

Evaluating the impact of the first 10 years of the Cambridge Masters in Conservation Leadership

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Abstract Conservation lacks sufficient well-trained leaders who are empowered to catalyse positive change for the natural world. Addressing this need, the University of Cambridge launched a Masters in Conservation Leadership in 2010. The degree includes several features designed to enhance its impact. Firstly, it recruits international, gender-balanced cohorts of mid-career professionals, building leadership capacity in the Global South and providing a rich environment for peer learning. Secondly, teaching includes applied leadership training in topics such as fundraising, leading people and networking, as well as interdisciplinary academic topics. Thirdly, the degree is delivered through the Cambridge Conservation Initiative, a partnership of international NGOs and networks, facilitating extensive practitioner-led and experiential learning. We present details of programme design and evaluate the impact of the Masters after 10 years, using data from course records, student and alumni perspectives, and interviews with key stakeholders. The course has broadly succeeded in its design and recruitment objectives. Self-assessed leadership capabilities, career responsibilities and the overall impact of alumni increased significantly 5 years after graduation. However, specific impacts of alumni in certain areas, such as on their professional colleagues, have been less clear. We conclude by outlining future plans for the Masters in light of growing demands on conservation leaders and the changing landscape of leadership capacity development. These include reforms to course structure and assessment, long-term support to the alumni network and developing a conservation leadership community of practice.

Keywords Biodiversity conservation, capacity building, capacity development, conservation leadership, experiential learning, interdisciplinarity, monitoring and evaluation, training

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Introduction

Despite decades of effort and funding, the global conservation movement is not achieving its goals (Buchanan et al., 2020). The lack of capacity amongst conservationists and their organizations has been identified as a factor limiting success (Elliott et al., 2018). There are multiple dimensions to conservation capacity, including technical skills, governance and the availability of adequate resources (O'Connell et al., 2019). Conservation leadership has been identified repeatedly as a particularly important, key dimension of capacity (Dietz et al., 2004; Manolis et al., 2009; Bruyere, 2015; Evans et al., 2015). For example, Dietz et al. (2004) stated that 'leadership is arguably the most important attribute in the tool kit of a conservation biologist' (p. 274) and Gutierrez et al. (2011) identified leadership as the most important factor promoting success in co-managed fisheries.

A conservation leadership literature has begun to emerge over the last decade, within which several themes can be identified. Firstly, leadership is about change, rather than continuity, involving qualities such as vision, innovation and inspiration (Black et al., 2011). Secondly, it is not automatically associated with holding a position of authority (Case et al., 2015). Change makers can play diverse roles in society, including as artists, campaigners and educators as well as government ministers and chief executives. Thirdly, where once leadership was considered an individual trait that is either present or absent, it is now considered a bundle of skills and strategies that can be improved through training and experience (Kainer et al., 2019). Fourthly, leadership can be a property of networks and collectives, rather than of individuals acting in isolation (Olsson et al., 2008; Ngwenya et al., 2020). Fifthly, understanding of leadership has evolved, from an early heroic model to a complex range of leadership concepts, including situational, authentic and transformational leadership (Bruyere, 2015). This has been accompanied by recognition that effective leadership requires an explicit awareness of cultural context (Straka et al., 2018).

Several authors have provided holistic assessments of this emerging literature. Case et al. (2015) argued that leadership can be framed as person, as position, as process, as purpose and as result. Bruyere (2015) drew on a literature review and a survey of practitioners to argue that 'conservation leadership includes skills to establish a vision, define and integrate values, manage conflict, build partnerships, and manage

adaptively' (p. 381). Black (2019) provided a comprehensive review of the conservation leadership literature, making links to emerging understanding of leadership in the field of psychology.

It has been argued that the current state of leadership capacity in conservation is deficient. Focusing on those holding positions of authority, many conservation leaders have been criticized for being stuck in the mould of a heroic silverback (Nelson & Myers Madeira, 2016), for lacking interpersonal competencies critical for leadership (Englefield et al., 2019), and for having training and experience that prepares them to be conservation scientists rather than conservation leaders (Muir & Schwartz, 2009). Historically, most leaders in positions of authority have been men, although this is beginning to change (Tallis & Lubchenco, 2014; Jones & Solomon, 2019). Many individuals in senior roles within conservation organizations have not been trained in what the draft Convention on Biological Diversity (CBD) Strategic Framework for Capacity Development (CBD, 2020) calls individual-level 'soft capacity' such as personal values, relational skills, social and emotional intelligence, problem solving skills, the ability to self-reflect, and analytical and logical thinking.

To address these shortfalls, several authors have called for specialist conservation leadership training programmes (e.g. Dietz et al., 2004; Muir & Schwartz, 2009; Englefield et al., 2019). In response, specialist capacity development programmes have been established. These include short courses for professionals (e.g. Kinship Conservation Fellows; the African Wildlife Foundation Conservation Management Training Programme), funding and training for young professionals (e.g. the Conservation Leadership Programme; the WWF Russell E. Train Fellowships) and postgraduate degree training (e.g. the MSc in Conservation Project Management at the University of Kent, UK; the Masters in Conservation Leadership Through Learning at Colorado State, USA; and the MBA for Conservation Leaders at the African Leadership University, Rwanda). A recent review of these programmes identified several common strengths, including experiential learning, and cohort-based peer learning and mentoring (Bruyere et al., 2020). However, it also identified unmet needs, including long-term graduate support, rigorous impact evaluation, mainstreaming of mentoring, and normalization of diversity and inclusion teaching (Bruyere et al., 2020).

This article focuses on the Masters in Conservation Leadership (hereafter Masters) offered at the University of Cambridge in the UK. Established in 2010, this programme was among the first to adopt conservation leadership teaching at Masters level. The degree has now run for 10 years and we, the current course team and founding director, take this opportunity to assess its impact, and to reflect on lessons learnt for conservation leadership capacity development.

After describing the origins and design of the degree we present impact data from several sources. We identify key lessons learnt, and discuss plans for the programme's future in light of the changing demands on conservation leaders and the emergence of new training programmes around the world.

The Cambridge Masters in Conservation Leadership

The idea of a postgraduate professional conservation training programme based in Cambridge was in circulation by 2002, and by 2007 this had developed into plans for a Masters in Conservation Leadership. Those developing the concept recognized that Cambridge provided a unique opportunity to develop such a programme because of the presence of the Cambridge Conservation Initiative (CCI). Established in 2007, CCI brings together the University of Cambridge and nine international NGOs and networks, all based in or near Cambridge. With the support of a significant founding gift from the MAVA Fondation pour la Nature, the Masters was established within the University of Cambridge Department of Geography, selected because of the conservation research and teaching carried out in the department and its previous experience in running Masters degrees. The first director of the Masters was recruited in 2009 and the course welcomed its first students in October 2010. Since 2015 the course has been located in the David Attenborough Building, which houses c. 500 staff working across all CCI partner organizations.

Although it was not established with an explicit theory of change, the Masters was designed from the beginning to address the perceived shortcomings in existing capacity development programmes. Firstly, the course sought to admit students with at least 3 years of professional experience and who would help to address the under-representation of women and those from less developed countries in conservation leadership positions. This recruitment policy was intended to enable rich peer-to-peer learning, and to contribute to achieving a more diverse community of leaders in conservation. Implementing this policy has been facilitated by generous provision of scholarship funding from individual donors and charitable foundations (such as Arcadia), CCI NGOs such as Fauna & Flora International, and the wider University of Cambridge. Scholarships have also been funded externally by the UK government (particularly through the Chevening Scholarships scheme), and by governments in students' home countries. Total funding from these combined sources was at least USD 7.4 million from 2011 to 2020. This is a conservative figure for total scholarship support as it does not include awards paid directly to the students, or to the University on the behalf of students.

Secondly, the content of the degree was focused on applied issues of leadership and management, and

interdisciplinary academic content. This was in contrast to most other Masters level conservation courses that focus on the development of largely biological research skills, often as a step towards a PhD. The Masters has six taught modules. One provides a broad introduction (Conservation Leadership Problems and Practice), three focus on applied skills (Conservation Management, Communicating Conservation and Innovation for Conservation) and two focus on interdisciplinary academic content (Conservation Enterprise and Conservation Governance). Examples of professional content covered include strategic planning, financial management, fundraising, advocacy, and broadcast media skills. Fundamentals of conservation biology are not taught, although students who wish to gain these skills can attend relevant undergraduate courses run by the Department of Zoology.

Thirdly, practitioners and their organizations were integrated into the delivery of the degree. Classroom sessions are led by experts, whether practitioner or academic, on each particular topic. Contributors mostly provide a single seminar session, unlike the usual model at the University of Cambridge in which one lecturer teaches multiple seminars or a whole module. The integration of practitioners enables multiple opportunities for experiential learning, including: a group consultancy project and individual capstone professional placement, both of which are hosted by conservation organizations; professional mentoring from carefully selected senior staff from within the CCI community, who receive training and meet with the student at least three times during the academic year; a networking dinner exercise, hosted by the Chief Executive Officer of Fauna & Flora International, and attended by high profile guests, during which students receive networking training and feedback from the guests on the strengths and weaknesses of their networking skills; and the opportunity to attend several Conservation Leadership Lectures each year, in which a senior leader gives a candid account of their own career and lessons they have learnt about leadership, before a networking dinner.

Methods

To assess the extent to which the Cambridge Masters in Conservation Leadership has met its recruitment, design and impact objectives, we collated quantitative and qualitative data from multiple sources and analysed them during January–October 2020. Most of these sources were initially developed for internal academic monitoring and not explicitly for assessing the long-term effectiveness of the programme, partly because of the lack of a detailed monitoring and evaluation framework when the course was launched. Recruitment statistics, including cohort, age, gender, country of origin, and development assistance status were compiled from course records and donor

reports. Course structure and the organizational affiliation of course lecturers were compiled from course handbooks. Student satisfaction and experience during the course were assessed from quantitative feedback scores given for individual modules and the experiential elements of the programme. These feedback scores used a 0–4 Likert scale, with a score of 4 representing the highest level of satisfaction (see Supplementary Material 1 for an example feedback form). More detailed information on student experience during the degree was drawn from 20-minute exit interviews that were conducted individually with each student in every cohort at the end of the academic year, by the course team. These exit interviews consisted of open-ended questions covering topics such as whether expectations had been met, and specific feedback on key elements of the programme (see Supplementary Material 1 for the full interview schedule). Record keeping has not been complete, and there are some gaps in data across these various methods for certain cohorts.

To investigate the longer-term impact of the Masters on alumni, we designed an online survey that asked respondents to self-assess their leadership attributes and professional responsibilities. We ran a baseline version of the survey that assessed students' career stage and leadership capabilities immediately prior to commencing the course, and then a 5-years post-graduation version of the survey. The latter survey also included additional questions about how alumni rated the contribution of the Masters to their post-graduation professional and personal experience (see Supplementary Material 1 for the full surveys). Each survey was piloted by a few current students and alumni, and required c. 30 minutes to complete. The design of these surveys did not take place until a more structured monitoring and evaluation process was established in 2016, meaning that students who began the degree before that time had to rely on recall to complete the baseline survey. We recognize this as an important limitation. In our statistical analyses, we used Wilcoxon signed-ranks to compare quantitative baseline indicators with the 5-years post-graduation results. All quantitative analysis was done using R 4.0.2 (R Core Team, 2020). Additional quotations on the experience of alumni were drawn from interviews that have been conducted with individual alumni on an ad hoc basis without a standard set of questions. Quotations are presented alongside quantitative results to illustrate key themes.

To gather views on the status and potential future direction of the Masters we carried out consultations during the 2019–2020 academic year with key stakeholders. Fourteen individuals were interviewed, including alumni, conservation NGO staff from CCI organizations, senior university academics, external advisors and course team members. The results were collated and arranged into a strengths, weaknesses, opportunities and constraints table.

It is possible that those providing data through these various sources may have given biased answers. For example, students may have wished to cast the Masters in a positive or negative light for some reason. However, our experience of close interaction with students over the last decade is that they have been willing to share critical feedback to help improve the course. We do, however, think it likely that some alumni were modest in their answers regarding their own conservation impact.

The authors of this study are all current or previous members of the course team that designs and delivers the Masters. This gives us unique insights into the programme that would not be available to an independent evaluator. However, it also creates the possibility of bias in the interpretation and presentation of findings. We acknowledge this risk, and have tried our best to conduct an objective and transparent evaluation of the programme based on the full picture provided by our data. Like all UK higher education degrees, the Masters has received independent quality assurance provided by external examiners, whose contributions have strengthened the programme.

Results

Recruitment of established professionals from under-represented backgrounds

Between 2012–2013 and 2019–2020 the Masters received a total of 595 applications (mean = 74.4 per year); data from the applications cycle for the first two cohorts were not available. From the first year in 2010–2011 to 2019–2020 a total of 181 students (mean = 18.1 per year) were admitted. Data on scholarships were available for all cohorts apart from 2010–2011 and 2012–2013. Of the 152 students in these cohorts 88.9% received a full scholarship, from a range of sources. The proportion of male applicants from 2012–2013 to 2019–2020 was 51.7%, and the proportion among admitted students was 39.6%. The proportion of applicants from developing countries (i.e. Overseas Development Aid recipients according to the Organisation for Economic Cooperation and Development Assistance Committee list) from 2012–2013 to 2019–2020 was 78.2%, and the proportion among admitted students was 70.7%. Up to and including the 2019–2020 cohort, students have been admitted from 80 countries (Fig. 1). The distribution of students by region has varied from year to year, with no clear overall pattern (Supplementary Table 1). The mean age of new students across the five cohorts with complete data available was 32.4 years old (i.e. typically c. 10 years after completion of a first degree or equivalent). Many of the students already had a Masters or had previously graduated from an LL.M, DVM, MBA or PhD degree.

Although exit interviews were conducted for each cohort, we were only able to locate exit-interview data for six

cohorts for this analysis. Analysis of these data revealed that the focus on careful recruitment for the Masters had an impact on student perception of the quality of their experience. In answer to an open question about what was considered the best aspect of the programme, the diversity and experience of the cohort was cited most frequently (48% of 107 responses):

My cohort consisted of 17 people from 16 countries. It was a very diverse group... We learnt so much from each other. We could have a hot debate with no conclusion, but the discussion itself definitely triggered questioning of our own ideals and made us realize the complexities of conservation.

The diversity of the people we had on the course was by far its greatest strength. I learned the importance of acting together as a collective, coming together with our different cultures, backgrounds, perspectives and values and acting together for our shared goals.

Design of course content and delivery

In the period 2014–2015 to 2019–2020 the mean number of seminar sessions in the Masters per year was 77.8, of which 48.6 were taught by practitioners and 29.2 by university academics. Practitioners came from a mean of 15.8 organizations per year, including the core CCI organizations plus others selected for a particular perspective, such as a business or governmental view. Academics came from a mean of 6.2 university departments per year, and a total of 10 University of Cambridge departments have been involved since the degree began. The Cambridge Judge Business School has regularly contributed to a module on innovation, linked to the group consultancy, providing a perspective not usually available to conservation students.

Feedback on the modules was secured from c. 90% of the 181 students in the first 10 cohorts, although the precise figure has not been kept. Analysis suggests that the design of the Masters has been valued and appreciated by students. The mean overall feedback score for each taught module has been > 3.0 out of a possible maximum score of 4 in every year, and > 3.3 in all but 1 year. The mean score for the experiential elements of the degree (the group consultancy and professional placement) have been > 3.3 in every year for which separate scores for these elements have been collected (since 2013–2014), and always higher than the score for the taught modules. As one alumnus noted:

The structure was like no other course I have seen. I liked that there was a mixture of taught components; self-learning components; components where we learned collectively as a group; and also the large component where we were allowed to direct our own project. The placement was particularly good as it wasn't a research project, it was something practical that was going to help a conservation organization in the real world.

Of the 107 responses on exit interviews, 82% reported that overall, the programme either met or exceeded their expectations. Student reflections revealed a diversity of ways in



FIG. 1 The origin of all 181 Cambridge Masters in Conservation Leadership students from 2010–2011 to 2019–2020, with the shade indicating the number of students from each country.

which the programme was able to deliver a rewarding learning experience:

Yes it has... surpassed expectations. Networking and social activities and professionals delivering lecturers—I didn't expect that, and it meant the course was unique.

Yes—and it has gone beyond them. It has opened my mind. I learned how to see things from multiple perspectives. I have really enjoyed interdisciplinary aspects of the programme.

More critical perspectives from some students and alumni identified concerns over the intensity of the course, particularly the large number of written assignments students are required to complete. There have also been concerns about the perceived lack of diversity amongst the teaching staff, which is primarily drawn from CCI organizations, which are dominated by British nationals with expertise in the NGO sector, often in the UK or Africa.

Impact on alumni and conservation

Data from 107 exit interviews indicated that 86% of students felt the programme had led to a change in their career goals or in their perception of their ability to achieve their career goals. In this regard, 51%, unprompted, articulated a specific career goal arising from their participation in the Masters, and 46%, unprompted, indicated an improvement in their soft skills such as networking or confidence. Among the 79 students who made up the four cohorts since 2015 who were provided with formal professional mentors, 75% reported an experience of mentoring that they rated as good or higher.

Of the four cohorts eligible to participate in the 5-years post-graduation survey, 34 alumni from the 2010–2011 to

2013–2014 cohorts completed both the baseline survey and the 5-years post-graduation survey, facilitating comparison of results (a response rate of 53% of the 64 students in these cohorts). Compared to their baseline scores, alumni 5 years after graduation reported a higher total score for both their self-assessed leadership attributes (Wilcoxon signed-ranks test, $N = 24$, $V = 8.5$, $P < 0.001$) and their professional responsibilities (Wilcoxon signed-ranks test, $N = 27$, $V = 49$, $P = 0.007$; Fig. 2). There was no relationship between change in leadership and responsibility scores on the one hand and the gender of students or the development status of their home country on the other. One alumnus noted:

It has provided me with a toolkit (strategy, bigger picture, communication, advocacy, confidence) to develop and lead conservation projects, as well as interact with stakeholders that are involved in those projects.

Alumni believed the Masters had made a positive contribution to their current leadership abilities (mean score = 4.6 out of 5), their career development since graduating (mean score = 4.7 out of 5) and on them personally, outside their professional career (mean score = 4.8 out of 5). Alumni felt their careers would have progressed more slowly had they not completed the Masters (mean score = 4.0 out of 5). Before beginning the degree, 81% of respondents had a paid job in conservation and 16% had an international element to their work in conservation. This had risen to 94% and 39%, respectively, 5 years after graduating. Although some alumni reported a change in seniority in their roles in the 5 years since graduating, for the group as a whole this was not significant (mean for seniority had risen from 3.0 (senior officer/manager) to 3.16 (between senior officer/manager and head of a group/programme)

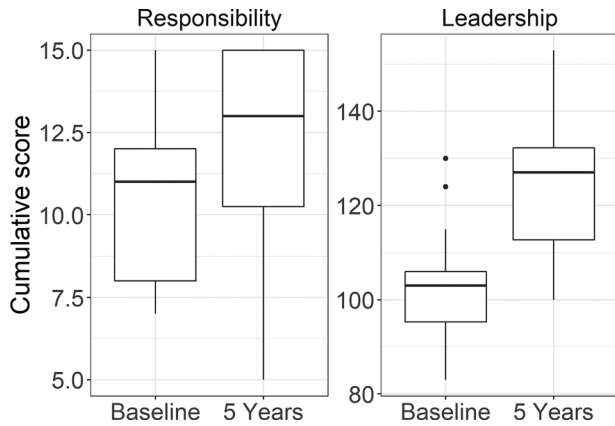


Fig. 2 Box plots showing the change in cumulative responsibility and leadership self-assessment scores between the baseline survey and the 5-years post-graduation survey (note the different y-axis scales). Boxes represent 25th–75th percentile, horizontal lines the median, and whiskers the data range except for outliers, which are shown as dots.

on a scale rising to 6 (chief executive officer or equivalent); Wilcoxon signed-rank test, $V = 8$, $P = 0.1521$). Two alumni noted:

[The Masters] allowed me to reinvent myself and use what I learned to create a new project based on what I was passionate about. It gave purpose to my life but at the same time was strategic and down to earth in terms of conservation impact.

It was the most profound experience I’ve ever had in my life, the confidence it built in me around what I could achieve in life. On leaving Cambridge I secured a managerial role overseeing a team, and over 100 projects with USD 6 million budgets, somewhere I never thought I’d be, but the course and the support of the network empowered me to get there.

Alumni 5 years after graduating reported a significantly higher level of impact on the wider systems within which they work and across all combined dimensions of impact compared to the baseline survey (Table 1). Although scores for impact on people, organizations and overall conservation success also increased, these changes were not significant (Table 1). In the 5-years post-graduation survey, 80% of alumni felt they had achieved impact through the skills they learned during the Masters, 70% through

the personal characteristics they developed, and 55% by passing on what they learned in the Masters to others. Two alumni noted:

Knowledge acquired through the [Masters] course has been useful in managing teams, developing organizational and programme level strategies, talent management, change management, financial management, fundraising and stakeholder management. Overall the course enhanced my capacity to be a leader as opposed to a manager. This is evident in the position I have held over the past 2 years where our performance has significantly improved.

I think it is hard to ‘evaluate’ your conservation success.

Consultation on future direction

Key themes emerging from the stakeholder consultation on the future direction of the Masters are summarized as strengths, weaknesses, opportunities and constraints (Table 2). These included many of the same positive aspects reported by students and alumni, but also raised concerns about who was able to access an intensive 1-year residential programme and how much impact could be generated from a programme training 20 students per year.

Discussion

Ten years after its establishment, the Cambridge Masters in Conservation Leadership has broadly achieved its goals in terms of student recruitment and course design, and its alumni show signs of having enhanced long-term conservation impact. There are various lessons to be learnt.

Bringing together groups of experienced and diverse conservationists for an intensive in-person experience has created fertile opportunities for peer learning and personal growth. This confirms the findings of previous research showing that cohort bonding is central to student satisfaction and engagement (Martin et al., 2017) and is consistent with the results of a study of the conservation leadership capacity landscape (Bruyere et al., 2020). Within the Masters, cohort bonding among students is encouraged by holding a residential field trip in the first week of the programme, having all classes undertaken together, with no

TABLE 1 The self-assessed impact scores of students before beginning the course and 5 years after graduating, and analysis of any difference.

Variable	Baseline mean score (N)	Mean score 5 years after graduation (N)	Wilcoxon signed-rank test of difference (P)
Impact on people (scale 0–4)	2.588 (34)	2.724 (34)	77.5 (0.158)
Impact on organizations (scale 0–4)	2.400 (35)	2.725 (35)	69.0 (0.094)
Impact on wider systems (scale 0–4)	1.771 (35)	2.400 (35)	79.5 (0.003**)
Impact on conservation success (scale 0–4)	1.886 (35)	2.077 (35)	150.0 (0.506)
Combined impact score (scale 0–16)	8.765 (34)	9.846 (34)	124.5 (0.015*)

* $P < 0.05$; ** $P < 0.01$.

TABLE 2 Strengths, weaknesses, opportunities and constraints analysis for the Masters in Conservation Leadership, carried out through interviews with 14 key stakeholders (see text for details).

Strengths	Weaknesses
Programme content (focus on applied leadership & management & inter-disciplinary academic conservation topics)	Course is intense for students, with a heavy load of classes & assessments; limited time for self-reflection & wider reading
Experiential learning through group consultancies, professional placements, 1:1 mentoring & hands-on exercises (such as networking & advocacy)	Location in UK & partnership with CCI organizations gives a somewhat UK-, avian-, & NGO-centric perspective on conservation
University of Cambridge expertise & brand	A lack of diversity in the course contributors
Global alumni network of mid-career conservation leaders who are now organized & beginning to mobilize	One year is insufficient to cover all aspects of conservation leadership in sufficient depth. Inevitably some topics not covered
Support of Cambridge Conservation Initiative organizations for programme delivery	Difficult to recruit students who cannot leave their professional or personal context for a full year
Cohort size of c. 20, which facilitates strong bonding & personal attention to each student	Many outstanding future leaders do not meet the language & academic requirements to enrol at the University of Cambridge, even with some flexibility to recognize professional achievements
Diversity of students in terms of nationality, career stage & sectoral background	Some alumni find it difficult to transition back to their home context; feelings of isolation & lack of recognition from their organizations
Donor support enabling provision of scholarships & additional resources for students	
Value added to CCI as an exemplar of what can be achieved by working in collaboration	
Students deliver useful input to organizations through project work A strong course team to support development & delivery of the programme	
Opportunities	Constraints
Highly engaged alumni who are willing to work together on new projects; they can speak & act with authority	Need to work within the university system in terms of programme design & time taken to implement any changes
Availability of diverse potential new course contributors, including alumni & those from other sectors	Challenge of working with alumni who are distributed across 80 countries
Online meeting and conferencing software now available that makes location no barrier to delivering or receiving content for the Masters	Limited research on conservation leadership to guide programme design & delivery
Emerging network of conservation leadership capacity developers willing to share experiences & work together to improve practice	Lack of permanent programme endowment limits long-term planning
CCI organizations & alumni willing to host internships for recent graduates	Limited scalability to large numbers of students because of the target cohort size of c. 20 students per year
Lessons learnt during COVID-19 pandemic could be used to develop online content & webinars for students & alumni	Course model is dependent on global travel; this generates carbon emissions & vulnerability to global pandemics
Global conservation leaders passing through the David Attenborough Building & willing to meet students & contribute	

elective modules, and including a group consultancy project and various social and networking events.

The quality of the cohort experience has been partly a function of the diverse backgrounds of the students. Achieving such diversity is challenging, as few conservation professionals have the resources to afford a Masters degree at a UK university, particularly those working in the Global South. The Masters and its students have been fortunate in attracting support from donors and grant-awarding bodies. We encourage donors and universities to prioritize financial support for students from a diversity of backgrounds and countries to attend similar courses. Such support not only enhances leadership capacity where it is needed, but also improves the learning environment for all students participating in a programme.

It is striking that the gender ratio among applicants to the Cambridge Masters has been approximately balanced, yet female students have comprised > 60% of those admitted. Candidate scores from the admissions process were not archived, so we could not investigate underlying explanations for this pattern. Nonetheless, our personal experience of the admissions process is that female applicants have provided, on average, a stronger written application and have performed particularly well at interviews. There are at least two plausible explanations, which are not mutually exclusive. Firstly, this could suggest the arrival of a new generation of female conservation leaders who will help to redress historical gender biases in conservation leadership. Secondly, it is possible that excellent male conservationists do not feel the need to obtain a Masters, but excellent female conservationists are unable to fulfil their career aspirations without the benefit of further training and qualifications as a result of the persistence of so-called glass ceilings that unfairly prevent progression. Recent research suggests that such barriers remain commonplace, at least in the USA (Jones & Solomon, 2019).

The course design emphasizes experiential learning, practitioner-led teaching, mentoring, leadership and management. These characteristics were valued by the students and raised their leadership capabilities. The group consultancy and professional placement elements were valued most highly by students, as also reported by Bruyere et al. (2020) who found that 'experiential and applied learning... are highly effective approaches for knowledge development and interaction'. Being embedded in the David Attenborough Building with a network of conservation organizations has been of value for students, who get to work with practitioners throughout the year, and particularly in the professional placement, allowing students to use their leadership training as a lens to interrogate their understanding of organizational structures, power, management and decision-making both within the organization and team in which they are placed. This is made possible by the long-term relationships between the course and partner

organizations. We encourage other programmes to foster such connections wherever possible.

Feedback on mentoring was positive, but not universally so. In most cases students had a positive mentoring experience, but in a few cases students were less satisfied or even disappointed. The variable outcomes of the mentoring programme were probably a result of it having to take place on an accelerated schedule within a 1-year programme, leading to some mentor/mentee mismatches. To improve the mentoring scheme we have now introduced formal orientation sessions for the professional mentors and students, to align expectations more closely. In the future, as part of this, we intend to ask students to write a non-assessed personal career plan, which will be discussed with the professional mentor.

Our study identified signs of positive career progression amongst alumni, and that they considered the Masters to be an important contributing factor. Although not an explicit target of the course, the proportion in international roles had more than doubled 5 years after graduating. This is probably a result of the international exposure provided by the course content and the high proportion of international students in each cohort. Increased international mobility can be seen as a positive outcome, with top quality leaders moving into international positions, or this mobility could be seen as negative, resulting in a drain of capable persons from students' home countries. We are comfortable with the current proportion of alumni in international roles (39%) but would become concerned if it increased beyond 50%. Although the proportion of alumni employed in conservation was greater than prior to the course, c. 5% were not currently employed in the sector after 5 years. For some this was because of a career break with family, but not in every case. Even with considerable investment of time and resources, some alumni will choose new pathways for their careers.

Increases in self-assessed impact among alumni were less dramatic than perceived increases in leadership capabilities or professional responsibilities. This could be for two reasons. Firstly, individuals with increased capacity may find it difficult to convert their abilities into significant conservation impact without ongoing support, something previously suggested elsewhere (Sawrey et al., 2019). This is supported by the point relating to the challenge of transitioning back to the workplace in the strengths, weaknesses, opportunities and constraints analysis (Table 2). This argues for treating capacity development as an ongoing process, rather than as something that ends on the day of graduation. Secondly, it may be that limitations to our methods or sample size did not allow actual impact to be identified. The sample size of respondents in both surveys was low, as might be expected in an early analysis of a young programme; the baseline survey data relied on recall, which may not have been accurate; and in some cases alumni

may have under-rated their impact because of humility or a lack of certainty.

Some of these issues came about because the Masters did not initially have a clear theory of change or a pre-designed monitoring and evaluation framework. This supports the conclusion of Bruyere et al. (2020) that rigorous evaluation of outcomes is an area in which conservation leadership capacity programmes have often been wanting. We agree with Bruyere et al. (2020) that strengthening monitoring and evaluation should be a priority for all such programmes. One innovation we intend to test is to ask incoming students to identify a pre-existing professional mentor who would provide an assessment of the student's leadership qualities before and after the course, to facilitate a more independent evaluation of course impact. This approach has some similarities to an approach tested successfully in a private sector leadership training context (Packard & Jones, 2015).

The strengths, weaknesses, opportunities and constraints analysis on the future of the Masters identified several additional points. Some related to difficulties in accessing the course for potential students, linked to cost, qualifications, location, duration and limited cohort size. Although efforts have been made to minimize these barriers, they cannot be fully removed. This calls for the development of further programmes to meet demand, particularly at the regional level where programmes can be tailored for local circumstances, costs kept low and part-time study made available. Based on our experience of online engagement during the COVID-19 pandemic, it may also be more feasible than previously envisaged to deliver effective online training in conservation leadership. This opens up the potential to reach a greater numbers of students, and could be delivered at zero cost to them if funding to cover running costs could be sourced. A tiered approach could be effective, in which emerging leaders take a free online course, followed by an in-person course in their region and/or a global programme such as the Masters.

Conclusions

Conservation leadership capacity development is crucial for the future success of the conservation movement. The Cambridge Masters in Conservation Leadership has demonstrated the value of recruiting experienced and diverse conservationists, focusing on applied issues of leadership and management, and incorporating practitioner-led and experiential learning. Early evidence of longer-term impacts is encouraging, but not yet compelling. We plan to track these data to provide a clearer picture over the next decade.

Based on the results presented here, and wider programme learning, we have developed a new 2020–2030 strategy for the Masters. Firstly, we will make reforms

to the course, including introducing a clearer module structure, diversifying the teaching staff and introducing a wider range of practical, non-written modes of assessment. We will also investigate launching a freely available online programme, to enhance access.

Secondly, we agree with Bruyere et al. (2020) that the long-term impact of alumni would be enhanced by providing ongoing support. To this end we have established the University of Cambridge Conservation Leadership Alumni Network. It has regional groups that meet regularly, an elected global council to provide strategic direction, and has carried out collective activities such as submitting proposals to the CBD post-2020 process and publishing an editorial in *Oryx* (Ngwenya et al., 2020). We will continue to support the Network by allocating increased staff time, providing small grants for alumni projects, and promoting mentoring and regional activities.

Finally, no single training programme can meet the need for conservation leadership capacity development alone. We welcome the growing number of programmes in this field. Approximately 20 such programmes have already formed the New Directions in Conservation Leadership network (Corrigan et al., 2020), and we hope this will become a flourishing community of practice.

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Author contributions Monitoring protocol design: CS, NL-W; data collation and analysis, writing: all authors.

Conflicts of interest All authors are, or have been, directly involved in the management of the Masters in Conservation Leadership.

Ethical standards Ethical approval for this research was granted by the University of Cambridge Department of Geography ethical review board on 3 November 2020. This was retrospective, because the data were initially collected for internal course evaluation rather than for published research. Nonetheless, standard ethical procedures for consent, confidentiality and data management were adhered to and the publication of anonymous results does not contravene any assurances given to respondents at the time data were collected. This research otherwise abided by the *Oryx* guidelines on ethical standards.

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