The Rufford Foundation
Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Gisela Stotz
Project title	Biological richness of Lomas communities: potential consequences of aridity on these highly diverse and endangered ecosystems
RSG reference	23061-1
Reporting period	2017-2018
Amount of grant	£4950
Your email address	stotzgisela@gmail.com
Date of this report	November, 2018

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Plant community survey			X	Done as planned.
Site environmental conditions		X		Spot in-site moisture measurements were deemed not representative, due to the high daily variation. To get a better estimate, we decided to install fog collectors. Further, I have partnered with a remote-sensing specialist who is helping us gather more accurate climatic data on air relative humidity and fog prevalence over time (still underway).
Functional trait measurements		X		Most functional measurements were done as planned, except for chlorophyll content and chlorophyll fluorescence (see below).
Community analyses		X		Analyses are still preliminary as some plant species identification is still being confirmed.
Functional trait analyses			X	Done as planned
Outreach		X		Still underway. Some activities have been done or coordinated. Once all data is processed and results are final, they will be presented at ecological conferences, will be published in scientific journals, and will be shared as reports and presentations to local authorities and the community.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

We experienced three main difficulties.

The first one was time, as the season was very short, and the plants flowered and started to dry out faster than expected. Considering this, plus the time it took per site to do the community and trait sampling, we were only able to sample six of the seven sites initially proposed.

The second difficulty has been identifying plants to species. The diverse nature of these plant communities and the temporary closure of the University of La Serena Herbarium due to renovations have made identifying the species a difficult task. Thus identifying species has taken longer than previously thought, which has delayed the final data analyses. Professor Gina Arancio, curator of the herbarium has been kind enough to get involved and help in this process, so we don't foresee this taking too much longer.

Third, we experienced some technical difficulties in measuring certain functional traits. Chlorophyll content and chlorophyll fluorescence could not be measured. We were unable to get a reliable measure with either sensor (chlorophylometer and fluorometer), as they can only measure in medium to large size, entire leaves, while most species sampled have very small, frequently non-entire leaves,

3. Briefly describe the three most important outcomes of your project.

We have identified so far a total of 158 species found across the six *Lomas* communities (**Suppl. Table 1**). Of the species found, 92 species are endemic and 13 are vulnerable or endangered (**Suppl. Table 1**). Baseline information on species composition, abundance and functional variation at each site are key to monitor the changes over time (see below).

<u>Community analyses</u>
When looking at diversity trends across sites, we found abundance, total and native species richness to decrease towards the north (**Fig. 1A, B, and C**). Lower species richness in northern sites, such as Paposo and Taltal is likely explained by their isolation, as they are surrounded by a hyper-arid habitat, where only few plant species (mostly cacti) can be found. Southern communities such as El Tofo and Carrizal Bajo are instead surrounded by seasonally active vegetation, dominated by shrubs, perennial forbs and the sporadic appearance of annual species. Interestingly, the proportion of endemic species across the six communities remains rather consistent, being slightly lower in the southernmost site of El Tofo (**Table 2**).

We found these communities to not be taxonomically redundant. Community composition was significantly different across sites (F = 12.56, P = 0.001, **Fig. 2A**). Although all sites shared at least some species (**Suppl. Table 1**), there was a high species turnover across sites (**Fig. 2A**). The only species present in all six sites was *Plantago hispidula* (**Suppl. Table 1**). The fact that each site hosts a different set of species highlights the need to preserve several of these communities, to prevent biodiversity loss. Currently, only two *Lomas* in Chile are located within protected areas in the national parks Llanos de Challe and Pan de Azúcar.

The number of unique species (those not present in any of the other *Lomas* communities studied in this project) was found to decrease towards the north (**Fig. 3**), indicating that a greater number of species are unable to colonise or persist in the more arid and isolated *Lomas* communities towards the north. In contrast, in southern sites (El Tofo, Carrizal Bajo) half or over half of the species in the site are not found in any of the other studied *Lomas* (**Fig. 3**). Overall, these results may suggest that an increase in aridity and isolation may lead to species loss, especially of unique species.

We also found the southern, less isolated *Lomas* to be more homogeneous in terms of the species composition (lower species turnover within each site as evidenced by the lower beta-dispersion, **Fig. 2B**). This indicates that species in the northern sites are not only generally less abundant within the site, but also have a more patchy distribution, which may put the species in these sites at greater risk of local extinction. Species lower abundance and greater patchiness in northern (more arid), compared to the southern sites may be partly due to the greater community dependence on fog versus rain. Southern sites, El Tofo and Carrizal Bajo, both tend to receive more rain, in contrast to more northern sites where rain is rare, and the communities are therefore more dependent on fog for their water supply. Fog may create greater heterogeneity within site, being more prevalent in the upper parts of the *Lomas*. For example, in Taltal there are great differences between the lower and upper parts of the *Loma*, with tall growing shrubs such as *Euphorbia lactiflua*, *Balbisia peduncularis* and *Polyachurus fuscus* dominating the higher areas of the Loma, while herbs and annuals dominating the lower areas. Less variation along the altitudinal gradient was observed in sites such as El Tofo and Carrizal Bajo.

Functional trait analyses

In spite of the variation in species richness and, especially, in species composition found across sites (see above) we did not find strong differences in terms of the functional groups or the functional strategies of the dominant species (**Fig. 4**). The only site that showed some slight differences was Paposo, the northernmost site, where stress tolerance was slightly lower (F = 5.07, P < 0.001) and the ruderal strategy was slightly higher (F = 7.02, P < 0.001).

In general, species showing competitor traits were virtually absent from these communities (**Fig. 4A**), which indicates that competition is not an important force shaping these communities, not even in the less isolated, more productive southern *Lomas* of El Tofo and Carrizal Bajo. Abiotic stress appears to be the main factor structuring these communities, which can be coped with through two strategies: ruderality or stress tolerance. The ruderal strategy is associated with a low investment into defence and maintenance of vegetative tissue, and a high investment into the production of propagules. Stress tolerators instead tend to invest in their capacity to prevent resource loss and hence tend to be capable of maintaining a more or less constant performance in variable and/or resource-poor environments.

When evaluating particular traits, some differences were observed across sites, but rather small ones. Under increasing aridity, plants may benefit from having smaller specific leaf area (SLA) and higher leaf water content (LWC), among others, but it appears that conditions across these fog-dependent ecosystems did not vary greatly, as no strong differences in plant functional traits were observed across sites. For example some differences were observed in SLA and LWC (SLA: F =11.33, P < 0.0001; LWC: F = 3.37, P =0.005) across site. However, these differences were mainly driven by slightly higher SLA and lower LWC in the southern-most site of El Tofo (**Fig. 5**).

On the other hand, low gene flow due to isolation can limit the arrival or new, potentially adaptive genotypes and limit genetic variation within the population. However, we found that neither isolation nor aridity have eroded the functional variation of species in the studied communities. We found that the variation in functional strategies (Stress tolerance: $F = 0.734$, $P = 0.6$; Ruderality: $F = 0.355$, $P = 0.88$) and key functional traits (SLA: $F = 1.99$, $P = 0.09$; LWC: $F = 0.75$, $P = 0.59$) remained high across sites, and did not increase with isolation or aridity, towards the more northern sites (**Fig. 6**). Variation in fog incidence within each site along the altitudinal gradient creates a moisture gradient that may be helping in preserving high variation in relevant functional traits. This variation could facilitate the persistence of these populations under changing climatic conditions. It remains to be determined whether the variation observed is genetic or comes from phenotypic plasticity (the ability of genotypes to express different phenotypes in response to environmental conditions).

Overall, our results suggest that the differences observed in species richness and composition across sites are mainly driven by isolation, which limits the arrival of species to the more northern sites. Abiotic conditions, such as aridity, on the other hand, do not seem to be responsible for filtering out certain species or functional groups, as our analyses show that similar functional strategies are selected for/successful across the six studied Lomas. Hence, although the increasing aridity towards northern sites greatly limits the establishment and persistence of species outside the *Lomas*, it does not seem to do so within these ecosystems. This further highlights the importance of these ecosystems as a refuge for species in the hyper-arid Atacama Desert.

<u>Prevalence and potential threats by alien species</u>
An unexpected result was the prevalence of alien species in three of the six *Lomas* communities studied. Around a fifth of the species found at both extremes of the latitudinal gradient were found to be alien species (not native to Chile) (In El Tofo 16 out of 77 species are alien, and in Paposo, six of 34). That the northern communities had a high number of alien species was a rather surprising result considering that propagules pressure is likely to be low due to their general isolation and being at a considerable distance from alien seed sources. However, disturbances and human activities are important drivers of invasion. The three communities where alien species were prevalent (El Tofo, Taltal and Paposo) have roads going through them which by itself is an important disturbance, and it makes these communities more accessible for human activities.

Further assessments and monitoring of alien species behaviour is needed due to their potential impact on these ecosystems. Alien species can have devastating consequences, as they can alter ecosystem functions and exclude native species from the areas they invade. Many of the alien species found in our survey are known to change ecosystem processes, such as *Mesembryanthemum crystallinum* and *M. nodiflorum*, which tend to increase soil salinity. Further, although there are few studies that have evaluated alien species impact in Chile, many of the alien species found in these communities are known to be invasive (abundant and to cause an impact on native species) elsewhere, such as *Atriplex semibaccata, Erodium cicutarium, E. moschatum, Galium aparine, Herniaria cinerea, Lamarkia aurea, Medicago polymorpha, Mesembryanthemum crystallinum, M. nodiflorum, Rostraria cristata, Sisymbrium irio* and *Torilis nodosa* (Fuentes et al. 2013) (**Suppl. table 1**).

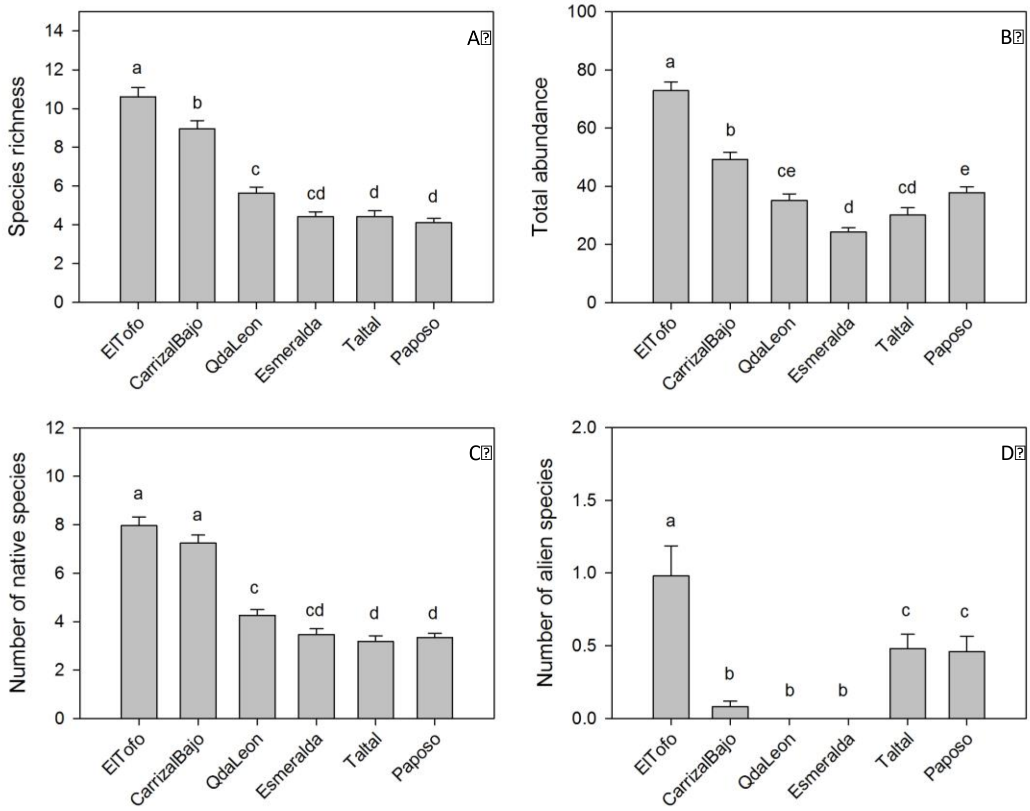

Fig. 1: Average (A) species richness, (B) total abundance, (C) number of native species and (D) number of alien species per plot across the six *Lomas* communities sampled. Sites are ordered according to location, from south to north.

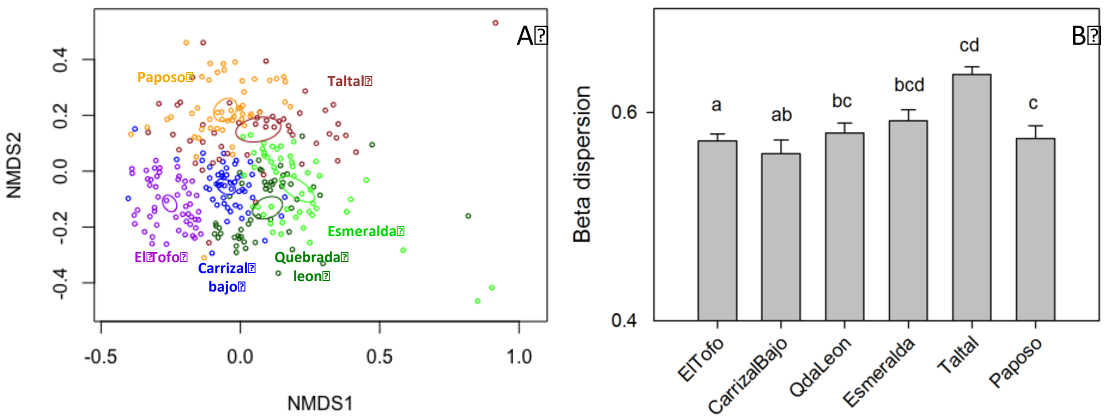

Fig. 2: (A) Non-metric multidimensional scaling analyses of species composition across 6 *Lomas* communities, (B) homogenization (species turnover), measured as beta-dispersion. Sites are ordered according to location, from south to north.

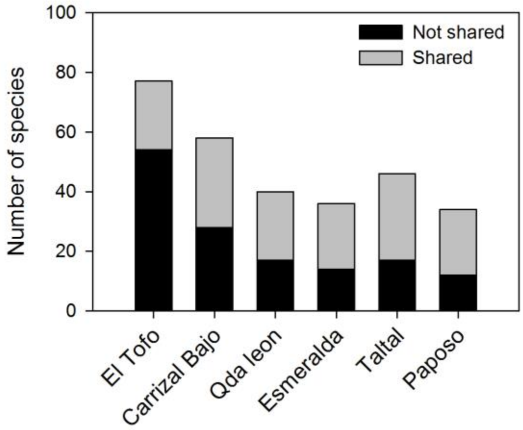

Fig. 3: Number of shared species (present in at least one other of the studied communities) and not shared species (not present in any of the other studied communities). Sites are ordered according to location, from south to north.

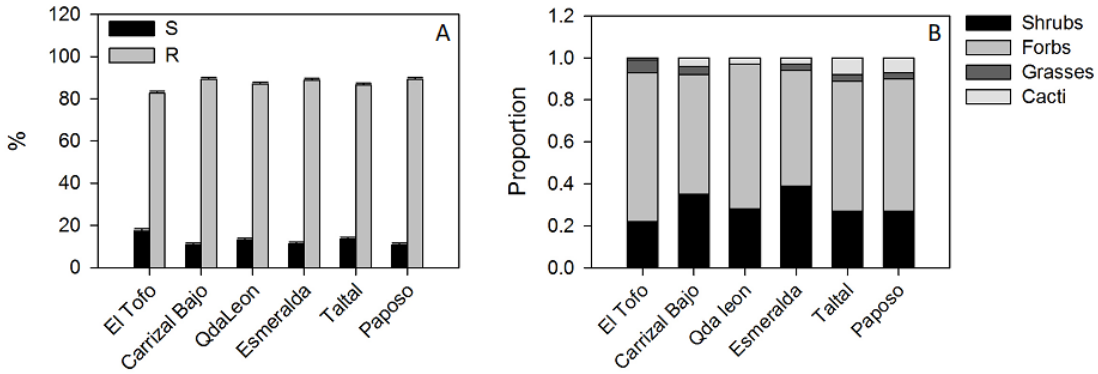

Fig. 4: (A) Plant functional strategies and (B) plant functional groups. Functional strategies were defined based on the competitor, stress-tolerator, ruderal (CSR) theory, following the methods developed by Pierce et al. (2017). Individual's strategies were defined based on their leaf area, leaf dry matter content and specific leaf area following Pierce et al. (2017). Strategies were calculated for each individual as a % of affiliation with a particular strategy, averaged per species, and compared across sites. S stands for stress-tolerator and R for ruderal. Sites are ordered according to location, from south to north.

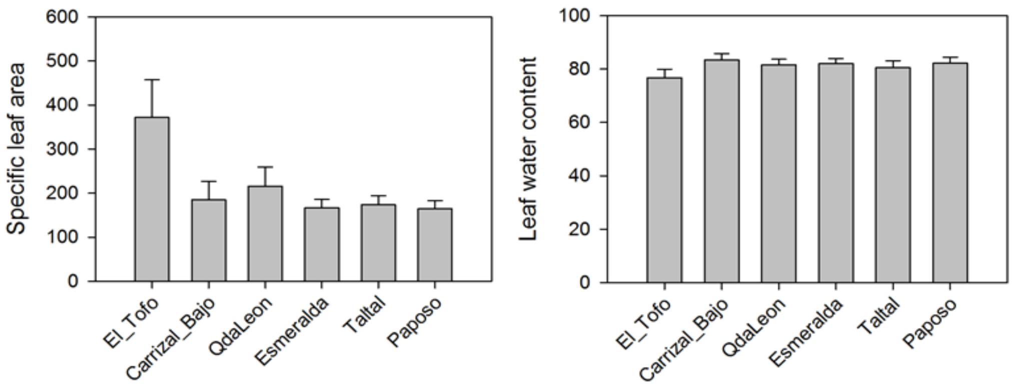

Fig. 5: Specific leaf area (SLA, cm^2 g^{-1}) and leaf water content (LWC, %) of the sampled species across sites. Sites are ordered according to location, from south to north.

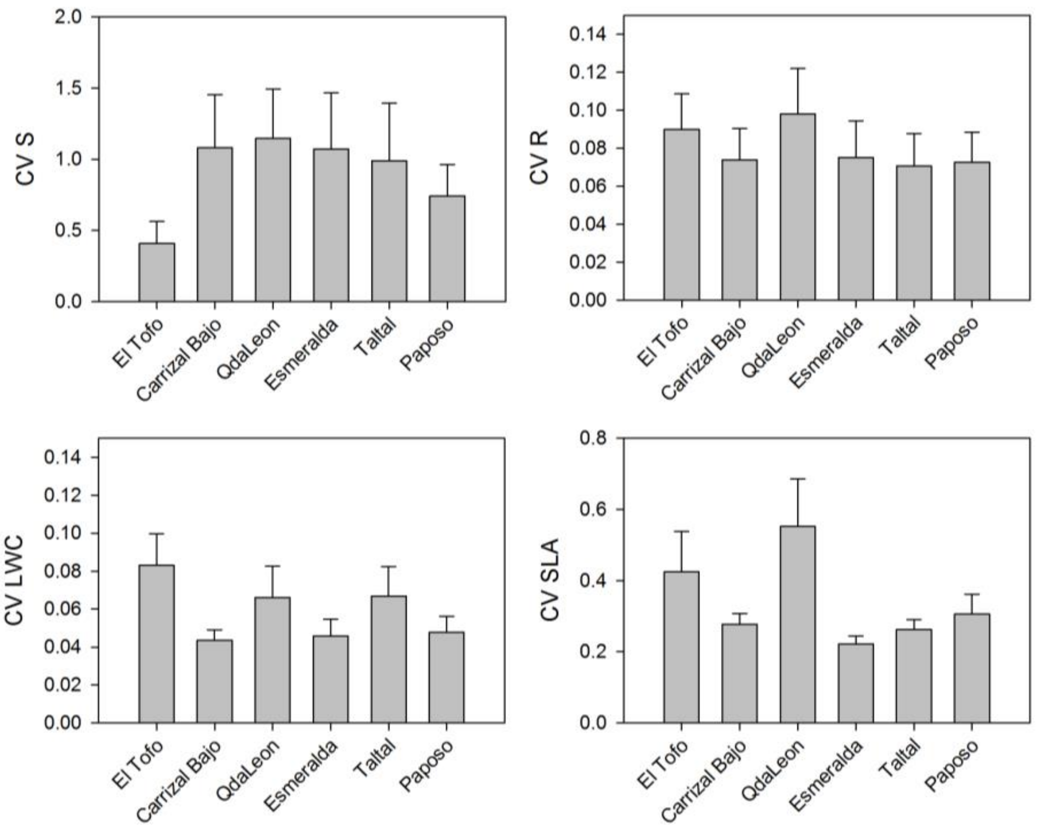

Fig. 6: Coefficient of variation in stress-tolerance, ruderality, leaf water content (LWC) and specific leaf area (SLA) across sites. Sites are ordered according to location, from south to north.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Activities with local communities are still underway and being organised.

We started activities with a local school in La Serena, teaching them about the importance of science and nature conservation, emphasising the diversity and uniqueness of the region's flora. The kids are 10 to 15-year olds were highly interested in the subject, and engaged in the activities. Similar activities with other schools are being organised.

Moreover, although working with kids is highly rewarding, we are planning on also organising workshops to teach and engage teachers, which can make a greater difference in the long-term, as they will train and influence many generations to come.

Lastly, in contact with CONAF and CEAZA, we will also try to engage local communities to raise awareness about the existence and importance of these ecosystems. We are currently organising data and preparing visual material to share.

5. Are there any plans to continue this work?

Yes. We plan on continue monitoring these communities taking advantage of the baseline information on community composition and functional variation gathered, and the permanent plots that were established in the framework of this project.

Further, I was able to secure some extra funding to continue research on how the species in these isolated communities will cope with climate change. In the framework of this FONDECYT-funded project, I will continue studying the genetic and functional differentiation among populations of key species in these communities, determine the mechanisms by which species may adapt toc changing conditions (i.e., phenotypic plasticity and/or genetic differentiation) and evaluate the conditions that drive ecological and/or evolutionary responses to aridity.

6. How do you plan to share the results of your work with others?

Results will be shared in a variety of forms.

We have been in contact with CONAF (National Forest Corporation, the institution in charge national parks). We have started a monitoring programme of fog and the plant communities in the *Lomas* found within two national parks (Llanos de Challe and Pan de Azucar), and we are already committed to the organisation of workshops at both national parks to inform and teach CONAF staff and local communities of the importance of these ecosystems and how to monitor their status and future changes.

We are also planning on giving talks at scientific conferences, as well as at local schools and communities to share our results and create awareness of the importance of these ecosystems.

Lastly, the results of this project will be published in the form of scientific articles, to make the results available to other scientists.

7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?

Funding was used over a 12-month period. We used most of the funds to finance the 2017 field season. However, some last funds were used in this year's field season, to set up fog collectors in each site.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Fuel	1600	1404	196	We ended up doing six, instead of seven sites, due to time constraints as explained above, so we required less funds.
Per diems	2400	2176	224	Sampling at six, instead of seven sites made a difference, and, more importantly, we were able to sample sites pretty efficiently, which saved us some time in the field.
Oil change	110	110	0	
Supplies	610	610	0	
Shipping and handling fees	130	550	-420	The money transfer fees were higher than expected, probably due to the different money exchanges (pound to dollar, dollar to Chilean pesos) needed and bank fees.
Field guide books	100	100	0	
Total	**4950**	**4950**	**0**	

9. Looking ahead, what do you feel are the important next steps?

In terms of research, I strongly believe that we need a better understanding of the mechanisms by which the plant species in these communities can cope with future changes in climate. We have a sense of the functional, but not the genetic diversity of species in these communities. If isolation is limiting the genetic diversity of the populations in these communities, it could limit their evolutionary potential.

Further, in order to get stakeholders to take the necessary measures to manage and/or protect these unique communities, I believe we need to raise awareness. Our experience has thought us that many are unaware of the existence of these green oases in the desert, the uniqueness of the species they harbour, and the potential threats these communities may be facing.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did The Rufford Foundation receive any publicity during the course of your work?

We have, and will continue to, acknowledge The Rufford Foundation at all formal and informal meetings, workshops, report and scientific publications. The logo will be used in all material produced with the data collected in the framework of this project. We have not had much opportunity to use the logo and acknowledge the foundation as of yet, as we are still working on the data and finalising results, but we will start doing so soon.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Dr Cristian Salgado – Cristian has been key to the development of this project. He was very involved in the planning and overseeing of the project, helped with data collection, and with sample processing. Cristian played a major role in supervising and performing the functional trait measurements.

More importantly, Cristian has ample experience in science outreach and education. He will play a key role as we move forward with the project and share our results with the scientific community, as well as with the local communities and schools.

Victor Pasten – Victor Pasten was not initially part of our team. However, since Victor Escobedo had to drop out of the project due to personal reasons, we recruited Victor Pasten.

Victor Pastene was highly involved in the project, mostly helping with field sampling. Victor is very knowledgeable of the flora of northern Chile, and hence his main contribution to the project has been to identify to species, all individuals found in the community survey. Some samples are still pending (due to certain problems, as stated above), but with the guidance and help from the Herbarium curator, professor Gina Arancio, Victor has made great progress.

Victor also has ample experience in science outreach, and hence will also participate of the workshops, talks and activities we have planned.

12. Any other comments?

We are incredibly grateful for The Rufford Foundation's support. This project allowed us to take the first steps towards determining the taxonomic and functional diversity of these communities, the threats they may be facing and what we can due to increase the chances of their long-term persistence in spite of continuously changing conditions. We are looking forward to continue this line of work in these very unique and interesting plant communities.

Supplementary table 1: Preliminary species list. End = Endemic (yes/no), CS = Conservation status (LC = Least Concern; VU = Vulnerable; EN = Endangered; DD = Data Deficient; NE = Not Evaluated), site are: PP = Paposo, TT = Taltal, ES = Esmeralda, QL = Quebrada León, CB = Carrizal Bajo, ET = El Tofo. "x" indicates the species is present in the site. P-Perennial/A-Annual/B- Biennial. N-Native/A-Alien. Y-Yes/N-No.

ID	**Family**	**Functional group**	**Life cycle P/A**	**Origin N/A**	**End**	**CS**	**Sites where present**					
							PP	**TT**	**ES**	**QL**	**CB**	**ET**
Adesmia microphylla	Fabaceae	Shrub	P	N	Y	LC						x
Adesmia tenella	Fabaceae	Forb	A	N	Y	LC						x
Alstroemeria graminea	Alstroemeriaceae	Forb	A	N	Y	VU				x		
Alstroemeria violacea	Alstroemeriaceae	Forb	P	N	N			x	x			
Alstroemeria magnifica	Alstroemeriaceae	Forb	P	N	Y	LC						x
Amblyopappus pusillus	Asteraceae	Forb	P	N	Y	LC			x	x	x	
Aristolochia chilensis	Aristolochiaceae	Forb	P	N	Y	LC						x
Asteriscium chilense	Apiaceea	Forb	P	N	Y	DD(LC?)					x	
Atriplex mucronata	Amaranthaceae	Shrub	P	N	Y	LC				x		
Atriplex semibaccata	Chenopodiaceae	Forb	P	A	N							x
Baccharis paniculata	Asteraceae	Shrub	P	N	Y	LC					x	x
Bahia ambrosoides	Asteraceae	Sub-shrub	P	N	Y	LC					x	x
Bakerolimon plumosum	Plumbaginaceae	Shrub	P	N	Y				x			
Balbisia peduncularis	Ledocarpaceae	Sub-shrub	P	N	N	LC	x	x			x	x
Bridgesia incisifolia	Sapindaceae	Shrub	P	N	Y	VU						x
Bromus berteroanus	Poaceae	Grass	A	N	N	LC						x
Calandrinia compressa	Montiaceae	Forb	A	N	N	LC						x
Cardionema ramosissima	Caryophyllaceae	Forb	P	N	N	LC						x
Carica chilensis	Caricaceae	Shrub	P	N	Y	VU						x

Centaurea chilensis	Asteraceae	Sub-shrub	P	N	Y						x	
Chaetanthera glabrata	Asteraceae	Forb	A/P	N	Y	LC		x	x			
Chaetanthera moenchioides	Asteraceae	Forb	A	N	N	LC		x	x			x
Chaetanthera tenella	Asteraceae	Forb	A	N	Y	LC				x		
Chenopodiastrum murale	Chenopodiaceae	Forb	A	A	N		x	x				
Chenopodium petiolare	Chenopodiaceae	Forb	P	N	N	LC					x	
Chiropetalum cremnophilum	Euphorbiaceae	Sub-shrub	P	N	Y	DD(LC?)	x					
Chorizanthe deserticola	Polygonaceae	Sub-shrub	P	N	Y	LC					x	
Cistanthe arenaria	Montianceae	Forb	P	N	N	LC						x
Cistanthe cachinalensis	Montiaceae	Forb	P	N	Y			x				
Cistanthe cephalophora	Montiaceae	Forb	A	N	Y	VU			x	x	x	
Cistanthe densiflora	Montiaceae	Forb	A	N	N	LC				x		
Cistanthe celosioides	Montiaceae	Forb	A	N	N	LC			x			
Cleome chilensis	Cleomaceae	Forb	A	N	N	DD(VU?)		x				
Copiapoa cinerea	Cactaceae	Cacti	P	N	Y	VU		x	x			
Corrigiola squamosa	Caryophyllaceae	Forb	P	N	Y	LC					x	x
Crassula connata	Crassulaceae	Forb	P	N	N	VU						x
Cristaria aspera	Malvaceae	Forb	P	N	Y	LC			x		x	
Cristaria dissecta	Malvaceae	Forb	A/P	N	N	LC						x
Cristaria integerrima	Malvaceae	Forb	A	N	Y	LC	x		x			
Cristaria molinae	Malvaceae	Forb	A	N	Y	LC	x	x	x	x		
Cristaria multiflora	Malvaceae	Forb	P	N	Y	DD(VU?)				x		
Cristaria viridiluteola	Malvaceae	Forb	A/P	N	Y	LC				x		
Cuscuta purpurata	Convolvulaceae	Forb	A	N	Y						x	x
Cyclospermum laciniatum	Apiaceae	Forb	A	N	N	LC				x	x	x
Descurainia nuttallii	Brassicaceae	Forb	A	N	N						x	

Dioscorea humifusa	Dioscoreaceae	Forb	P	N	Y	LC						x
Diplolepis boerhaviifolia	Apocynaceae	Sub-shrub	P	N	Y	LC					x	
Diplolepis viridis	Apocynaceae	Shrub	P	N	Y					x		
Domeykoa oppositifolia	Apiaceae	Forb	A	N	Y	DD(EX?)		x				
Echinopsis deserticola	Cactaceae	Cacti	P	N	Y	DD(LC?)	x	x			x	
Ephedra chilensis	Ephedraceae	Shrub	P	N	N	LC		x				
Epipetrum bilobum	Dioscoreaceae	Forb	P	N	Y						x	
Eremocharis fruticosa	Apiaceae	Shrub	P	N	Y					x		
Eriosyce taltalensis	Cactaceae	Cacti	P	N	Y	VU	x					
Erodium cicutarium	Geraniaceae	Forb	A/B	A	N		x	x				x
Erodium moschatum	Geraniaceae	Forb	A/B	A	N							x
Eulychnia breviflora	Cactaceae	Cacti	P	N	Y	EP		x		x	x	x
Euphorbia lactiflua	Euphorbiaceae	Shrub	P	N	Y	LC	x	x	x	x		
Fagonia chilensis	Zygophyllaceae	Forb	P	N	N	LC			x			
Frankenia chilensis	Frankeniaceae	Shrub	P	N	N	LC	x	x	x	x	x	
Fuchsia lycioides	Onagraceae	Shrub	P	N	Y	LC						x
Fuertesimalva chilensis	Malvaceae	Forb	A	N	N	DD						x
Galium aparine	Rubiaceae	Forb	A	A	N							x
Gamochaeta monticola	Asteraceae	Forb	A	N	N	NE						x
Gilia laciniata	Polemoniaceae	Forb	A	N	N	LC						x
Gochnatia foliosa	Asteraceae	Shrub	P	N	Y	DD					x	
Gypothamnium pinifolium	Asteraceae	Shrub	P	N	Y				x			
Helenium atacamense	Asteraceae	Forb	A/B	N	Y	LC		x		x		
Helenium urmenetae	Asteraceae	Forb	A/B	N	Y	LC						x
Heliotropium inconspicuum	Boraginaceae	Shrub	P	N	Y	EP			x			
Heliotropium linariifolium	Boraginaceae	Shrub	P	N	Y				x			
Heliotropium myosotifolium	Boraginaceae	Shrub	P	N	Y	LC					x	
Heliotropium taltalense	Boraginaceae	Shrub	P	N	Y		x					

Heliotropium stenophyllum	Boraginaceae	Shrub	P	N	Y	LC						x
Herniaria cinerea	Caryophyllaceae	Forb	A	A	N							x
Jarava tortuosa	Poaceae	Forb	P	N	Y					x		
Jarava plumosa	Poaceae	Forb	P	N	N	LC					x	
Lamarckia aurea	Poaceae	Grass	A	A	N							x
Lastarriaea chilensis	Polygonaceae	Forb	A	N	Y	LC					x	x
Leucheria cerberoana	Asteraceae	Forb	A	N	Y	LC		x			x	
Leucocoryne macropetala	Amaryllidaceae	Forb	P	N	Y	LC					x	x
Loasa elongata	Loasaceae	Forb	A	N	Y	LC	x	x			x	
Loasa tricolor	Loasaceae	Forb	A	N	N	LC						x
Lobelia polyphylla	Campanulaceae	Shrub	P	N	Y	LC						x
Lycium minutifolium	Solanaceae	Shrub	P	N	Y	LC					x	
Malesherbia humilis	Malescherbiaceae	Forb	A	N	Y	LC		x		x		
Malva nicaeensis	Malvaceae	Forb	P	A	N							x
Mathewsia foliosa	Brassicaceae	Forb	P	N	Y	DD(LC?)					x	
Mathewsia incana	Brassicaceae	Sub-shrub	P	N	Y	LC			x	x		
Medicago polymorpha	Fabaceae	Forb	A	A	N							x
Menonvillea chilensis	Brassicaceae	Forb	A	N	Y	LC				x		
Menonvillea linearis	Brassicaceae	Forb	A	N	Y	VU						x
Mesembryanthemum crystallinum	Aizoaceae	Forb	A	A	N		x	x			x	x
Mesembryanthemum nodiflorum	Aizoaceae	Forb	A	A	N							x
Microphyes litoralis	Caryophyllaceae	Forb	A	N	N					x		
Monnina leariforme	Polygalaceae	Forb	P	N	N							x
Montiopsis trifida	Montiaceae	Forb	A	N	Y	LC					x	
Moscharia pinnatifida	Asteraceae	Forb	A	N	Y	LC						x
Myrcianthes coquimbensis	Myrtaceae	Shrub	P	N	Y	EP						x

Nicotiana solanifolia	Solanaceae	Sub-shrub	P	N	Y	LC		x				
Nolana aplocaryoides	Solanaceae	Forb	A	N	N				x			
Nolana baccata	Solanaceae	Forb	A	N	Y	LC	x					
Nolana crassulifolia	Solanaceae	Shrub/sub-shrub	P	N	Y	LC	x	x	x		x	
Nolana divaricata	Solanaceae	Sub-shrub	P	N	Y	LC		x	x	x	x	
Nolana elegans	Solanaceae	Forb	A	N	Y	LC		x		x		
Nolana salsoloides	Solanaceae	Shrub	P	N	Y	LC			x	x		
Nolana sedifolia	Solanaceae	Sub-shrub	P	N	Y	LC		x	x		x	
Nuttallanthus texanus	Plantaginaceae	Forb	A	A	Y							x
Ophryosporum triangularis	Asteraceae	Shrub	P	N	Y	LC	x	x				x
Oxalis megalorhiza	Oxalidaceae	Forb	P	N	N		x		x		x	x
Oxalis ornithopus	Oxalidaceae	Forb	P	N	Y	DD(EX?)			x			
Oxalis gigantea	Oxalidaceae	Shrub	P	N	Y	LC		x	x		x	x
Oxalis micrantha	Oxalidaceae	Forb	A	N	N	LC		x		x	x	x
Oxalis tortuosa	Oxalidaceae	Forb	P	N	Y	LC						x
Oziroe biflora	Asparagaceae	Forb	P	N	N	LC	x			x	x	x
Parietaria debilis	Urticaceae	Forb	A	N	N	LC			x	x		
Pasithea caerulea	Hemerocallidaceae	Forb	P	N	N	LC						x
Pectocarya dimorpha	Boraginaceae	Forb	A/B	N	Y	LC				x		
Pectocarya linearis	Boraginaceae	Forb	A	A	N	LC						x
Perityle emoryi	Asteraceae	Forb	A	N	N	LC	x	x	x	x		
Plantago hispidula	Plantaginaceae	Forb	A	N	Y	LC	x	x	x	x	x	x
Polyachyrus annuus	Asteraceae	Forb	A	N	N		x	x				
Polyachyrus fuscus	Asteraceae	Sub-shrub	P	N	N	LC			x	x	x	
Polyachyrus poeppigii	Asteraceae	Sub-shrub	P	N	Y	LC						x
Proustia cuneifolia	Asteraceae	Shrub	P	N	Y		x					
Quinchamalium chilense	Santalaceae	Forb	P	N	N	LC	x				x	

Rhodophiala laeta	Amaryllidaceae	Forb	P	N	Y	DD(LC?)		x				
Rhodophiala phycelloides	Amaryllidaceae	Forb	P	N	Y	LC					x	x
Rostraria cristata	Poaceae	Grass	A	A	N							x
Schismus arabicus	Poaceae	Grass	A	A	N							x
Schizanthus laetus	Solanaceae	Forb	A	N	Y	DD(EX?)		x				
Schizanthus litoralis	Solanaceae	Forb	A	N	Y	LC						x
Senna cumingii	Fabaceae	Shrub	P	N	Y	LC					x	x
Sicyos baderoa	Cucurbitaceae	Forb	A	N	Y	LC						x
Sisymbrium irio	Brassicaceae	Forb	A	A	N		x					
Solanum brachyantherum	Solanaceae	Forb	P	N	Y	VU	x					
Solanum remyanum	Solanaceae	Forb	P	N	Y	LC	x				x	
Solanum chilense	Solanaceae	Forb	P	N	Y			x				
Sonchus asper	Asteraceae	Forb	A/B	A	N							x
Sonchus oleraceus	Asteraceae	Forb	A	A	N		x	x				
Spergularia arbuscula	Caryophyllaceae	Sub-shrub	P	N	Y	LC					x	
Spergularia denticulata	Caryophyllaceae	Forb	A	N	Y	VU			x			
Spergularia pycnantha	Caryophyllaceae	Forb	P	N	Y	DD(VU?)				x		x
Stachys truncata	Lamiaceae	Forb	A	N	Y	LC						x
Suaeda foliosa	Amaranthaceae	Sub-shrub	P	N	N	LC			x			
Tetragonia maritima	Aizoaceae	Shrub	P	N	Y						x	
Tetragonia ovata	Aizoaceae	Forb	A	N	Y	LC			x	x	x	
Tetragonia pedunculata	Aizoaceae	Forb	A	N	N	LC					x	
Tiquilia litoralis	Boraginaceae	Sub-shrub	P	N	N					x		
Torilis nodosa	Apiaceae	Forb	A	A	N							x
Triptilion gibbosum	Asteraceae	Forb	A	N	Y	DD(LC?)					x	
Tropaeolum tricolor	Tropaeolaceae	Forb	P	N	Y	LC						x
Tropaeolum tricolor	Tropaeolaceae	Forb	P	N	Y	LC	x					

Viola polypoda	Violaceae	Forb	A	N	Y	LC	x	x		x		
Viola pusilla	Violaceae	Forb	A	N	Y	LC						x
Zephyra elegans	Tecophilaceae	Forb	P	N	Y	LC		x			x	