115. H *Valeriana leucocarpa* DC.  
20073 (CONC).

VERBENACEAE

116. F *Diostea juncea* (Gillies et Hook.) Miers  
994889 (CONC); 996280 (CONC, SGO); 996340 (CONC, SGO).
117. S *Verbena ribifolia* Walp.  
20154 (CONC, SGO).

**VIOLACEAE**

118. H *Viola reichei* Skottsbo.  
994870 (CONC, SGO); 996253 (CONC, SGO); 996273 (CONC, SGO).

**VIVIANIACEAE**

119. F *Viviania ovata* Phil.  
20040 (CONC, SGO); 994803 (CONC); 996244 (CONC, SGO); 996316 (CONC, SGO).

**WINTERACEAE**

120. T *Drimys winteri* J.R.Forst. et G.Forst.  
994919 (CONC); 996013 (CONC).

**MONOCOTYLEDONEAE**

**ALSTROEMERIACEAE**

1. H *Alstroemeria aurea* Graham  
20025 (CONC, SGO); 20095 (CONC); 996399 (CONC).

**AMARYLLIDACEAE**

2. H *Rhodophiala araucana* (Phil.) Traub  
20160 (CONC); 996025 (CONC, SGO); 996210 (CONC); 996325 (CONC, SGO).

**BROMELIACEAE**

3. H *Puya alpestris* (Poepp.) Gay<sup>b</sup>  
996022 (CONC, SGO)

**CYPERACEAE**

4. H *Carex aphylla* Kunth  
20128 (CONC, SGO); 994836 (CONC, SGO); 994976 (CONC, SGO); 996170 (CONC, SGO); 996327 (CONC, SGO); 996408 (CONC).
5. H *Carex banksii* Boott  
20012 (CONC, SGO); 20101 (CONC); 20104 (CONC, SGO).
6. H *Carex lateriflora* Phil.  
994992 (CONC, SGO).
7. H *Carex setifolia* Kunze ex Kunth  
20051 (CONC, SGO); 20158 (CONC).
8. H *Uncinia phleoides* (Cav.) Pers.  
20148 (CONC, SGO).

**DIOSCOREACEAE**

9. H *Dioscorea* sp.  
996177 (CONC).
10. H *Dioscorea reticulata* Gay  
994867 (CONC, SGO); 996144 (CONC, SGO); 996382 (CONC, SGO).

**GRAMINEAE**

11. H *Agrostis inconspicua* Kunze ex E.Desv.  
996041 (CONC); 996154 (CONC, SGO).
12. A *Bromus berterianus* Colla  
996069 (CONC, SGO).
13. H *Bromus tunicatus* Phil.  
20066 (CONC).
14. H *Chascolytrum subaristatum* (Lam.) Desv.  
994990 (CONC).
15. F *Chusquea culeou* E.Desv.  
20005 (CONC, SGO); 20131 (CONC, SGO); 994827 (CONC, SGO); 996317 (CONC, SGO).
16. H *Elymus angulatus* J.Presl  
996361 (CONC, SGO).



17. H *Festuca acanthophylla* E.Desv.  
996173 (CONC, SGO); 996198 (CONC); 996285 (CONC, SGO); 996287-A (CONC, SGO); 996319 (CONC, SGO); 996336 (CONC).
18. H *Festuca thermanum* Phil.  
20016 (CONC); 994858 (CONC); 994974 (CONC, SGO); 996286 (CONC); 996287-B (CONC, SGO); 996407 (CONC); 996409 (CONC, SGO).
19. H *Koeleria* sp.  
996023 (CONC); 996171 (CONC); 996297 (CONC, SGO); 996302 (CONC, SGO); 996326 (CONC); 996395 (CONC).
20. H *Nassella chilensis* (Trin.) E.Desv.  
996172 (CONC).
21. H *Nassella gigantea* (Steud.) M.Muñoz  
994893 (CONC, SGO).
22. H *Piptochaetium montevidense* (Spreng.) Parodi  
994895 (CONC).
23. H *Piptochaetium panicoides* (Lam.) E.Desv.  
994933 (CONC); 994934 (CONC).
24. H *Poa* sp.  
20027 (CONC)
25. H *Polypogon australis* Brongn.  
996048 (CONC); 996067 (CONC, SGO).
26. H *Relchela panicoides* Steud.  
994860 (CONC); 994863 (CONC); 994881 (CONC, SGO); 994987 (CONC, SGO); 996156 (CONC).
27. H *Ryidosperma violaceum* (E.Desv.) Nicora  
20117 (CONC, SGO); 20033 (CONC, SGO).
28. H *Trisetum cumingii* (Nees ex Steud.) Parodi ex Nicora var. *cumingii*  
20015 (CONC, SGO); 20037 (CONC); 20121 (CONC, SGO); 996015 (CONC); 996034 (CONC, SGO); 996155 (CONC).
29. H *Trisetum lechleri* (Steud.) Nicora  
996367 (CONC).

#### IRIDACEAE

30. H *Olsynium junceum* (E.Mey. ex K.Presl) Goldblatt  
20176 (CONC); 994980 (CONC); 996233 (CONC); 996413 (CONC, SGO).
31. H *Olsynium scirpoideum* (Poepp.) Goldblatt  
994855 (CONC).
32. H *Sisyrinchium arenarium* Poepp.  
20111 (CONC, SGO); 20143 (CONC, SGO); 20170 (CONC); 996208 (CONC, SGO); 996252 (CONC); 996299 (CONC); 996335 (CONC, SGO).
33. H *Solenomelus segethii* (Phil.) Kuntze  
996331 (CONC); 996403 (CONC, SGO).

#### JUNCACEAE

34. A *Juncus bufonius* L.  
996066 (CONC).
35. H *Juncus cyperoides* Laharpe  
996050 (CONC, SGO); 996055 (CONC).
36. H *Juncus stipulatus* Nees et Meyen  
20118 (CONC, SGO).
37. H *Juncus tenuis* Willd.  
996063 (CONC).
38. H *Luzula racemosa* Desv.  
20107 (CONC); 996033 (CONC); 996200 (CONC, SGO); 996255 (CONC); 996301 (CONC, SGO); 996371 (CONC).

#### ORCHIDACEAE

39. H *Gavilea araucana* (Phil.) M.N.Corraea  
994945 (CONC, SGO).
40. H *Gavilea glandulifera* (Poepp.) M.N.Corraea  
20175 (CONC, SGO); 994981 (CONC); 996246 (CONC).

<sup>a</sup> The following collections are possibly hybrids between *Nothofagus obliqua* and *N. glauca*: 20010 (CONC, SGO); 996126 (CONC, SGO). Further study might warrant placing these specimens in *Nothofagus leonii* Espinosa, considered by Donoso & Landrum (1976) to be a hybrid between the two species mentioned.

<sup>b</sup> Taxonomy for *Puya* follows Trumpler (1998).

TABLE 6. Exotic flora of the Bellotos del Melado National Reserve, Region VII, Chile. A: Annual; B: Biennial herb; H: Perennial herb; F: Shrub. All cited collection numbers are those of Arroyo *et al.*

TABLE 6. Flora adventicia de la Reserva Nacional Bellotos del Melado, VII Región, Chile. A: Hierba anual; B: Hierba bienal; H: Hierba perenne; F: Arbusto. Las muestras de herbario citadas son de Arroyo *et al.*

## DICOTYLEDONEAE

### BORAGINACEAE

1. B *Cynoglossum creticum* Mill.  
20068 (CONC).
2. B *Echium vulgare* L.  
996127 (CONC); 996080 (CONC, SGO); 996239 (CONC).

### CARYOPHYLLACEAE

3. H *Cerastium arvense* L.  
20021 (CONC); 994816 (CONC); 994970 (CONC); 996294 (CONC); 996391 (CONC).
4. A *Petrorhagia dubia* (Raf.) G.López et Romo  
996270 (CONC).
5. H *Saponaria officinalis* L.  
994922 (CONC); 996265 (CONC, SGO).
6. A *Scleranthus annuus* L.  
996008 (CONC); 996104 (CONC, SGO).
7. A *Stellaria media* (L.) Cirillo  
994956 (CONC); 996368 (CONC).

### COMPOSITAE

8. A *Anthemis cotula* L.  
996103 (CONC).
9. A *Cirsium vulgare* (Savi) Ten.  
20115 (CONC); 996108 (CONC).
10. A *Crepis capillaris* (L.) Wallr.  
996086 (CONC, SGO); 996111 (CONC).
11. H *Hypochaeris radicata* L.  
996042 (CONC); 996045 (CONC); 996111-A (CONC).
12. AB *Lactuca virosa* L.  
20059 (CONC, SGO); 994875 (CONC).
13. H *Leucanthemum vulgare* Lam.  
994892 (CONC); 996094 (CONC, SGO).
14. H *Tanacetum parthenium* (L.) Sch.Bip.  
994914 (CONC, SGO).

### GERANIACEAE

15. A *Geranium molle* L.  
20087 (CONC, SGO); 994837 (CONC); 994925 (CONC, SGO); 996051 (CONC).

### GUTTIFERAE

16. H *Hypericum perforatum* L.  
20035 (CONC); 996271 (CONC, SGO).

### LABIATAE

17. H *Marrubium vulgare* L.  
996107 (CONC).

18. H *Prunella vulgaris* L.  
996053 (CONC, SGO); 996057 (CONC); 996075 (CONC, SGO).

LYTHRACEAE

19. A *Lythrum hyssopifolium* L.  
994890 (CONC).

PAPILIONACEAE

20. H *Lotus uliginosus* Schkuhr  
994920 (CONC, SGO).  
21. A *Trifolium dubium* Sibth.  
996071 (CONC); 996091-A (CONC).  
22. A *Trifolium glomeratum* L.  
996072 (CONC, SGO); 996085 (CONC); 996091-B (CONC).  
23. H *Trifolium repens* L.  
996263 (CONC).

PLANTAGINACEAE

24. H *Plantago lanceolata* L.  
20129 (CONC, SGO); 994878 (CONC, SGO).

POLYGONACEAE

25. H *Rumex acetosella* L.  
20091 (CONC); 994840 (CONC).

ROSACEAE

26. F *Rosa canina* L.  
994839 (CONC).  
27. F *Rubus ulmifolius* Schott  
994931 (CONC, SGO).

RUBIACEAE

28. A *Galium aparine* L.  
996146 (CONC).  
29. A *Sherardia arvensis* L.  
996073 (CONC, SGO); 996090 (CONC).

SCROPHULARIACEAE

30. B *Verbascum thapsus* L.  
20065 (CONC); 996082 (CONC); 996123 (CONC).  
31. B *Verbascum virgatum* Stokes  
996245 (CONC).  
32. AH *Veronica anagallis-aquatica* L.  
994926 (CONC).  
33. H *Veronica serpyllifolia* L.  
996060 (CONC); 996077-A (CONC).

SOLANACEAE

34. A *Solanum nigrum* L.  
994923 (CONC, SGO); 996118 (CONC).

UMBELLIFERAE

35. AB *Conium maculatum* L.  
996106 (CONC).

MONOCOTYLEDONEAE

GRAMINEAE

1. H *Agrostis capillaris* L.  
20047 (CONC, SGO).

2. A *Aira caryophylla* L.  
994861 (CONC); 994898-A (CONC); 996174 (CONC); 996375 (CONC).
3. A *Avena sativa* L.  
996009 (CONC).
4. A *Briza minor* L.  
996077 (CONC, SGO).
5. A *Bromus hordeaceus* L.  
994898 (CONC); 994899 (CONC); 996068 (CONC); 996087 (CONC, SGO); 996109 (CONC).
6. A *Cynosurus echinatus* L.  
20075 (CONC); 994935 (CONC, SGO); 996078 (CONC, SGO); 996194 (CONC, SGO).
7. H *Dactylis glomerata* L.  
996037 (CONC).
8. H *Hordeum murinum* L.  
996112 (CONC).
9. H *Lolium perenne* L.  
996065 (CONC).
10. A *Vulpia bromoides* (L.) Gray  
996062 (CONC).
11. A *Vulpia myuros* (L.) C.C.Gmel. var. *myuros*  
994853 (CONC); 996018 (CONC, SGO); 996031 (CONC, SGO); 996036 (CONC).

TABLE 7. Additional species not found in the reserve, collected close to CONAF headquarters, Bellotos del Melado National Reserve, Region VII, Chile. A: Annual; H: Perennial herb. All cited collection numbers are those of Arroyo *et al.* N = Native, non-endemic; A = Adventive (exotic); O = Origin; FV = Life form.

TABLA 7. Taxas adicionales no encontrados en la reserva, coleccionados en la vecindad de las dependencias de CONAF, Reserva Nacional Bellotos del Melado, VII Región, Chile. A: Hierba anual; H: Hierba perenne. Las muestras de herbario citadas son de Arroyo *et al.* N = Nativo, no-endémico; A = Adventicia (exótico); O = Origen; FV = Forma de vida.

|    | O | FV |  |
|----|---|----|--|
| 1. | N | H  | <i>Agrostis meyenii</i> Trin. (GRAMINEAE)<br>996084 (CONC).                                  |
| 2. | A | A  | <i>Arenaria serpyllifolia</i> L. (CARYOPHYLLACEAE)<br>996093 (CONC).                         |
| 3. | N | A  | <i>Bromus cebadilla</i> Steud. (GRAMINEAE)<br>996089 (CONC).                                 |
| 4. | N | A  | <i>Hydrocotyle indecora</i> DC. (UMBELLIFERAE)<br>996079 (CONC).                             |
| 5. | A | H  | <i>Modiola caroliniana</i> (L.) G. Don (MALVACEAE)<br>996088 (CONC).                         |
| 6. | N | A  | <i>Oenothera stricta</i> Ledeb. ex Link subsp. <i>stricta</i> (ONAGRACEAE)<br>996083 (CONC). |
| 7. | N | A  | <i>Oxalis valdiviensis</i> Barnéoud (OXALIDACEAE)<br>996098 (CONC).                          |
| 8. | N | H  | <i>Nierembergia repens</i> Ruiz et Pav. (SOLANACEAE)<br>996099-A (CONC).                     |

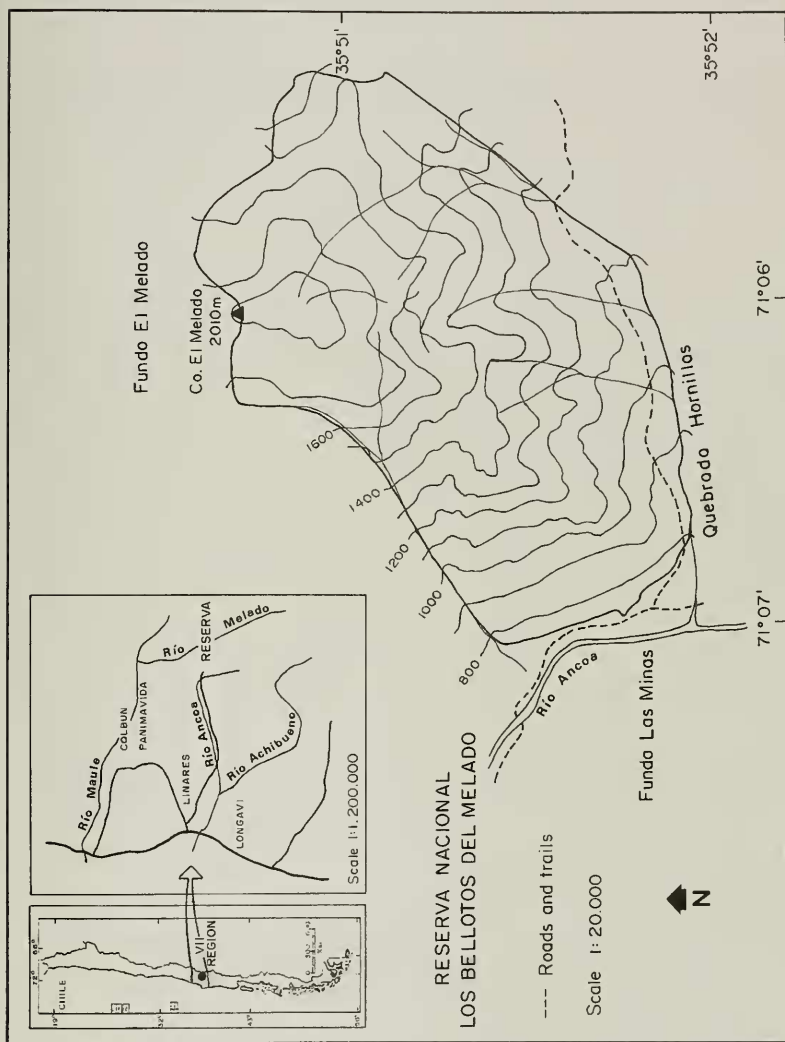


FIGURE 1. Location of the Bellotos del Melado National Reserve, Region VII, Chile.

FIGURA 1. Ubicación de la Reserva Bellotos del Melado, VII Región, Chile.