

Applicant: **Groombridge, Jim**  
Organisation: **University of Kent**  
Funding Sought: **£35,000.00**

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## **DIR27FW\1012**

Increase capacity in Colombia and Costa Rica for applying molecular genetic techniques by training the Fellow in molecular laboratory and analytical skills involving nuclear and mitochondrial DNA, and equipping her with knowledge to help guide captive-breeding efforts, wild population management and reintroduction plans for the critically-endangered Great Green Macaw.

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## Section 1 - Contact Details

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### PRIMARY APPLICANT DETAILS

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Title	Prof
Name	Jim
Surname	Groombridge
Website (Work)	[REDACTED]
Tel (Work)	[REDACTED]
Email (Work)	[REDACTED]
Address	[REDACTED]

### GMS ORGANISATION

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Type	Organisation
Name	University of Kent
Phone (Mobile)	[REDACTED]
Email (Work)	[REDACTED]
Website (Work)	[REDACTED]
Address	[REDACTED]

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## Section 2 - Title, Dates & Budget Summary

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### Q3. Name and official address of proposed Darwin Fellow

(include email address). Please include a one page CV with the package of CVs for Q7.

Name	Ms Salome Lopez
Address	[REDACTED]
Email Address	[REDACTED]

### Q4. Summary of proposed Fellowship i.e. Outcome

Increase capacity in Colombia and Costa Rica for applying molecular genetic techniques by training the Fellow in molecular laboratory and analytical skills involving nuclear and mitochondrial DNA, and equipping her with knowledge to help guide captive-breeding efforts, wild population management and reintroduction plans for the critically-endangered Great Green Macaw.

### Q5. Project dates

<b>Start date:</b>	<b>End date:</b>	<b>Duration (e.g. 1 year, 2 months):</b>
01 August 2021	30 September 2022	14 months

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### Q6. Budget summary

	2021/2022	2022/2023	Total
Darwin funding request (Apr - Mar) £	25,050.00	9,950.00	35,000.00

## Section 3 - Principals

### Q7. Principals in the Project

Please give the details of the individuals from the Lead Organisation (and other institutions if relevant) who would be directly involved in supervising/working with the Darwin Fellow. Please provide a one page CV for each of these named individuals and remember to include the Fellow's CV in the PDF.


Details	Project Leader	Other Expert	Other Expert	Other Expert
Surname	Groombridge	Williams	Beckerman	Tollington
Forenames(s)	Jim	Sam	Andrew	Simon
Post held	Professor of Biodiversity Conservation	Executive Director	Professor of Evolutionary Ecology	Lead Conservation Scientist
Organisation	DICE, Kent University	Macaw Recovery Network	Sheffield University	Chester Zoo

Do you require more fields?


Yes

Details	Other Expert	Other Expert	Other Expert
Surname	Fuchs	No Response	No Response
Forenames(s)	Eric	No Response	No Response
Post held	Lecturer, Escuela de Biología	No Response	No Response
Organisation	Universidad de Costa Rica	No Response	No Response
		No Response	No Response
		No Response	No Response

Please provide a one page CV for each of these named individuals, including the Fellow named at Q3, uploaded as one PDF.

 [CVs of Fellowship Supervisory Team](#)

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## Section 4 - Aims, Activities & Achievements

### Q8. Describe briefly the aims, activities and achievements of the Lead Organisation

(Large organisations please note this should describe your unit or department)

The Durrell Institute of Conservation and Ecology (DICE) conducts applied conservation research that breaks down the barriers between the natural and social sciences. It aims to conserve biodiversity and the ecological processes that support ecosystems and people, by developing capacity and improving conservation management and policy through high-impact research. DICE has trained over 1300 conservation scientists worldwide which now comprise its global alumni network. In 2019 DICE was awarded a prestigious Queen's Anniversary Prize in recognition of its "pioneering education, capacity-building and research in global nature conservation to protect species and ecosystems and

benefit people". DICE leads a wide range of conservation projects, with long-standing conservation research programmes in Malaysia, community-based conservation projects in India, research into the effects of biodiversity on human-wellbeing, and long-term recovery projects on endangered taxa such as Mauritius parakeets, Seychelles frogs, Madagascan reptiles and Mexican axolotls. DICE works closely with in-country NGOs and governments worldwide.

### **Q9. Describe briefly the aims, activities and achievements of the proposed Darwin Fellow's employing organisation.**

**(Large organisations please note this should describe your unit or department)**

The Costa Rican-based Macaw Recovery Network (MRN) aims to recover endangered neotropical parrot populations through hands-on conservation strategies and through leading an international network that develops and implements conservation action. MRN conservation projects take place in two locations: (i) their field base located in the north of Costa Rica, in the province of Heredia, where effective population monitoring and management activities for the Great Green Macaw (GGM) are conducted throughout the year, and (ii) the MRN Captive-Breeding Centre for Scarlet macaws and GGMs located on the North-Pacific coast, in Punta Islita, where breeding and non-breeding ex situ populations of both macaws species are managed, together with the Punta Islita Wild Macaw Reserve where a reintroduced population of Scarlet Macaws is monitored. MRNs future plans for genetically-informed breeding of captive GGMs and reintroductions based on landscape genetics of the remaining wild population closely align with the Fellowships proposed objectives.





### **Q10. Describe briefly the proposed Fellow's current role within their organisation and their link to a Darwin project (if applicable), including the project reference number, his/her role in that project and any ongoing involvement.**

**If the Fellow has no link to a Darwin project please discuss their involvement in implementing the biodiversity conventions, treaties and agreements supported by the Darwin Initiative.**

Ms Salome Lopez is currently an MRN collaborator based in Colombia. Through her networking activities, she obtained blood samples from the "Parque de la Conservacion" (PC) GGM zoo population and is currently optimizing microsatellite DNA markers at the "Ecologia y Evolucion de Vertebrados" research laboratory in the Universidad de Antioquia, Colombia. Her work, supported by Colombian researchers, kick-started the genetic research on this CITES-listed critically-endangered species, while supporting regional research. Her fellowship project will support The Nagoya Protocol since (i) the final microsatellite marker-set will be optimised in-country where the GGM is naturally distributed, of the work will involve local researchers, and research findings and conservation actions emerging from it will be shared with regional partners such as PC and local stakeholders. Supported by her international supervisory team, Salome will positively impact conservation efforts for the species in Colombia and in Costa Rica.

Salome is committed to empowering female young biologists and breaking traditional gender roles for female field biologists; she has already trained several local undergraduate students in avian field techniques – supporting SDG #5.5 ('effective participation/equal opportunities for leadership'). Salome's Fellowship project will promote SDGs 15.4 ('promote equitable access to benefits of genetic resources') and 15.5 ('prevent extinction').

**Please provide a combined PDF of all Letters of Support.**

 [Letters Confirming Support\\_GROOMBRIDGE FELLOWSHIP APPLICANT](#)  
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## **Section 5 - Outcomes & Objectives**

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### **Q11. Provide a concept note for the Darwin Fellowship. This should include:**

**Q11a. A clear outline of the aim and objectives of the Fellowship, and an indication of how the achievement will be measured**

This Fellowship project will build vital capacity for applied conservation genetics in Colombia and Costa Rica, and will form the basis for the Fellow's Biodiversity Management Masters-by-Research at DICE (University of Kent). The Fellow will perform molecular genetic analysis to genotype 100+ GGMs for microsatellite DNA variation to quantify relatedness amongst captive birds, and genetic diversity amongst wild birds, in order to guide reintroduction plans in a way that minimises inbreeding risks that lower reproductive success. Ms Lopez will achieve this by:

1. Using a previously-developed set of 15+ polymorphic microsatellite markers for wild and captive GGMs to accurately quantify individual estimates of relatedness, inbreeding and levels of genetic diversity in in-situ and ex-situ populations.
2. Building a pedigree of captive GGMs based on genetic relatedness to improve decisions on selecting which individuals to form breeding pairs (existing studbooks lack any genetic information of founding individuals). This new information will shed light on the cause of the low

productivity documented for captive GGMs (<23% hatch success 2017-2019; 0.11 fledglings per breeding attempt in 2019), which is considered to be caused unintentionally by either inbreeding depression, or outbreeding depression (breeding between individuals locally-adapted to very different environments). Achievement will be measured by analysis of genetic data confirming consistent measures of relatedness, and reconstruction of the genetic pedigree.

3. Identifying genetic structure/patterns of geneflow among wild individuals in the Costa Rican population to (i) identify population fragments requiring reconnection via future reintroduction, and (ii) detect any genetically impoverished regions which might benefit from augmentation via future targeted releases. Achievement will be measured by incorporation of genetic data into reintroduction planning.

The Fellowship will provide vital information necessary for conservation management of GGMs and help bridge the gap between in situ and ex situ strategies as advocated by IUCN's One-Plan Approach.

#### **Q11b. The role of the Lead Organisation, and others where relevant**

DICE's Biodiversity Management Program is focused on applied conservation research to improve conservation management. One of DICE's long-standing key areas of research and expertise, amongst other topics, focuses on genetic studies to support on-the-ground recovery programmes aiming to restore threatened species. Alongside this, DICE's broader focus on using ecological approaches to maintain biodiversity and improving conservation practices, will ensure Ms Lopez benefits from a nurturing environment amongst a strong and diverse postgraduate student conservation community.

Prof Jim Groombridge, Professor of Biodiversity Conservation and Program Convenor for Conservation Project Management will supervise Ms Lopez and host her in the DICE Conservation Genetics Research laboratory, where she will receive training in molecular techniques and analyses of genetic data. Prof Groombridge has over 20 years expertise in conservation genetics of endangered species, including rare parrots.

MRN (Dr Williams) will provide field logistical support, guaranteeing sample collection for this Fellowship project.

Chester Zoo (Dr Tollington) will provide institutional support for sample/data acquisition from international/regional zoo partners alongside additional guidance on data analyses, guaranteeing this project a strong entry velocity.

Sheffield University (Prof Beckerman) will contribute a microsatellite library for the GGM that has already been developed (and primer pairs identified), and additional analytical/data support alongside matched funding of £[REDACTED] from a British Ecological Society Small Grant for lab consumable costs.

Universidad de Costa Rica (Prof Eric Fuchs) will provide in-country lab infrastructure at the Ecología Molecular research laboratory including access to an ABI genescanner, to support in-country genotyping of wild and captive Costa Rican GGMs.

Universidad de Antioquia in Colombia (Catalina Gonzales) will provide in-country support via the research laboratory of Ecología y Evolucion de Vertebrados, to facilitate use of further microsatellite loci to create a robust marker set for GGMs.

## **Section 6 - Legacy & Collaboration**

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### **Q12. Legacy**

**Provide information on how the Darwin Fellow will utilise, promote and disseminate the benefits of the Fellowship on return to their home country. Will a strategy be developed during the Fellowship to ensure this is achieved?**

Ms Lopez's home country is Colombia, where currently there are no conservation efforts to conserve the GGM, or specialized conservation non-profit organizations focused on parrots. This situation galvanised Ms Lopez to contact MRN in Costa Rica, and led to the current strong collaboration. Upon completion of her fellowship, Ms Lopez will (i) share the benefits of her fellowship with MRN and directly impact GGM management strategies in Costa Rica, and (ii) directly engage previously identified stakeholders from key local communities in Costa Rica and Colombia in order to involve them in future plans for reintroducing GGMs.

Ms Lopez has built a strong relationship with Parque de la Conservacion, in Medellín, Colombia, where an ex situ GGM population is currently held - presenting strong potential for regional conservation efforts. Ms Lopez will share with this partner her skills learned during her Fellowship and those she has gained from MRN, to disseminate them and pave the way for future GGM conservation efforts and monitoring activities across the species' range in Colombia. As a trained and networked conservationist, Ms Lopez will spearhead future conservation work, acting as a mentor and regional 'species champion' and 'science communicator' for conservation of macaws and their habitat.

**Q13. How will the Fellowship assist the Fellow's organisation and/or local communities and/or home country in working towards the objectives (or implementation) of the Conventions, Treaties and Agreements supported by the Darwin Initiative?**

**Please refer to specific Articles or cross cutting themes as appropriate.**

The fellowship aligns with:

- Darwin Objective #8, because it promotes the sustainable access to genetic resources and facilitates the sharing of the benefits obtained from them.

- The Nagoya Protocol, since it will set in motion a regional and international collaboration between conservation scientists led by the fellow, to understand and share knowledge derived from a species' genetic diversity. Furthermore, in agreement with Nagoya protocol, the results of the research will be utilized in Costa Rica to optimize in situ and ex situ conservation management for the critically-endangered GGM. The information will also be shared with local stakeholders and impact conservation efforts beyond Costa Rica and Colombia via MRN networking, therefore facilitating "equitable sharing of benefits arising out of the utilization of genetic resources".
- Sustainable Development Goals, specifically Objectives #4 (Eliminate gender disparities in education), #5 (Equal opportunity for leadership) and #8 (Decent work and economic growth). By supporting a female fellow, the Darwin Initiative will be promoting an inclusive learning opportunity, and facilitating her access to world-class education, which will ultimately empower her as a future leader and promote her productive employment in conservation, promoting gender-balanced economic growth in Central/South America.

**Q14. What collaboration has there been with the Darwin Fellow to date in developing the proposal, and what collaboration is planned for the duration of the Fellowship?**

**Where relevant, describe any consultation or collaboration by the proposed Fellow within their own country.**

Ms Lopez has been collaborating with MRN since 2019, when she led field expeditions in Colombia to survey GGMs in different (and very challenging) sites in Colombia in order to identify threats for the species and assess practicality of working there. Ms Lopez has played a central role in designing the project objectives and developing relationships with relevant stakeholders, such as Parque de la Conservacion in Colombia. The Parque de la Conservacion wishes to integrate conservation genetic information into their captive management program, as does MRN; Ms Lopez's networking has made this important collaboration possible. She currently works on the GGM genetics project and was involved in developing the objectives/methods/expected outputs/potential uses of the research and relevant budget aspects of this fellowship application, working closely with MRN senior associated researchers. Ms Lopez has also led and has been involved in writing grants to gather funds for the research, and is currently optimizing hetero-specific microsatellite markers for the GGM to be used during this Fellowship.

We plan for Ms Lopez to participate in wild and captive sampling, and lead the DNA work in Costa Rica, and to lead the genotyping and data analysis as her Masters research project at DICE.

**Q15. Where will the Darwin Fellow be based?**

**Please be specific with organisational details and dates (where more than one location).**

From 1st August 2021 to January 2022 Ms Lopez will be based at DICE (University of Kent, UK) where she will be a registered postgraduate student from September 2021-August 2022). At DICE Ms Lopez will benefit from practical training in molecular genetic analyses alongside specific taught classes on population biology.

Ms Lopez will travel to Costa Rica in December 2021 to conduct a field season at the Macaw Recovery Network Field Station to collect samples/data for the project and to carry out initial lab/molecular work (until March 2022) in San José in Costa Rica, hosted by Dr Eric Fuchs in the molecular genetics research laboratory from the Universidad de Costa Rica for training in DNA extraction, microsatellite genotyping and use of ABI gene-scanner. She will spend April until June 2022 at DICE/Kent for completing lab work, data analyses and July/August for thesis write-up. September 2022 will be dedicated to dissemination activities which will continue upon return from UK to Colombia/Costa Rica.

Samples of all captive GGMs at Parque de la Conservacion Zoo in Colombia have already been collected; furthermore, sampling from the captive GGM population in Costa Rica is already underway, ensuring a strong entry velocity for this Fellowship project.

**Section 7 - Programme of Work & Funding**

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**Q16. Provide a programme of work, including key milestones, through the duration of the Fellowship**

**Provide a project implementation timetable that shows the key milestones in project activities. Please complete the Excel spreadsheet linked below to describe the intended workplan for your project.**

[Fellowship Implementation Timetable Template](#)

**For each activity (add/remove rows as appropriate) indicate the number of months it will last, and fill/shade only the months in which an activity will be carried out.**





- R27 Fellowship Implementation Timetable GROOMBRIDGE
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**Q17. Costs**

Using UK Government Financial Years (April 2021 – March 2022), please complete your budget using the template provided here and upload below.

[Fellowship Budget Template](#)

Please note, this should not be presented as academic years.

 [R27 Fellowship Budget FINAL AEG2](#)  
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 xlsx 23.61 KB

## Q18. Other Sources of funding: provide details and amounts

Date applied for	Donor Organisation	Amount (include currency)	Comments (including confirmed/unconfirmed)
04 September 2020	British Ecological Society	█ GBP	Confirmed, Grant successful
<i>No Response</i>	Indianapolis Zoo	█ USD	Confirmed, Matched funding for British Ecological Society Grant
<i>No Response</i>	Macaw Recovery Network	█ GBP	Confirmed
<i>No Response</i>	University of Kent	█ GBP	Confirmed, Financial contribution by University of Kent towards international registration fee for this fellowship.

## Q19. FCO Notification

Please check the box if you think that there are sensitivities that the Foreign and Commonwealth Office will need to be aware of should they want to publicise details of the Darwin Fellowship and the resultant work in the UK or the Darwin Fellow's home country.

Unchecked

Please comment on whether you require a visa to undertake this Fellowship. If you require a visa, do you foresee any difficulty in being granted a visa?

Ms Lopez will need an student visa to undertake the fellowship. Ms Lopez doesn't foresee any difficulties in being granted a visa, since she has held and used responsibly major visas (USA visa, Schengen visa) in the past.

## Section 8 - Certification

### Certification

On behalf of the

Company

of

University of Kent

I apply for a grant of





£35,000.00

I certify that, to the best of our knowledge and belief, the statements made by us in this application are true and the information provided is correct. I am aware that this application form will form the basis of the project schedule should this application be successful.

(This form should be signed by an individual authorised by the applicant institution to submit applications and sign contracts on their behalf.)

- I enclose one page CVs for project principals and letters of support as requested in the Guidance.

Checked

Name	Jim Groombridge
Position in Organisation	Professor of Biodiversity Conservation
Signed	 <a href="#">JG Signature</a>  15/01/2021  21:09:36  jpg 23.96 KB
Dated	15 January 2021

## Section 9 - Submission Checklist

I have read the Guidance.	Checked
I have read, and can meet, the current Terms and Conditions for this fund.	Checked
I have provided actual start and end dates for the Fellowship.	Checked
I have provided my budget based on UK government financial years i.e. 1 April – 31 March.	Checked
I have checked that my budget is complete, correctly adds up and that I have included the correct final total in the application.	Checked
The application been signed by a suitably authorised individual (clear electronic or scanned signatures are acceptable).	Checked
I have included a 1 page CV for the proposed Fellow and the experts listed in Question 7.	Checked
I have provided the relevant letters of support.	Checked
I have checked the Darwin website immediately prior to submission to ensure there are no late updates.	Checked
I have read and understood the Privacy Notice on GOV.UK.	Checked

### We would like to keep in touch!

**Please check this box if you would be happy for the lead applicant (Flexi-Grant Account Holder) and project leader (if different) to be added to our mailing list. Through our mailing list we share updates on upcoming and current application rounds under the Darwin Initiative and our sister grant scheme, the IWT Challenge Fund. We also provide occasional updates on other UK Government activities related to biodiversity conservation and share our quarterly project newsletter. You are free to unsubscribe at any time.**

Checked

### Data protection and use of personal data

Information supplied in this application form, including personal data, will be used by Defra as set out in the latest copy of the Privacy Notice for Darwin, Darwin Plus and the Illegal Wildlife Trade Challenge Fund available [here](#). This Privacy Notice must be provided to all individuals whose personal data is supplied in the application form. Some information, but not personal data, may be used when publicising the Darwin Initiative including project details (usually title, lead organization, location, and total grant value) on the GOV.UK and other websites.

Information relating to the project or its results may also be released on request, including under the 2004 Environmental Information Regulations and the Freedom of Information Act 2000. However, Defra will not permit any unwarranted breach of confidentiality nor will we act in contravention of our obligations under the General Data Protection Regulation (Regulation (EU) 2016/679).